BLUSTREAM MULTICAST
ACM500 - Advanced Control Module

UPGRADE   RESET

⏻

12V ⎓ 1A   VIDEO LAN (PoE)   CONTROL LAN   RS-232 1   RS-232 2   IO1 IO2 IO3 IO4   VOUT   IO LEVEL   IR   ACM500

PoE   DATA   TX RX   TX RX   IO LEVEL 5V 12V   IR CTRL   5V 12V   ACM

▶ # Blustream Multicast

ACM500 - Advanced Control Module
For use with IP500UHD Systems
User Manual

BLUSTREAM MULTICAST

Thank you for purchasing this Blustream product

For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems are highly recommended in order to protect and extend the life of your equipment.

Safety and performance notice

Do not substitute or use any other power supply other than approved PoE network products or approved Blustream power supplies.

Do not disassemble the ACM500 unit for any reason. Doing so will void the manufacturer's warranty.

Contents

Introduction

Our UHD SDVoE Multicast platform allows distribution of the highest quality, uncompromised 4K with zero latency Audio/Video over copper or optical fibre 10GbE networks.

The ACM500 Control Module features advanced third party integration of the SDVoE 10GbE Multicast system using TCP/IP, RS-232 and IR. The ACM500 includes a web interface module for control and configuration of the Multicast system and features 'drag and drop' source selection with video preview and independent routing of IR, RS-232, USB / KVM, Audio and Video. Pre-built Blustream product drivers simplify Multicast product installation and negate the need for an understanding of complex network infrastructures.

Features

- Web interface module for configuration and control of the Blustream SDVoE 10GbE Multicast system

- Intuitive 'drag & drop' source selection with video preview feature for active monitoring of system status

- Advanced signal management for independent routing of IR, RS-232, CEC, USB/KVM, audio and video

- Auto system configuration

- 2 x RJ45 LAN connections to bridge existing network to Multicast video distribution network, resulting in:

    - Better system performance as network traffic is separated

    - No advanced network setup required

    - Independent IP address per LAN connection

    - Allows simplified TCP / IP control of Multicast system

- Dual RS-232 ports for control of the Multicast system or pass-through of control to remote third party devices

- 5V / 12V IR integration for control of Multicast system

- PoE (Power over Ethernet) to power Blustream product from PoE switch

- Local 12V power supply (optional) should Ethernet switch not support PoE

- Support for iOS and Android App control (coming soon)

- 3rd party drivers available for all major control brands

Impotant Note:

The Blustream Multicast system distributes HDMI video over Layer 3 managed network hardware. It is advised that Blustream Multicast products are connected on an independent network switch to prevent unnecessary interference, or reduction in signal performance due to other network products bandwidth requirements.

Please read and understand the instructions in this manual and ensure that the network switch is configured correctly prior to connecting any Blustream Multicast products. Failure to do so will result in problems with configuration of the system and video performance.

Panel Description - ACM500 Advanced Control Module
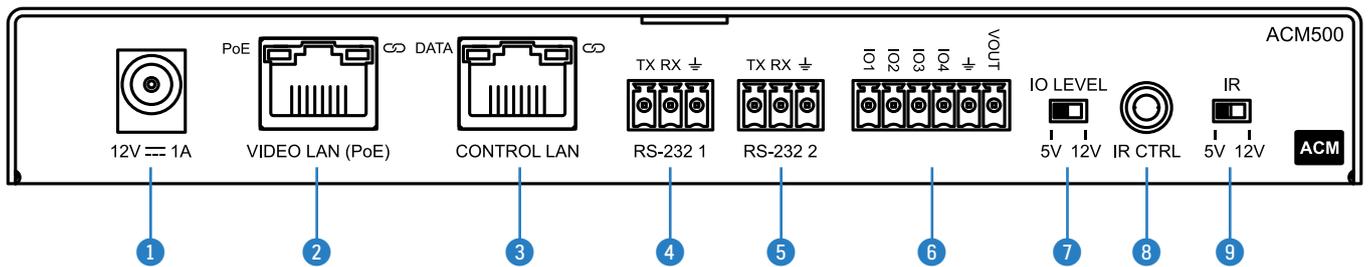
❶ Power Connection (optional) - use 12V 1A DC power supply where the video LAN switch does not provide PoE

❷ Video LAN (PoE) - connect to the network switch that the Blustream Multicast components are connected to

❸ Control LAN Port - connect to existing network that a third party control system resides on. The Control LAN port is used for Telnet/IP control of the Multicast system. Not PoE.

❹ RS-232 1 Control Port – connect to a third party control device for control of the Multicast system using RS-232

❺ RS-232 2 Control Port – connect to a third party control device for control or serial control pass-through of the Multi-cast system using RS-232

❻ GPIO Connections - 6-pin Phoenix connect for input / output triggers (reserved for future use)

❼ GPIO Voltage Level Switch (reserved for future use)

❽ IR Ctrl (IR Input) – 3.5mm stereo jack. Connect to third party control system if using IR as the chosen method of controlling the Multicast system. When using the included 3.5mm stereo to mono cable, ensure the cable direction is correct

❾ IR Voltage Selection - adjust IR voltage level between 5V or 12V input for IR CTRL connection

ACM500 Control Ports

The ACM500 communication ports are located on rear of the unit and include the following connections:
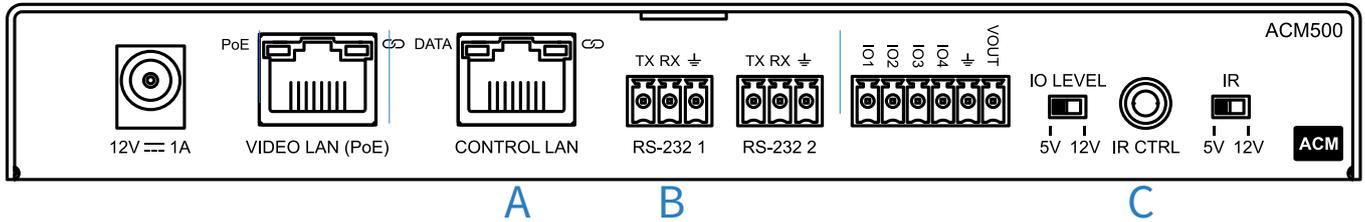
Connections:

A. TCP/IP – for full Multicast system control (RJ45 connector)

B. RS-232 – for full Multicast system control / RS-232 guest mode (3-pin Phoenix)

C. Infrared (IR) Input - 3.5mm stereo jack - for Multicast switching control only

Please note: the ACM500 can be used with both 5V and 12V IR line systems. Please ensure that the switch (adjacent to the IR port) is correctly selected to the specification of the IR line input.

TCP/IP:

The Blustream ACM500 can be controlled via TCP/IP.

For the full list of protocols please see 'RS-232 & Telnet Commands' located towards the rear of this manual.

A 'straight-through' RJ45 patch lead should be used when connected to a network switch.

> Control Port: 23
> Default IP: 192.168.0.225
> Default Username: blustream
> Default Password: 1 2 3 4

RS-232:

The Blustream ACM500 can be controlled via serial using the serial 3-pin Phoenix connector. Default settings below:

For the full list of command protocols please see 'RS-232 & Telnet Commands' located at towards rear of this manual.

> Baud Rate: 57600
> Data Bit: 8-bit
> Parity: None
> Stop Bit: 1-bit
> Flow Control: None

The Baudrate for the ACM500 can be adjusted using the ACM500 built-in web-GUI, or by issuing the following command via RS-232 or Telnet:

RSB x : Set RS-232 Baud Rate to *X* bps

> Where *X* =   0 : 115200
> 1 : 57600
> 2 : 38400
> 3 : 19200
> 4 : 9600

ACM500 Control Ports - IR Control

The Multicast system can be controlled using local IR control from a third party control system. Source selection is the only feature available when using local IR control - advanced features of the ACM500 such as video wall mode, audio embedding etc. can only be achieved using RS-232 or TCP/IP control.

Blustream have created 16x input & 16x output IR commands allowing source selection of up to 16x IP500UHD-TZ's in Transmitter mode on up to 16x IP500UHD-TZ's in Receiver mode. For systems larger than 16x inputs or outputs, RS-232 or TCP/IP control will be required.

**Third Party Control System**
(source selection only)
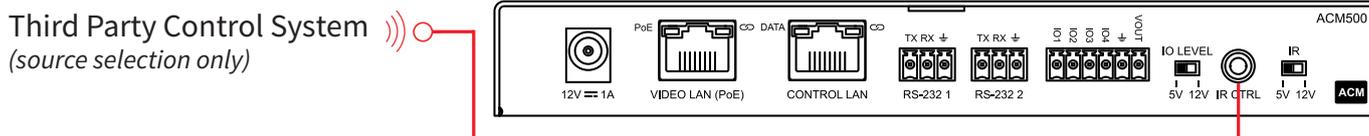
The ACM500 is compatible with both 5V and 12V IR equipment. When the ACM500 is being used to receive an IR input into the IR CTRL port, the adjacent switch must be toggled correctly to suit the IR voltage line of the chosen control system before connection.

Please note: Blustream IR cabling is all 5V

IR Emitter - IER1 & IRE2 (IRE2 sold separately)

Blustream 5V IR Emitter designed for discrete IR control of hardware
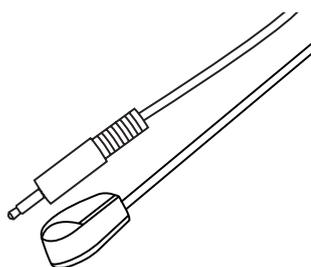
Infrared 3.5mm Pin-Out

IR Emitter - Mono 3.5mm
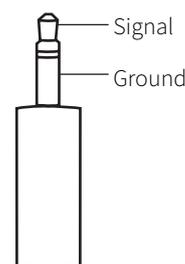
Signal
Ground

IR Receiver - IRR

Blustream 5V IR receiver to receive IR signal and distribute through Blustream products
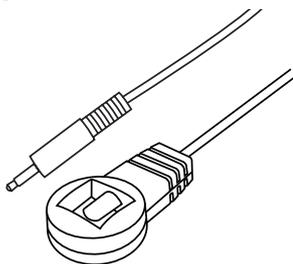
IR Receiver - Stereo 3.5mm

Signal
5V
Ground
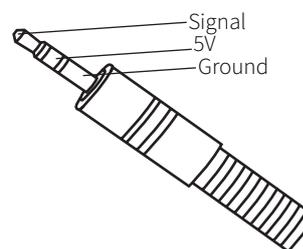
IR Control Cable - IRCAB (sold separately)

Blustream IR Control cable 3.5mm Mono to 3.5mm Stereo for linking third party control solutions to Blustream products.

Compatible with 12V IR third party products.

Please note: cable is directional as indicated
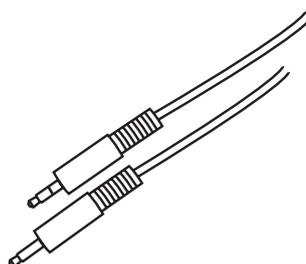
ACM500 Network Connection

The ACM500 acts as a bridge between the control network and video network to ensure that the data travelling between the two networks are not mixed. The ACM500 must be connected via CAT cable up to 100m in length in accordance with typical networking requirements.

Example Schematic
ACM500

10 GBase – T LAN
SFP+ Fibre Connection
IR
LAN
RS-232
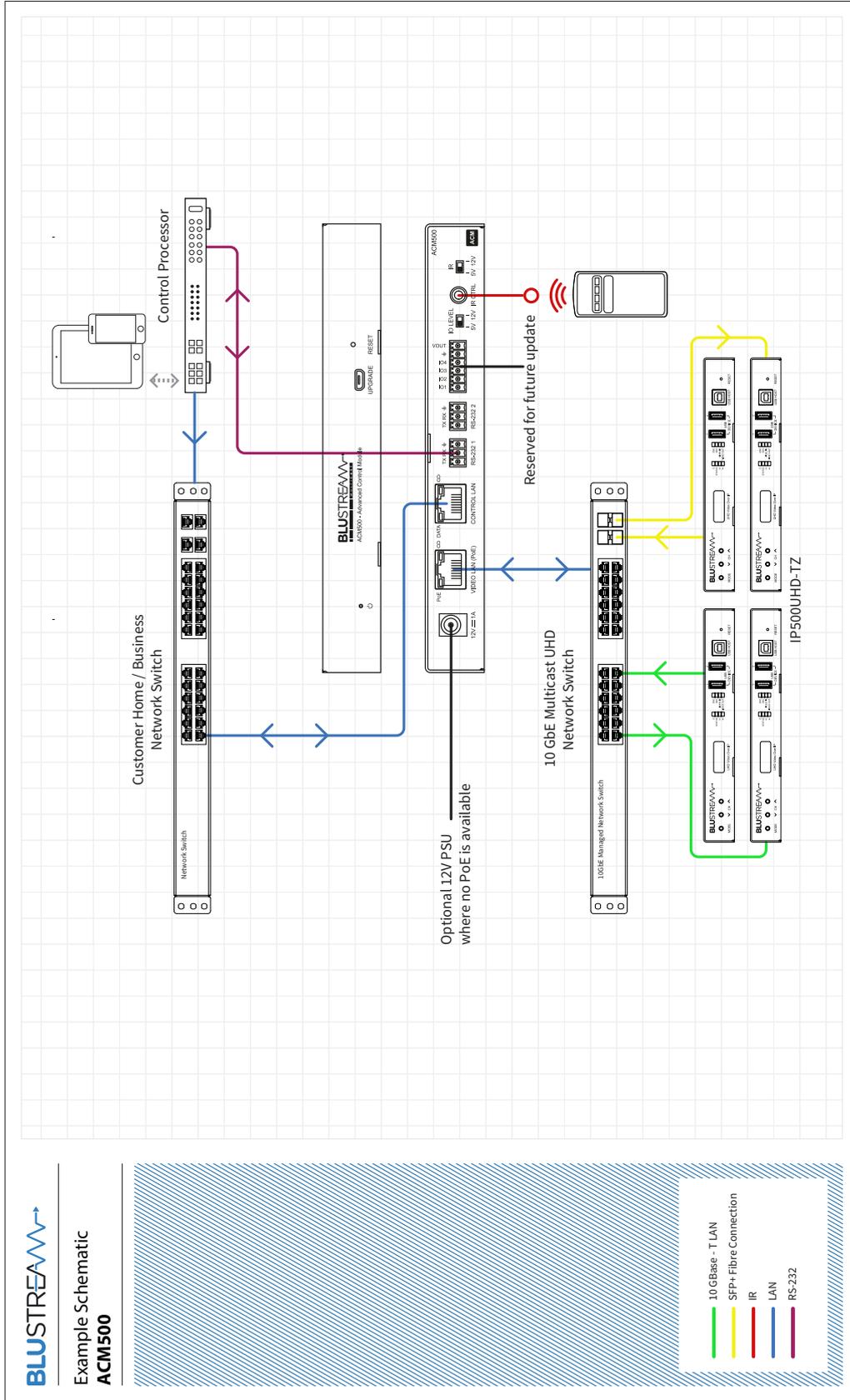
Web-GUI Guide

The web-GUI of the ACM500 allows for full configuration of a new system, as well as on-going maintenance and control of an existing system through a web portal. The ACM500 can be accessed on any network connected device including: tablets, smart phones and laptops that are on the same network.

Sign In / Log In

Before logging in to the ACM500, ensure that the control device (i.e. laptop / tablet) is connected to the same network as the ACM500's Control Port. There are instructions of how to amend the static IP address of a PC at the rear of this manual.

To log in, open a web browser (i.e. Firefox, Internet Explorer etc.) and navigate to the default static IP address of the ACM500 which is:

<div align="center">

192.168.0.225

</div>

Please note: the ACM500 is shipped with a static IP address, and is not DHCP.
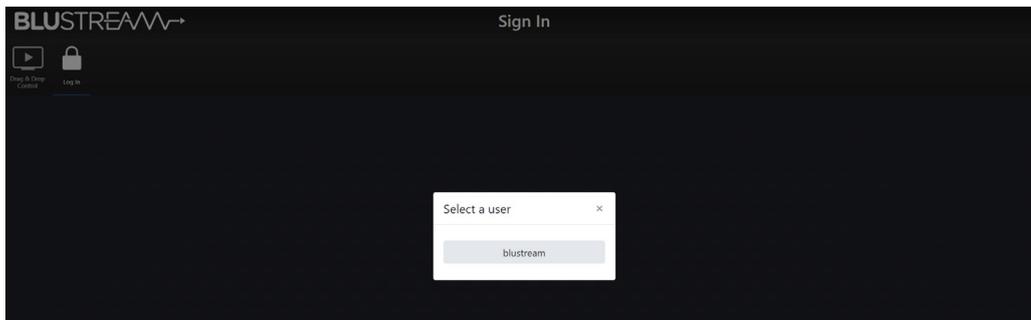
The sign in page is presented on connection to the ACM500. Once Users have been created within the system, this screen will be populated with the Users previously configured for future log ins. The default admin PIN is:

<div align="center">

1 2 3 4

</div>

Please note: The first time you log in to the device you will be asked to update the password. Please record this password as it is non-recoverable and you may need to factory reset the device in case of a lost password.
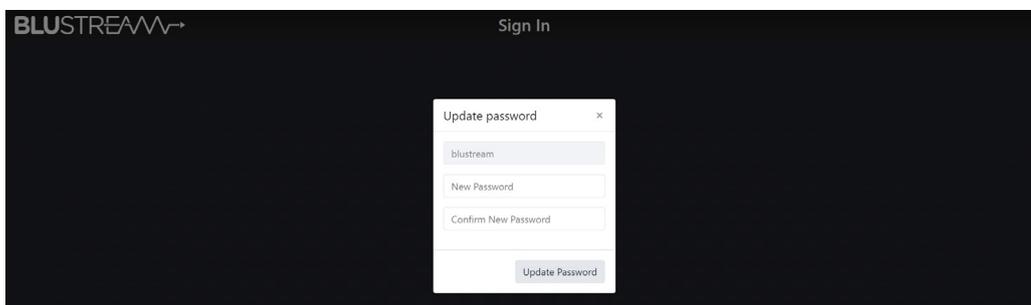
New Project Set-up Wizard

On first log in of the ACM500, a Set-up Wizard for configuring all components of the Multicast system will be presented. This has been designed to speed up new system configuration as all default / new Multicast Transmitters & Receivers can be connected to the network switch at the same time, whilst not resulting in an IP conflict during the system configuration. This results in a system in which all components are automatically, and sequentially, assigned a name and IP address ready for basic system use.
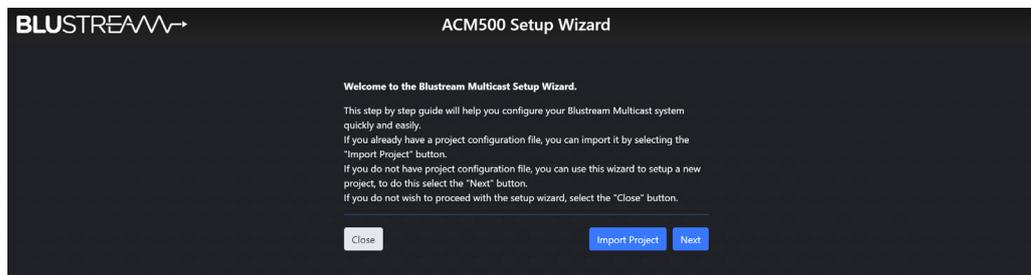
The ACM500 Set-up Wizard can be cancelled by clicking 'Close'. Please be aware that the system will not be configured at this point, but can be continued by visiting the 'Project' menu. If a project file is already available (i.e. replacing an ACM500 on an existing site), this can be imported by using the export .json file by clicking 'Import Project'.

Click 'Next' to continue set-up:
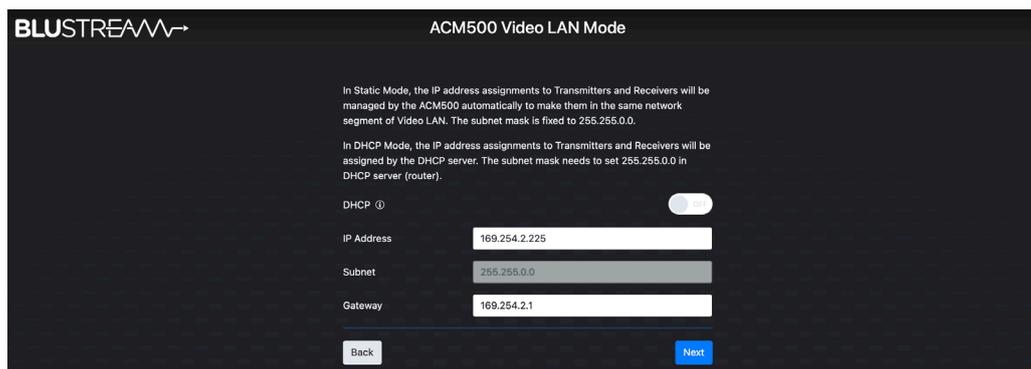
By default, the ACM500 will assign the IP500UHD-TZ IP addresses based on the rules outlined on the next page. Where the IP addresses need to be assigned from a DHCP server, the IP address of the Video LAN port can be adjusted from this page to suit the system.

Please note: when allowing a DHCP server the ability to assign IP addresses, ensure that the Subnet is set to 255.255.0.0 to ensure all of the TX / RX modules can be found, and subsequently communicate with eachother.

Click 'Next' to continue

New Project Set-up Wizard - continued...

If at this point the Network Switch is not configured for use with the Blustream Multicast system, click on the hyperlink 'network switch setup guides' to navigate to a centralised webpage containing common Network Switch Guides.

An example schematic diagram for the connections of the ACM500 can be accessed by clicking the hyperlink marked 'diagram'. This will ensure the ACM500 is connected correctly to the wider Multicast system before the Wizard begins. Once the connections of the ACM500, are confirmed click 'Next'. Connection diagram is on page 07 of this guide.
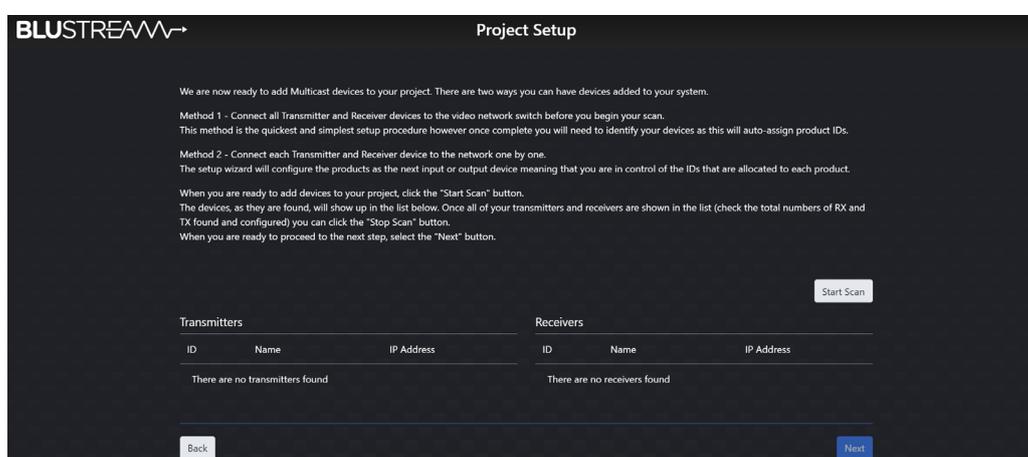
The IP500UHD-TZ is shipped by default in Encoder (TX) mode. Where a Decoder (Receiver) is required, press and hold the Mode button on the unit before searching for the unit in the ACM500 GUI. There are 2 methods for adding new Transmitter and Receiver devices to a system, choose one before clicking 'Start Scan':

Method 1: connect ALL Blustream Multicast Transmitter and Receiver units to the network switch. This method will quickly configure all devices with their own individual IP addresses based on the following:

> **Transmitters:** The first Transmitter will be given the IP address of 169.254.3.1. The next Transmitter will be assigned an IP address of 169.254.3.2 and so on....
>
> Once the IP range of 169.254.3.x is filled (254 units), the software will auto assign an IP address of 169.254.4.1 and so on...
>
> Once the IP range of 169.254.4.x is filled the software will auto assign an IP address of 169.254.5.1 and so on until 169.254.4.254
>
> **Receivers:** The first Receiver will be given the IP address of 169.254.6.1. The next Receiver will be assigned an IP address of 169.254.6.2 and so on....
>
> Once the IP range of 169.254.6.x is filled (254 units) the software will auto assign an IP address of 169.254.7.1 and so on...
>
> Once the IP range of 169.254.7.x is filled the software will auto assign an IP address of 169.254.8.1 and so on until 169.254.8.254

Once complete, devices will need to be identified manually - this method will auto-assign product IP addresses and ID's to each device connected to the network switch randomly (not by switch port).

Method 2: connect each Multicast Transmitter and Receiver to the network one-by-one. The Set-up Wizard will configure the units sequentially as they are connected / found. This method allows for the control of the sequential assigning of IP addresses and ID's of each product - the Transmitter / Receiver units can be labelled accordingly.

New Project Set-up Wizard - continued...

Once the set-up method to configure the system has been chosen, hit the 'Start Scan' button.

The ACM500 will search for new Blustream Multicast units on the network, and will continue to search for new devices until such time as:

- The 'Stop Scan' button is pressed
- The 'Next' button is clicked to progress the Set-up Wizard after all units have been found

Project Setup

We are now ready to add Multicast devices to your project. There are two ways you can have devices added to your system.

Method 1 - Connect all Transmitter and Receiver devices to the video network switch before you begin your scan.
This method is the quickest and simplest setup procedure however once complete you will need to identify your devices as this will auto-assign product IDs.

Method 2 - Connect each Transmitter and Receiver device to the network one by one.
The setup wizard will configure the products as the next input or output device meaning that you are in control of the IDs that are allocated to each product.

When you are ready to add devices to your project, click the "Start Scan" button.
The devices, as they are found, will show up in the list below. Once all of your transmitters and receivers are shown in the list (check the total numbers of RX and TX found and configured) you can click the "Stop Scan" button.
When you are ready to proceed to the next step, select the "Next" button.

Stop Scan

| Transmitters			Receivers		
ID	Name	IP Address	ID	Name	IP Address
1	TX1	169.254.3.1	1	RX1	169.254.6.1

As new units are found by the ACM500, the units will populate to the relevant columns marked Transmitters or Receivers. It is recommended to label the individual units at this point. The new IP address of the units will be displayed on the front panel of the products.

Once all units have been found and configured, click 'Stop Scan', then 'Next'.

# New Project Set-up Wizard - continued...

The Device Set-up page allows for Transmitters and Receivers to be named accordingly. EDID and Scaler settings for the individual Transmitters or Receivers can be set as required. For help with EDID and Scaler settings, click the relevant buttons marked 'EDID Help' or 'Scaling Help', refer to page 24.
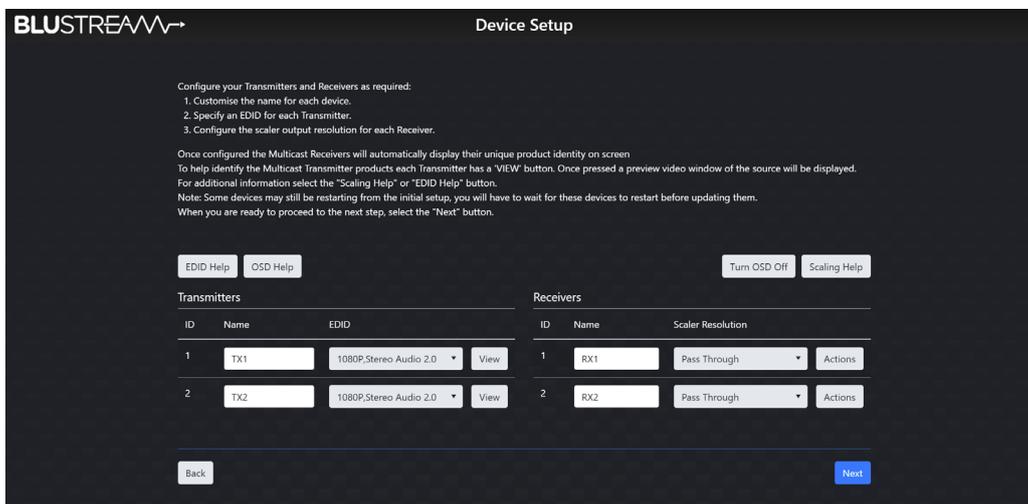
Features of the Device Set-up page include:

1. **Name of Devices** - during configuration the Transmitters / Receivers are automatically assigned default names i.e. Transmitter 001 etc. Transmitter / Receiver names can be amended by typing in the corresponding box.

2. **EDID** - fix the EDID value for each Transmitter (source). This is used to request specific video and audio resolutions for the source device to output. Basic help with EDID selection can be obtained by clicking the button marked 'EDID Help'. See page 19 for a full list of EDID settings that can be applied.

3. **View** - opens the following pop-up:
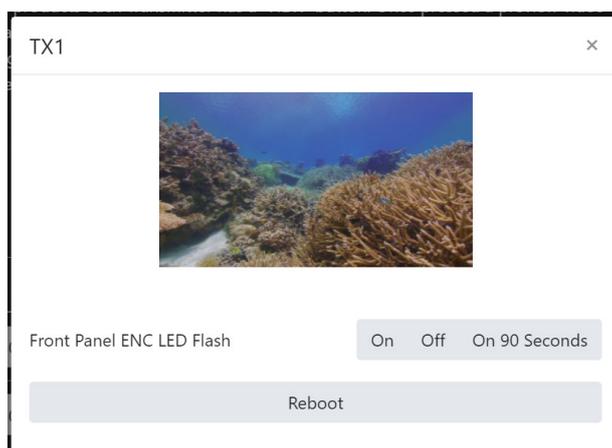
This pop-up shows an image preview of the media currently being streamed by the Transmitter unit. The ability to identify the unit by flashing the front panel LED's on the unit, and the ability to Reboot the unit.

New Project Set-up Wizard - continued...

4. Scaler - adjust the output resolution using the built-in video scaler of the Multicast Receiver. The scaler is capable of both upscaling and downscaling the incoming video signal. See page 22 for a full list of Scaler output settings that can be applied.

5. Refresh - click here to refresh all current information on the products within the system.

**6. Actions** - opens the following pop-up:
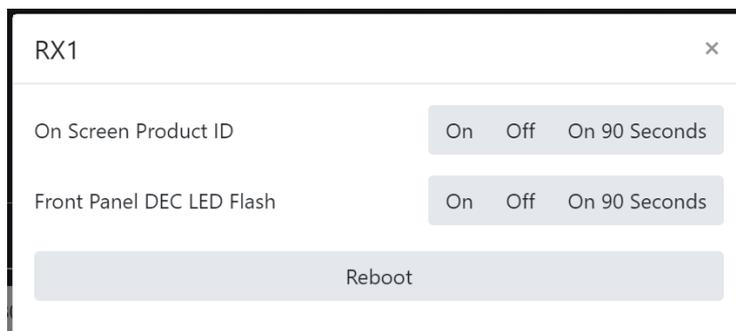
This pop-up gives you the ability to display the product ID on the connected screen / display by way of an OSD (On Screen Display) as an overlay to the media being accepted the by Receiver. The ability to identify the unit by flashing the front panel LED's, and the ability to Reboot the unit is contained here.

7. Turn OSD On / Off - toggles the product ID onto the connected screen / display by way of an OSD.
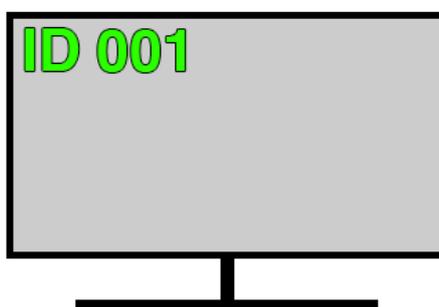
8. Next - continues to the Set-up Wizard Completion page
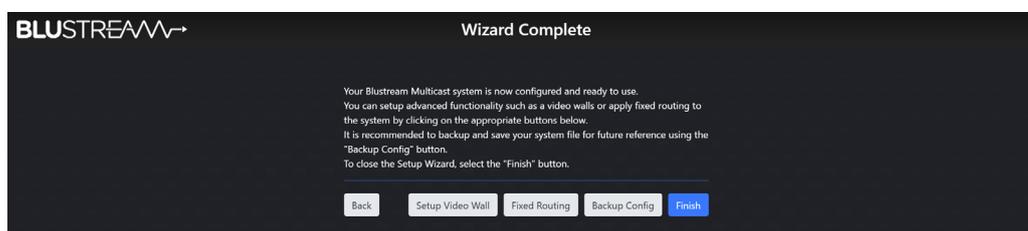
The Wizard Completion page finalises the basic configuration process and provides links for advanced set-up options for Video Walls, Fixed Signal Routing (IR, RS-232, Audio etc), and the ability to back-up to a configuration file *(recommended)*.

Click 'Finish' once done to continue to the 'Drag & Drop Control' page, logged in as Administrator (see page 15).

Web-GUI - Menu Overview

The '**User Interface**' menu gives an end user the ability to switch and preview the Multicast system without allowing access to any settings that can change the overall infrastructure of the system.
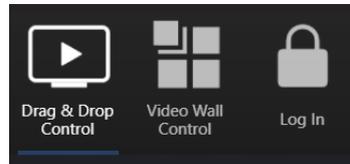
1. **Drag & Drop Control** - used for 'Drag & Drop' control of source selection for each Multicast Receiver including image preview of source devices throughout
2. **Video Wall Control** - used for 'Drag & Drop' control of source selection for each video wall array within the system, including image preview of source devices throughout
3. **Log In** - used to log into the system as a User or Administrator

The **Administrator** menu is accessed from a single password (see page 08 to log in). This menu allows to the Multicast system to be completely configured with access to all settings and features of the system.

Please note: it is not recommended to leave Administrator access or the Administrator password with an end user.
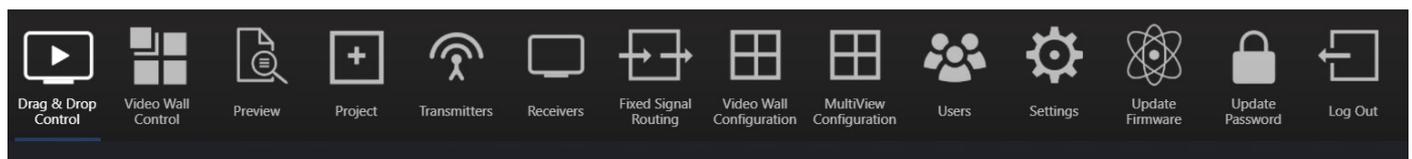
1. **Drag & Drop Control** - used for 'Drag & Drop' control of source selection for each Multicast Receiver including image preview of source devices
2. **Video Wall Control** - used for 'Drag & Drop' control of source selection for each video wall array within the system, including image preview of source devices
3. **Preview** - used to show the active video stream from any connected Multicast Transmitter or Receiver
4. **Project** - used to configure a new or existing Blustream Multicast system
5. **Transmitters** - shows a summary of all Multicast Transmitters installed, with options for EDID management, checking FW version, updating settings, adding new TX's, replacing or rebooting products
6. **Receivers** - shows a summary of all Multicast Receivers installed, with options for resolution output (HDR / scaling), function (video wall mode / matrix), updating settings, adding new RX's, replacing or rebooting products
7. **Fixed Signal Routing** - used for signal routing allowing independent routing of IR, RS-232, USB / KVM, Audio and Video signals
8. **Video Wall Configuration** - used for the set-up and configuration of Multicast receivers to create a video wall array of up to a size of 9x9, including: bezel / gap compensation, stretch / fit, and rotation
9. **MultiView Configuration** - used for the set-up and configuration of MultiView layouts
10. **Users** - used to set-up or manage users of the system
11. **Settings** - access to various system settings including: network and resetting devices
12. **Update Devices** - used for applying the latest firmware updates to the ACM500 and connected Blustream Multicast Transmiters and Receivers
13. **Update Password** - used to update the Administrator password for access to the ACM500 web-GUI
14. **Log Out** - log out the current User / Administrator

Web-GUI - Drag & Drop Control

The ACM500 Drag & Drop Control page is used to quickly and intuitively change a source input (Transmitter) for each display (Receiver). This page has been designed to allow the User to quickly switch the I/O configuration of the system.

Once the system has been fully configured the Drag & Drop Control page will show all online Multicast Transmitter and Receiver products. All Multicast products will display the active stream from the device which refreshes every few seconds.

Due to the size of the display window on certain phones, tablets or laptops, should the number of Transmitters and Receivers be larger than the size available on screen, the User is given the ability to scroll or swipe through available devices (left to right).
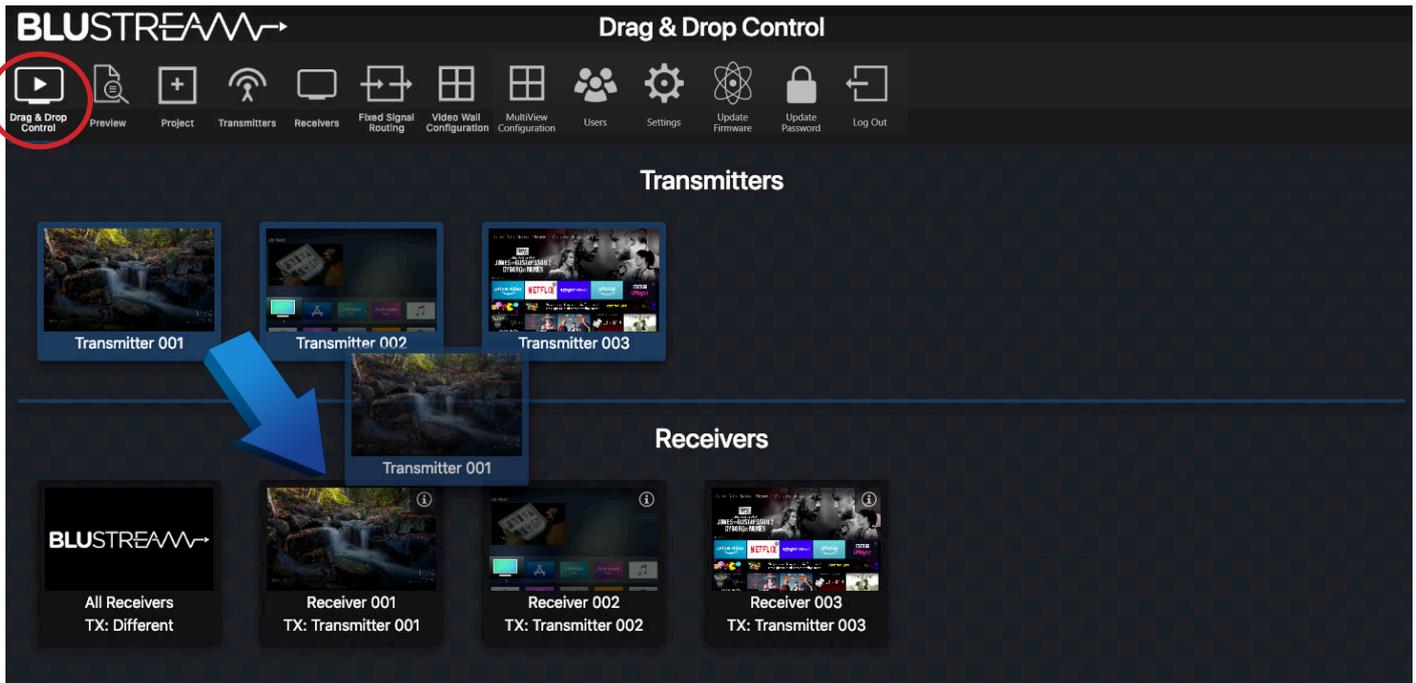
To switch sources, click on the required source and 'Drag & Drop' the Transmitter preview onto the required Receiver product. The Receiver preview window will update with the new live stream of the source selected.

The Drag & Drop switch will amend the Video/Audio stream from Transmitter to Receiver, but not Fixed Routing of control signals.

Should 'No Signal' be displayed in the Transmitter preview window, please check the HDMI source device is powered on, outputting a signal and is connected via HDMI cable to the Multicast Transmitter unit. Check also the EDID settings of the Transmitter device (Multicast will not accept 4K60 4:4:4 signals). Should 'No Signal' be displayed inside the Receiver preview window, check the unit is connected and powered from the network (switch) and has a valid connection to a working Transmitter unit.

There is an 'All Receivers' window located on the left of the Receivers window. Dragging and dropping a Transmitter onto this window will change the routing for ALLReceivers within the system to watch the source selected. Should the preview of this window show the Blustream logo, this signifies that there is a mixture of sources being watched across the range of Receivers within the system. The note underneath 'All Receivers' will display: 'TX: Different'.

Please note: the Drag & Drop Control page is also the home page for Guest Users of the Multicast system - only sources that the Guest or User have permission to view will be visible. For User set-up and permissions, see page 33.

Receivers in Video Wall Mode are not displayed on the Drag & Drop page.

Web-GUI - Video Wall Control

To assist wth simplified Video Wall switching control, there is a separate Video Wall Drag & Drop Control page. This menu option is only available once a Video Wall has been configured into the ACM500 / Multicast system.
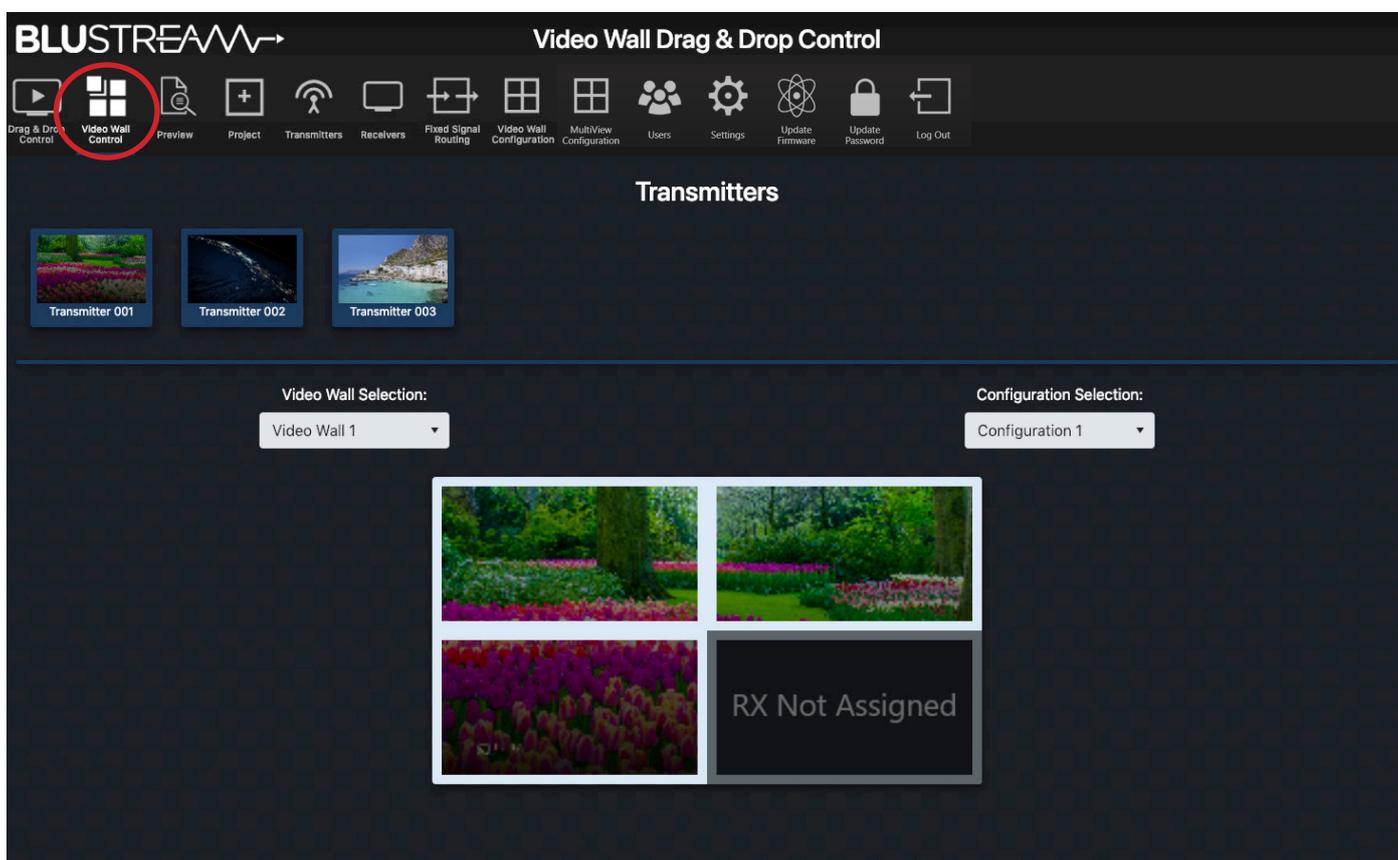
The source (Transmitter) preview windows are shown at the top of the page with the graphical representation of the Video Wall displayed below. To switch the Video Wall array from one source to another Drag & Drop the source preview window onto the Video Wall preview underneath. This will switch all connected screens within the Video Wall (within a group within a Video Wall only) to the same source / Transmitter in the Configuration that is currently selected (in a group). Or Drag & Drop a Transmitter preview onto a 'Single' screen when the Video Wall array is in an individual screen configuration.

Blustream Multicast systems can have multiple Video Walls. Selecting a different Video Wall array, or to deploy a pre-defined Configuration / preset for each Video Wall can be carried out by using the drop down boxes above the graphical representation of the Video Wall. This graphical representation will automatically update as you select a different Video Wall or Configuration.

Should a screen within a Video Wall display on the GUI show 'RX Not Assigned', this means that the Video Wall does not have a Receiver unit assigned to the array. Please revert back to Video Wall set up to assign the Receiver accordingly.

For the advanced API commands for control of Video Wall arrays within a Blustream Multicast system, please refer to the API Commands section at the rear of this manual.

Web-GUI - Preview

The Preview feature is a quick way to view the media being streamed through the Multicast system once configured. Used to preview the stream from any HDMI source device into the Multicast Transmitter, or the stream being received by any Receiver in the system concurrently. This is particularly helpful for debugging and checking source devices are powered on and outputting a HDMI signal, or to check the I/O status of the system:
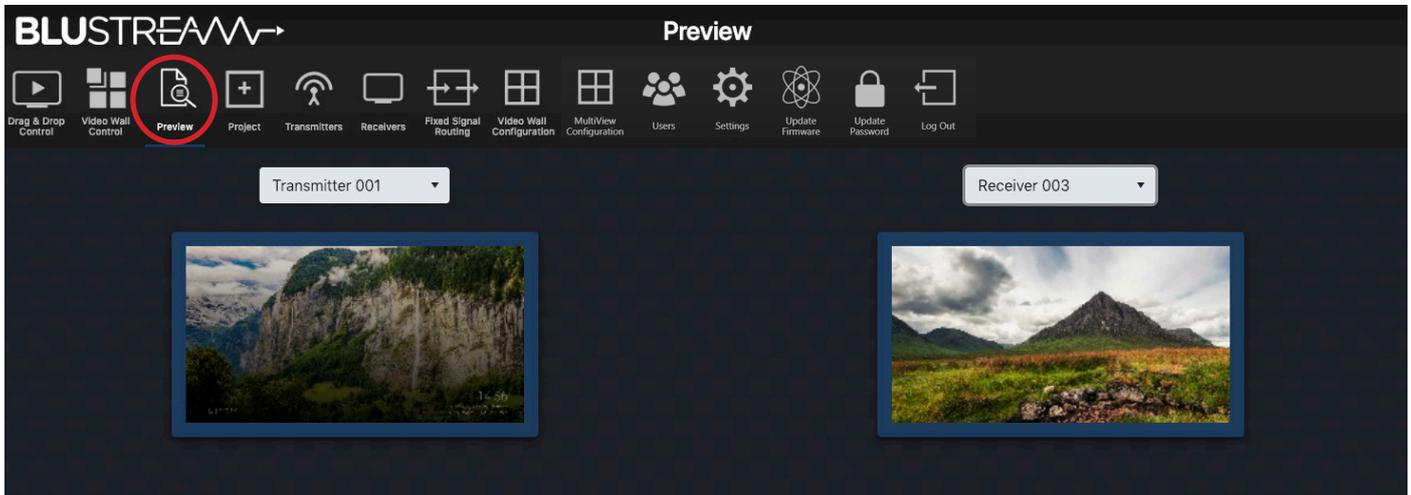

The Preview windows show a live grab of the media which automatically updates every few seconds. To select the Transmitter or Receiver to preview, use the drop down box to select the individual Transmitter or Receiver to preview.

Note that if a receiver is in video wall mode, you will receive a message "RX is assigned as part of a video wall". To preview this RX, you would need to first disable the video wall mode.

Web-GUI - Project Summary

Outlines the units that are currently set-up in the Multicast system as an overview, or for scanning the network for new devices to assign to the project:

Options on this page:

1. **Toggle OSD:** turn On / Off the OSD (On Screen Display). Toggling the OSD On shows the ID number (i.e. ID 001) of the Multicast Receiver on each display as an overlay to the media being distributed. Toggling OSD Off removes the OSD.
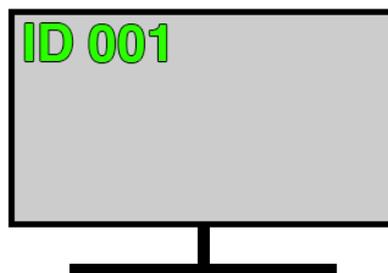

2. **Export Project:** create a save file (.json) for the configuration of the system.

3. **Import Project:** import an already configured project into the current system. This is particularly helpful when setting up a secondary system or expansion to a current system off-site where the two systems can be merged into one.

4. **Clear Project:** clears the current project.

5. **Continuously Scan & Auto Assign:** continuously scan the network and auto assign new Multicast devices to the next available ID and IP address as connected. If only connecting ONE new unit, use the 'Scan Once' option - the ACM500 will continue to scan the network for new Multicast devices until found, or select this button again to stop the scan.

6. **Scan Once:** scan the network once for any new Multicast devices connected, and then be presented with a pop up to either manually assign the new device, or auto assign a new unit to the next available ID and IP address as connected.

Web-GUI - Transmitters

The Transmitter summary page is an overview of all Transmitter devices that have been configured within the system, with the ability to update the system as required.

Features of the Transmitter summary page include:

1. **ID / Input** - the ID / Input number is used for control of the Multicast system when using third party drivers.

2. **Name** - the name of the Transmitter (typically the device attached to the Transmitter).

3. **IP Address** - the IP address assigned to the Transmitter during configuration.

4. **MAC Address** - shows the unique MAC address of the Transmitter.

5. **Firmware** - displays the firmware version currently loaded onto the Transmitter. For more information on firmware updating, please see 'Update Devices' on page 37.

6. **Status** - shows the online / offline status of each Transmitter. Should a product show as 'Offline', check the units connectivity to the network switch.

7. **EDID** - fix the EDID value for each Transmitter (source). This is used to request specific video and audio resolutions for the source device to output. Basic help can be obtained on EDID selection by clicking the button at the top of the page marked 'EDID Help'. EDID selections as follows:

- 1080P 2.0CH (Default)	- 1080P 3D 7.1CH	- 4K2K60 4:4:4 5.1CH
- 1080P 5.1CH	- 4K2K30 4:4:4 2.0CH	- 4K2K60 4:4:4 7.1CH
- 1080P 7.1CH	- 4K2K30 4:4:4 5.1CH	- 4K2K60 4:4:4 2.0CH HDR
- 1080I 2.0CH	- 4K2K30 4:4:4 7.1CH	- 4K2K60 4:4:4 5.1CH HDR
- 1080I 5.1CH	- 4K2K60 4:2:0 2.0CH	- 4K2K60 4:4:4 7.1CH HDR
- 1080I 7.1CH	- 4K2K60 4:2:0 5.1CH	- User EDID 1
- 1080P 3D 2.0CH	- 4K2K60 4:2:0 7.1CH	- User EDID 2
- 1080P 3D 5.1CH	- 4K2K60 4:4:4 2.0CH	

8. **Analogue Audio** - select the function of the analogue audio connector between an analogue audio input which is embedded over the HDMI audio or an analogue audio output which extracts the source audio (supports 2ch PCM audio only)

9. **Audio Selection** - selects either original HDMI audio, or replaces the embedded audio with a local analogue audio input on the Transmitter. Default setting will be 'Auto'.

10. **CEC** - opens a pop-up window that allows you to send CEC commands out to the source device to control it.

11. **Actions** - opens a pop-up window with advanced configuration settings. See following page for further information.

Web-GUI - Transmitters - Actions

The 'Actions' button allows for advanced features of the units to be accessed and configured.

Features of the Actions menu include:

1. **Name** - Transmitter names can be amended by entering a name into the free-form text box. **Please note:** this is limited to 16 characters in length, and some special characters may not be supported.

2. **URL** - This displays a link to the web GUI for the IP50UHD-TZ device

3. **Temperature** - Displays the temperature of the unit.

4. **Update ID** - the ID of a unit is set as default to the same number as the last 3 digits of the units IP address i.e. Transmitter number 3 is assigned an IP address of 169.254.3.3 and will have an ID of 3. Amending the ID of the unit is not normally recommended.

5. **CEC Pass-through (On / Off)** - allows for CEC (Consumer Electronic Command) to be sent through the Multicast system to and from the source device connected to the Transmitter. **Please note:** CEC must be enabled on the Receiver unit also for the CEC commands to be sent between. Default setting for this fesature is Off.

6. **Front Panel Buttons (On / Off)** - use this to enable / disable the front panel buttons on the IP500HD-TZ.

7. **Rear Panel IR (On / Off)** - enable or disable the IR input/output on the rear of the IP500UHD-TZ.

8. **Rear Panel IR Voltage (5V / 12V)** - select between 5V or 12V for the IR input/output on the rear of the IP500UHD-TZ.

9. **Front Panel Display (On / Off / On 90 Seconds)** - Set the front panel to permanently on, off or timeout after 90 seconds. **Please note:** it is not recommended to set the front panel display to always on as this may reduce the life of the OLED display.

10. **Front Panel ENC LED Flash (On / Off / On 90 Seconds)** - will flash the ENC LED on the front panel of the device to help identify the product. following auto configuration. Options are: flash the power light continuously, or flash the LED for 90 seconds before the LED goes back to being permanently lit.

11. **Copy EDID** - see page 21 for further information on Copy EDID.

12. **Serial Settings** - turn on serial 'Guest Mode' and set the individual serial port settings for the device (i.e. Baud Rate, Parity etc).

13. **Preview** - displays a pop-up window with live a screen grab of the source device connected to the Transmitter.

14. **Reboot** - reboots the Transmitter.

15. **Replace** - used to replace an offline Transmitter. **Please note:** the Transmitter to be replaced must be offline for this feature to be utilised, and the new Transmitter must be a factory default unit with default IP address: 169.254.100.254.

16. **Remove from Project** - removes the Transmitter device from the current project.

17. **Factory Reset** - restores the Transmitter to its original default settings and sets the IP address to: 169.254.100.254.

18. **Switch to Receiver** - switches the IP500UHD-TZ from Transmitter mode to Receiver mode.

Web-GUI - Transmitters - Actions - Copy EDID

EDID (Extended Display Identification Data) is a data structure that is used between a display and a source. This data is used by the source to find out what audio and video resolutions are supported by the display then from this information the source will discover what the best audio and video resolutions need to be output.

While the objective of EDID is to make connecting a digital display to a source a simple plug-and-play procedure, issues can arise when multiple displays, or video matrix switching is introduced because of the increased number of variables.

By pre-determining the video resolution and audio format of the source and display device you can reduce the time need for EDID hand shaking thus making switching quicker and more reliable.

The Copy EDID function allows the EDID of a display to be grabbed and stored within the ACM500. The EDID configuraiton of the screen can be recalled within the EDID selection of the Transmitter. The displays EDID can then be applied to any source device not displaying correctly on the screen in question.

It is recommended to ensure that the media from the Transmitter with the custom EDID displays correctly on other displays within the system.

Please note: it is important that only one screen is viewing the Transmitter at the time the EDID Copy takes place.

Web-GUI - Receivers

The Receiver summary window gives an overview of all the Receiver devices that have been configured within the system, with the ability to update the system as required.

Features of the Receiver summary page include:

1. **ID / Output** - the ID / output number is used for control of the Multicast system when using third party drivers.

2. **Name** - the name of the Receivers (typically the device attached to the Receiver) are automatically assigned default names i.e. Receiver 001 etc. Receiver names can be amended within the Device Setup page (within the Wizard), or by clicking on the 'Actions' button for an individual unit - see page 23.

3. **IP Address** - the IP address assigned to the Receiver during configuration.

4. **MAC Address** - shows the unique MAC address of the Receiver.

5. **Firmware** - displays the firmware version currently loaded onto the Receiver. For more information on updating firmware, please see 'Update Devices

6. **Status** - shows the online / offline status of each Receiver. Should a product show as being 'Offline', check the units connectivity to the network switch.

7. **Source** - shows the current source selected at each Receiver. To switch source selection, choose a new Transmitter from the drop-down selection.

8. **Display Mode (Genlock / Fast Switch)** - specify between Genlock of Fast Switch mode. Genlock locks the signal to a fixed reference to synchronize picture sources together. Fast Switch allows for seamless switching by use of a video scaler.

9. **Resolution** - adjust the output resolution using the built-in video scaler inside the Multicast Receiver. The scaler is capable of both upscaling and downscaling the incoming video signal. Output resolutions include:
    - Pass Through - the Receiver will output the same resolution that the source is outputting
    - 1280x720   - 1280x768
    - 1920x1080   - 1360x768
   - 3840x2160   - 1680x1050
    - 4096x2160   - 1920x1200

10. **Function** - identifies the Receiver as a standalone product (Matrix) or as part of a Video Wall.

11. **CEC** - opens a pop-up window that allows you to send CEC commands out to the display device to control it.

12. **Actions** - see next for breakdown of additional actions options

13. **Scaling Help** - you can obtain some basic help with scaling selection by clicking the button at the top of the page marked 'Scaling Help'.

14. **Refresh** - click here to refresh all current information on the devices within the system.

Web-GUI - Receivers - Actions

The 'Actions' button allows for advanced features of the Receiver to be accessed and configured.

1. **Name** - can be amended by entering a name into the free-form text box. **Please note:** this is limited to 16 characters in length, and some special characters may not be supported.

2. **Temperature** - Displays the temperature of the unit.

3. **Update ID** - the ID is defaulted to the last 3 digits of the device IP address i.e. Receiver 3 is assigned an IP address of 169.254.6.3. Update ID allows you to amend the ID of the unit (*not recommended*).

4. **CEC Pass-through (On / Off)** - allows for CEC (Consumer Electronic Command) to be sent through the Multicast system to and from the display device connected to the Receiver. Please note: CEC must also be enabled on the Transmitter.

5. **Video Output (On / Off)** - enable or disable the video output of the unit.

6. **Video Mute (On / Off)** - enable or disable the video mute of the device.

7. **Video Auto On (On / Off)** - when on, enables the video output when a signal is received.

8. **Front Panel Buttons (On / Off)** - the Channel buttons on the front of each Receiver can be disabled to stop unwanted switching or manual configuration once the Receiver have been configured.

9. **Rear Panel IR (On / Off)** - enables or disables the Receiver from accepting IR commands to change source.

10. **Rear Panel IR Voltage (5V / 12V)** - select between 5V or 12V for the IR input/output on the rear of the IP500UHD-TZ.

11. **Front Panel Display (On / Off / On 90 Seconds)** - Set the front panel to permanently on, off or timeout after 90 seconds. **Please note:** it is not recommended to set the front panel display to always on as this may reduce the life of the OLED display.

12. **Front Panel ENC LED Flash (On / Off / On 90 Seconds)** - will flash the ENC LED on the front panel of the device to help identify the product. following auto configuration. Options are: flash the power light continuously, or flash the LED for 90 seconds before the LED goes back to being permanently lit.

13. **On Screen Product ID (On / Off / 90 Seconds)** - turn On / Off the On Screen Product ID. Toggling the On Screen Product ID On shows the ID (i.e. ID 001) of the Receiver overlayed on the display connected to the device. If 90 Seconds is selected, the OSD displays for 90 seconds. Toggling On Screen Product ID Off removes the OSD.

14. **Aspect Ratio** - maintain aspect ratio (function reserved for future use).

15. **Serial Settings** - enable serial 'Guest Mode' and set the serial port settings for the device (i.e. Baud Rate, Parity etc).

16. **Preview** - displays a pop-up window with live screen grab of the source device connected to the Transmitter.

17. **Reboot** - reboots the Receiver.

18. **Replace** - used to replace an offline Receiver. Please note: the unit to be replaced must be offline for this feature to be utilised, and the new Receiver must be a factory default unit with IP address: 169.254.100.254.

19. **Remove from Project** - removes the Receiver from the project. This does not apply factory reset the Receiver.

20. **Factory Reset** - restores the Receiver to it's original default settings and sets the default IP address.

Web-GUI - Fixed Signal Routing

The ACM500 is capable of advanced independent routing of the following signals via the Multicast system:

• Video

• Audio

• Infrared (IR)

• RS-232

• USB / KVM

• CEC (Consumer Electronic Command)

This allows each signal to be fixed from one Multicast product to another and not be affected by standard video switching. This can be useful for IR, CEC or RS-232 control of products in the field using the Multicast system to extend control commands from a third party control solution, or a manufacturers IR remote control.

Please note: with the exception of IR and RS-232, routing can only be fixed from a Receiver to a Transmitter product. Although routing can only be set up one way, the communication is bi-directional between the two products. For routing IR or RS-232 between 2x Transmitter units, please see page 19 / 20.
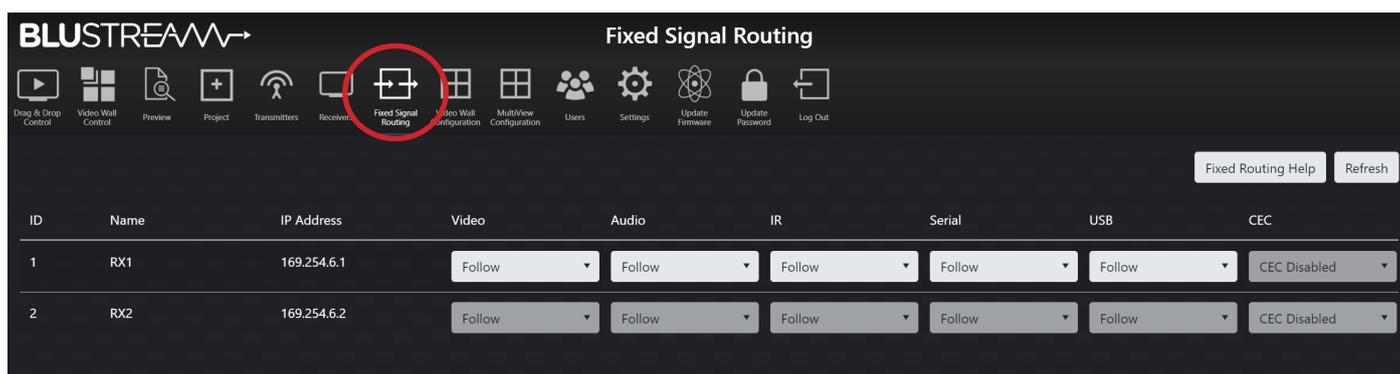
By default, the routing of: Video, Audio, IR, Serial, USB and CEC will automatically follow the Transmitter selection of the Receiver unit.

To select a fixed route, use the drop down box for each of the individual signals / Receivers to fix a route.

Once an ACM500 has been added into a Multicast system, the IR switching control abilities (not IR pass-through) and the front panel CH buttons of the Multicast Receivers are enabled by default. This is disabled from the Actions function contained within the Receiver summary page - see page 23.

Routing can be cleared by selecting 'Follow' at any point from the web-GUI. More information on Fixed Routing can be found by clicking 'Fixed Routing Help'.

For advanced routing commands for Video, Audio, IR, RS-232, USB and CEC when using with a 3rd party control system, please refer to the API section at the rear of this manual.
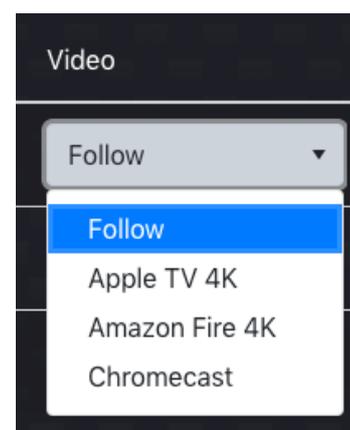
Fixed Routed Audio

The ACM500 allows for the audio component of a HDMI signal to be routed independently throughout the Blustream Multicast system. Under normal operation the embedded audio within a HDMI signal will be distributed with the associated video signal from Transmitter to Receiver/s.

The fixed audio routing capabilities of the ACM500 allow for the audio track from one source to be embedded onto another Transmitters video stream.

Fixed Routed IR

The fixed IR routing feature allows a fixed bi-directional IR link between 2x Multicast products. The IR signal is only routed between configured RX to TX, or TX to TX products. This can be useful for sending IR from a centrally located third party control solution (ELAN, Control4, RTi, Savant etc) and using the Blustream Multicast system as a method of extending IR out to a display or another product in the system. The IR link is bi-directional so can also be sent back the opposite way at the same time.

To display device

Third party control system
i.e. - Control4, ELAN, RTI etc.
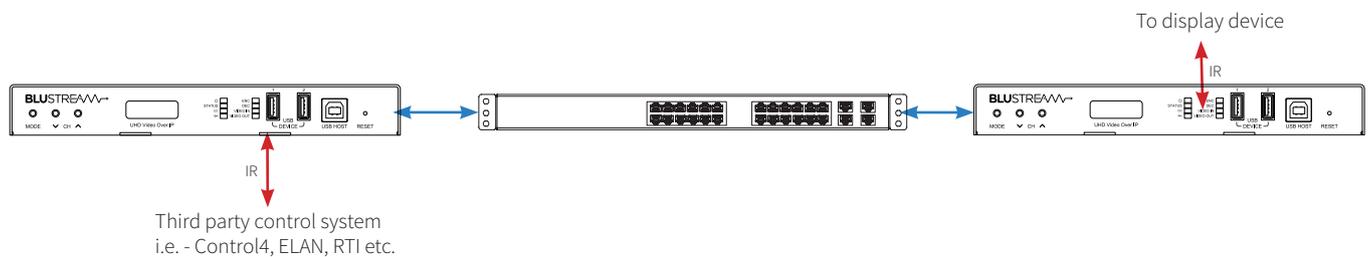
Connections:

The third party control processor IR, or Blustream IR receiver, is connected to the IR RX socket on the Multicast Transmitter or Receiver.

Please note: You must use Blustream 5V IRR Receiver or Blustream IRCAB (3.5mm stereo to mono 12V to 5V IR converter cable). Blustream Infrared products are all 5V and **NOT** compatible with alternative manufacturers Infrared solutions.
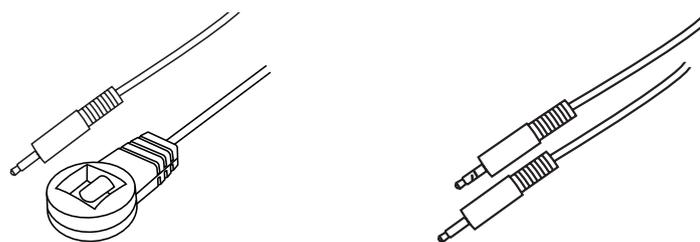
The Blustream 5V IRE1 Emitter is connected to the IR OUT socket on the Multicast Transmitter or Receiver.

The Blustream IRE1 & IRE2 Emitters are designed for discrete IR control of hardware.

(IRE2 - Dual Eye Emitter sold separately)
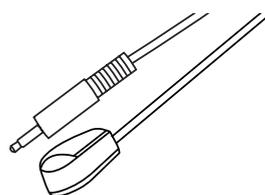
Fixed Routed USB / KVM

The fixed USB routing feature allows a fixed USB link between a Multicast Receiver/s and a Transmitter. This can be useful for sending KVM signals between a users position to a centrally located PC, server, CCTV DVR / NVR etc.
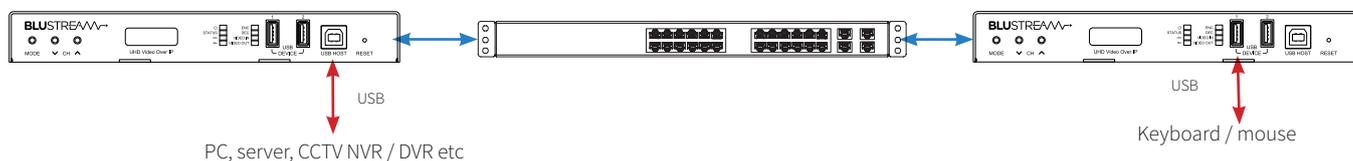
USB Specifications:

USB Specification	USB1.1
Extension	Over IP, Hybrid redirection technology
Distance	100m
Distance Ext.	via Ethernet switch hub
Max Downstream Devices	4
Topology	1 to 1 1 to many simultaneously Keyboard / Mouse (K/MoIP)

Fixed Routed CEC

CEC or Consumer Electronic Command is a HDMI embedded control protocol that allows for commands to be sent from one HDMI device to another for simple actions such as: Power, Volume etc.

The Blustream Multicast system allows for the CEC channel within the HDMI link between two products (source and sink) to communicate with eachother using the CEC protocol.

CEC must be enabled (this is sometimes referred to as 'HDMI Control') on both the source device and the display device in order for the Multicast system to communicate the CEC commands over the Multicast link.

Please note: the Blustream Multicast system will only transport the CEC protocol transparently. It is advisable to ensure that the source and sink devices will communicate effectively before committing to this control type with Multicast. Should an issue be experienced with CEC communication between the source and sink directly, this will be mirrored when sending through the Multicast system.

Web-GUI - Video Wall Configuration

Blustream Multicast Receivers can be configured to be part of a Video Wall array within the ACM500. Any Multicast system can contain up to 9x Video Wall arrays of differing shapes and sizes. Ranging from 1x2 up to 9x9.
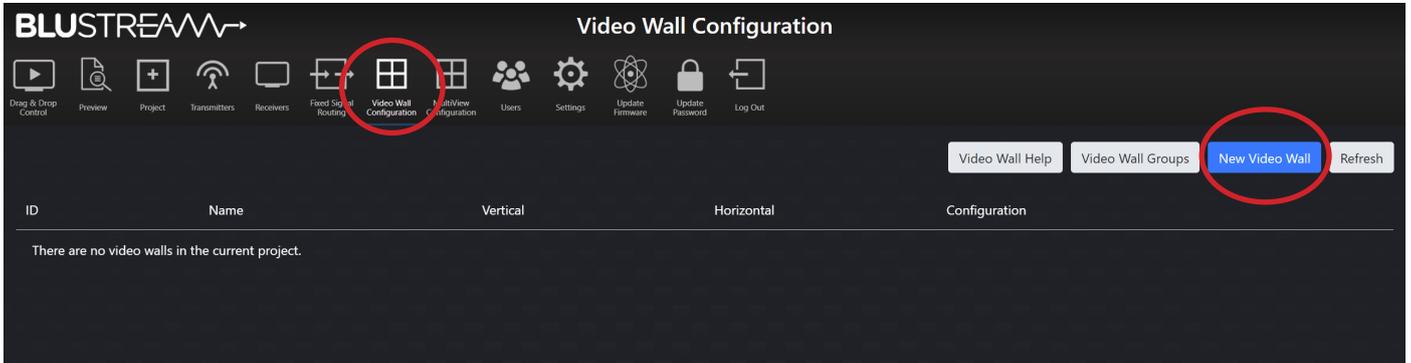
To configure a new Video Wall array, navigate to the Video Wall Configuration menu and click the button labelled 'New Video Wall' as marked at the top of the screen. Help with creating a Video Wall array can be found by clicking the button marked 'Video Wall Help'.

Please note: the Multicast Receivers that will be used for the Video Wall should have been configured as individual Receivers before proceeding past this point. It is good practice to have already named the Multicast Receivers for ease of configuration i.e. "Video Wall 1 - Top Left".

Enter the relevant information into the pop-up window to name and select the number of panels both horizontally and vertically within the Video Wall array. Once the correct information has been inserted onto the screen, select 'Create' to create the Video Wall array template within the ACM500.

# Web-GUI - Video Wall Configuration - continued...
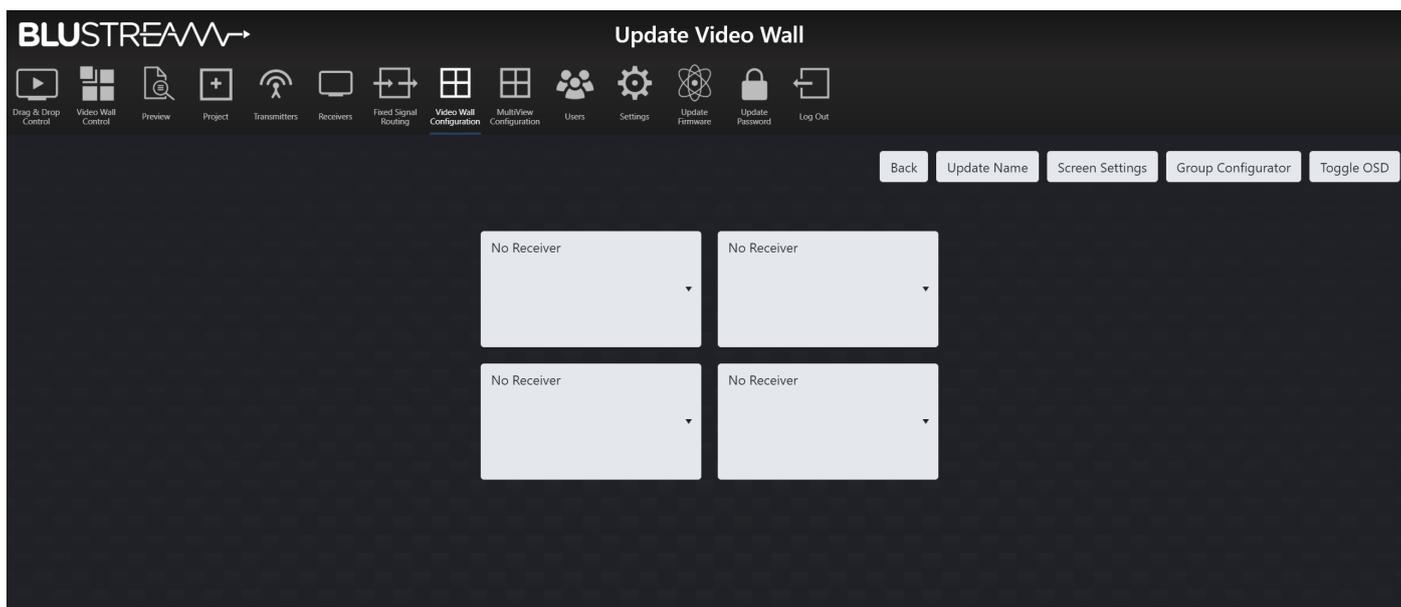
The menu page for the new Video Wall array has the following options:

1. **Back** - returns to the previous page for creating a new Video Wall.

2. **Update Name** - amend the name given to the Video Wall array.

3. **Screen Settings** - adjustment of bezel / gap compensation of the screens being used. See next page for more details on Bezel settings.

4. **Group Configurator** - there are options to be able to create multiple configurations (or 'presets') for each Video Wall array within the Multicast system. The grouping / preset allows for the Video Wall to be deployed in multiple ways i.e. grouping different numbers of screens together to create different sized walls within a single array.

5. **Toggle OSD** - turn On / Off the OSD (On Screen Display). Toggling the OSD On will show the ID number (i.e. ID 001) of the Multicast Receiver on each display connected to the Receiver as an overlay to the media being distributed. Toggling OSD Off removes the OSD. This allows easier identification of displays within a Video Wall during configuration and set-up.

**Display / Receiver Assign**:

The ACM500 will create a visual representation of the Video Wall onto the page. Use the drop down arrows for each screen to select the relevant Multicast Receiver product connected to each screen on the Video Wall array.

Web-GUI - Video Wall Configuration - Bezel Settings

This page allows for the compensation for the size of each screen bezel within the Video Wall, or alternatively for any gaps inbetween screens. By default, the Multicast system will insert the bezels of the Video Wall screens "inbetween" the overall image (splitting the image). This will mean that the bezels of the screens do not sit "over" any part of the image. By adjusting the Outer Width (OW) vs View Width (VW), and the Outer Height (OH) vs View Height (VH), the screen bezels can be adjusted to sit "on top" of the image that is being displayed.

All units are by default 1,000 - this is an arbitary number. It is recommended to use the dimensions of the screens being used in mm. To compensate for bezel size of the screens being used, reduce the View Width and View Height accordingly to compensate for the size of the bezels. Once the outcome of the corrections required has been obtained, the 'Copy Bezels to All' button can be used to copy the settings to each display. Click 'Update' to confirm settings and return to the previous Update Video Wall screen.

The 'Bezel Help' button opens a pop-up window with guidance to the correction and adjustment of these settings.
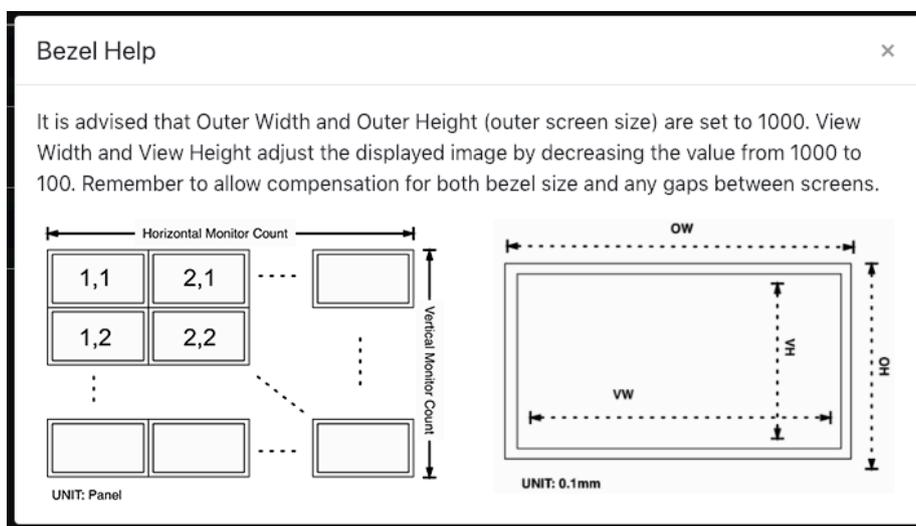
Web-GUI - Video Wall Configuration - Group Configurator

Once the Video Wall array has been created, it can be configured for different display options. The Video Wall Configurator allows for presets to be created for deploying the Video Wall to adjust for different groups of images across the array. Click the 'Group Configurator' button from the Update Video Wall screen.
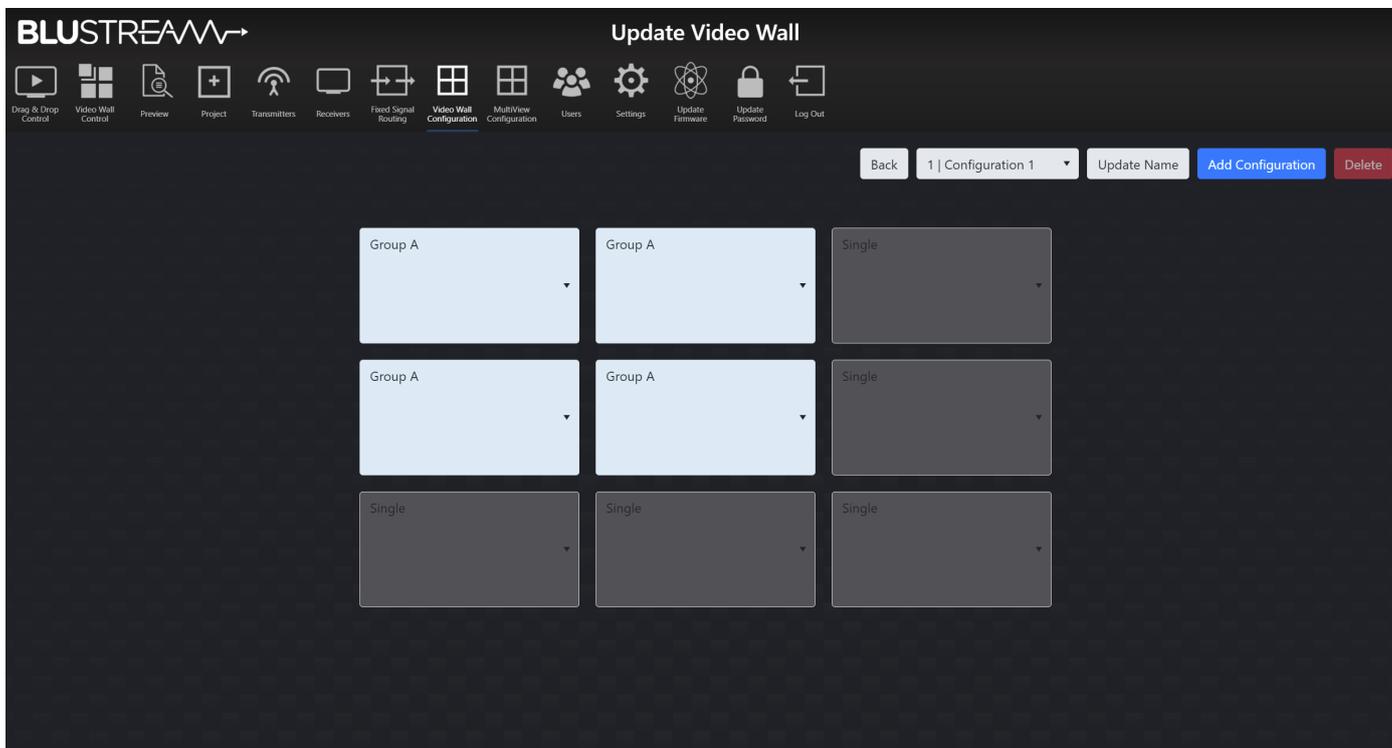

Options within this menu as follows:

1. **Back** - navigates back to the Update Video Wall page without making any changes to the set-up.
2. **Configuration Dropdown** - move between different configurations / presets previously set-up for the Video Wall array. By default, 'Configuration 1' will be inserted for a Video Wall being created and configured for the first time.
3. **Update Name** - set the name of the configuration / preset i.e. 'Single Screens' or 'Video Wall'. By default, configuration / preset names will be set as 'Configuration 1, 2, 3...' until changed.
4. **Add Configuration** - adds a new configuration / preset for the selected Video Wall.
5. **Delete** - removes the currently selected configuration.

Group Assign:

Grouping allows for the Video Wall to be deployed in multiple ways i.e. creating different sized Video Walls within a larger Video Wall array. Use the dropdown selection for each screen to create a Group within the Video Wall:
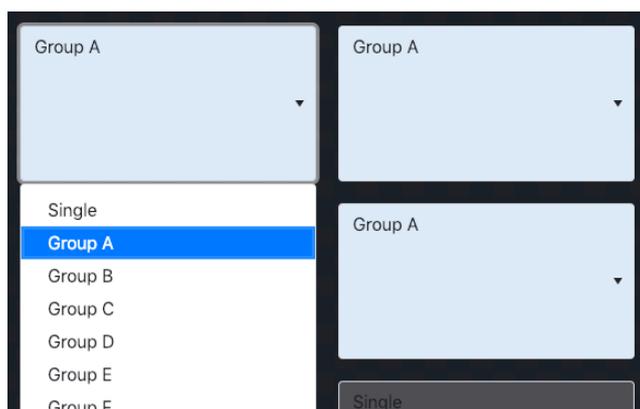
See next page for further explanation on how a larger Video Wall array can have multiple Groups configured within.

Web-GUI - Video Wall Configuration - Group Configurator

For example: a 3x3 Video Wall array can have multiple configurations / presets:

- For displaying 9x different source media streams - so that all screens work independently with each individual screen showing a single source - not grouped (leave all dropdowns as 'Single').

- As a 3x3 Video Wall - displaying one source media stream across all 9 screens (all screens need to be selected as 'Group A').

- For displaying a 2x2 Video Wall image within the overall 3x3 Video Wall array. This can have 4x different options:

    - With the 2x2 in the top left of the 3x3, with 5x individual screens to the right and bottom (select the 2x2 in the top left as Group A with other screens set as 'Single') - see example below...

    - With the 2x2 in the top right of the 3x3, with 5x individual screens to the left and bottom (select the 2x2 in the top right as Group A with other screens set as 'Single').

    - With the 2x2 in the bottom left of the 3x3, with 5x individual screens to the right and top (select the 2x2 in the bottom left as Group A with other screens set as 'Single').

    - With the 2x2 in the bottom right of the 3x3, with 5x individual screens to the left and top (select the 2x2 in the bottom right as Group A with other screens set as 'Single').

With the above example, there would be the need to create 6 different configurations for the Video Wall array, allocating the grouped screens to a Group using the selection dropdown. The Configurations / Groups can be renamed as required using the 'Update Name' option in the Group Configuration screen.

Additional configurations can be created with screens assigned as groups. This allows multiple video sources to be viewed at the same time and will appear as a Video Wall within a Video Wall. The below example has two different sized Video Walls inside a 3x3 array. This configuration contains 2 groups:

Web-GUI - Video Wall Configuration

Once the Video Wall has been created, named accordingly, and groups / presets have been assigned, the configured Video Wall can be viewed from the main Video Wall Configuration page:


Configurations / presets that have been designed within the system will now appear within the Video Wall Groups page. The Video Wall Configuration page allows for a group to be switched.

The 'Refresh' button refeshes the current page and the configuration of the Video Wall array currently being displayed. This is particularly helpful when testing Video Wall configuration commands from a third party control system.

Please see the advanced API commands for use with third party control systems for Video Wall control, Configuration switching and Group selection towards the rear of thids guide.

Web-GUI - MultiView Configuration

Blustream Multicast Receivers can be configured to display a MultiView image within the ACM500. Any Multicast system can contain up to 100 MultiView presets with differing layouts and configurations.
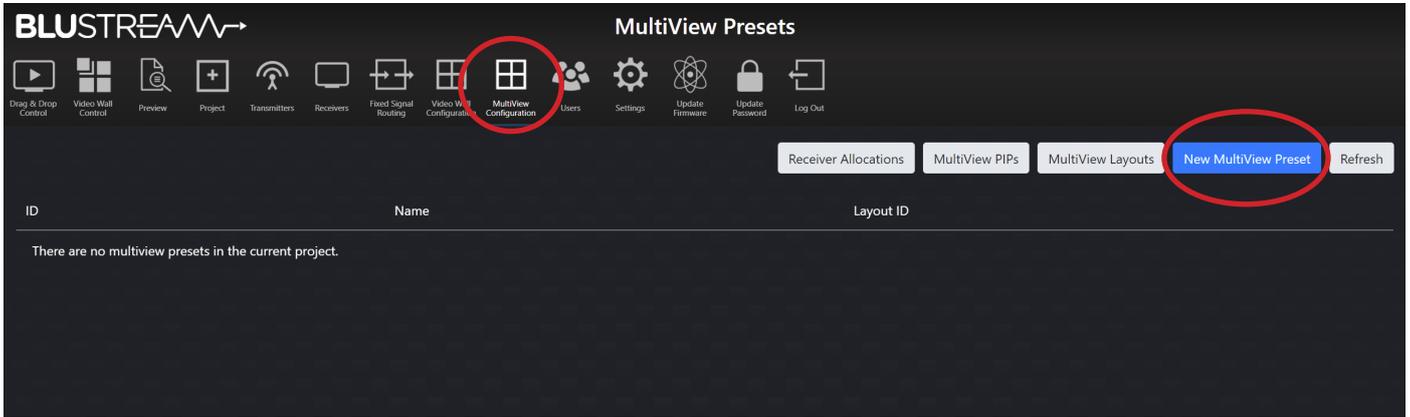
To configure a new MultiView preset, navigate to the MultiView Configuration menu and click the button labelled 'New MultiView Preset' as marked at the top of the screen.
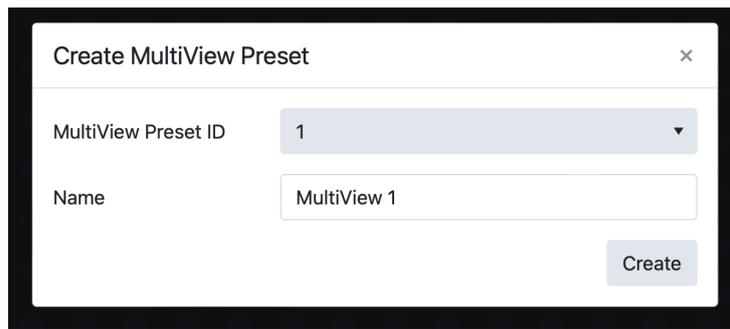

Multiple MultiView presets can be created, name the MultiView Preset in the field on the pop-up and click 'Create'.

The possible MultiView layout designs are presented. Click on the layout design required for the screen/screens:
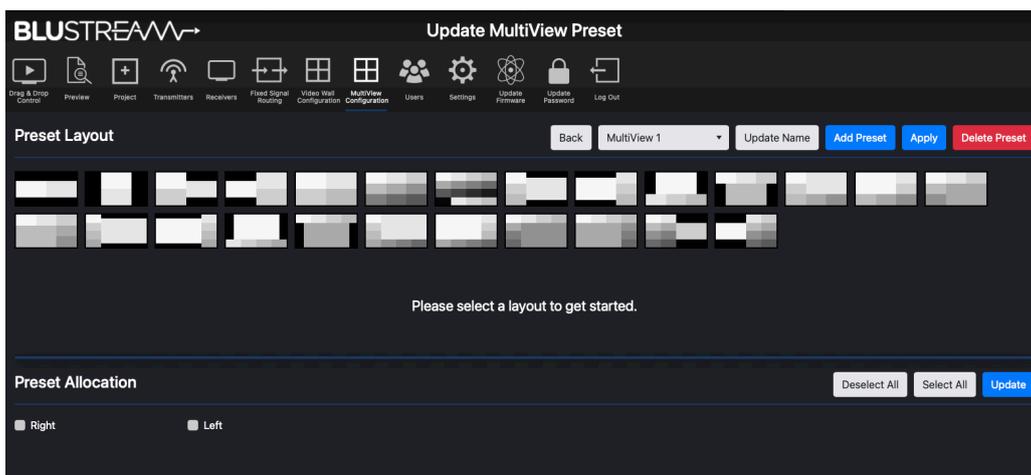
Web-GUI - MultiView Configuration

Once the layout has been selected, a graphical representation of how the MultiView tiles will be presented on the display. In the below example, Layout 5 is selected with 4x sources being able to be displayed on a single screen in a quad screen format:
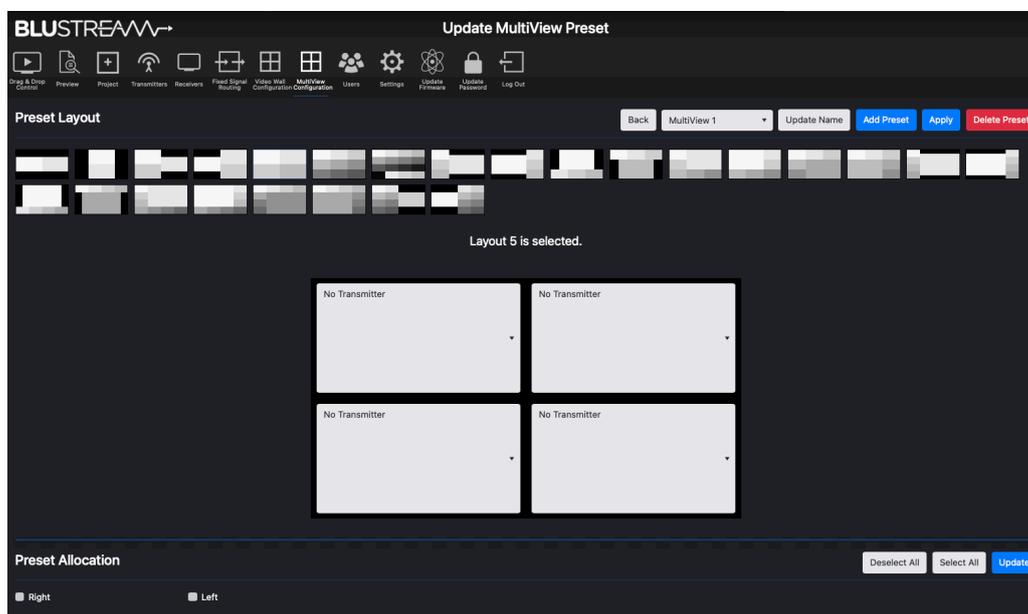
Use the small downward pointing arrows to assign Transmitters to the quadrants of the MultiView layout.

Please note: unlike with Video Wall configuration, it is possible to duplicate the windows having the same source device displayed multiple times within a MultiView configuration.
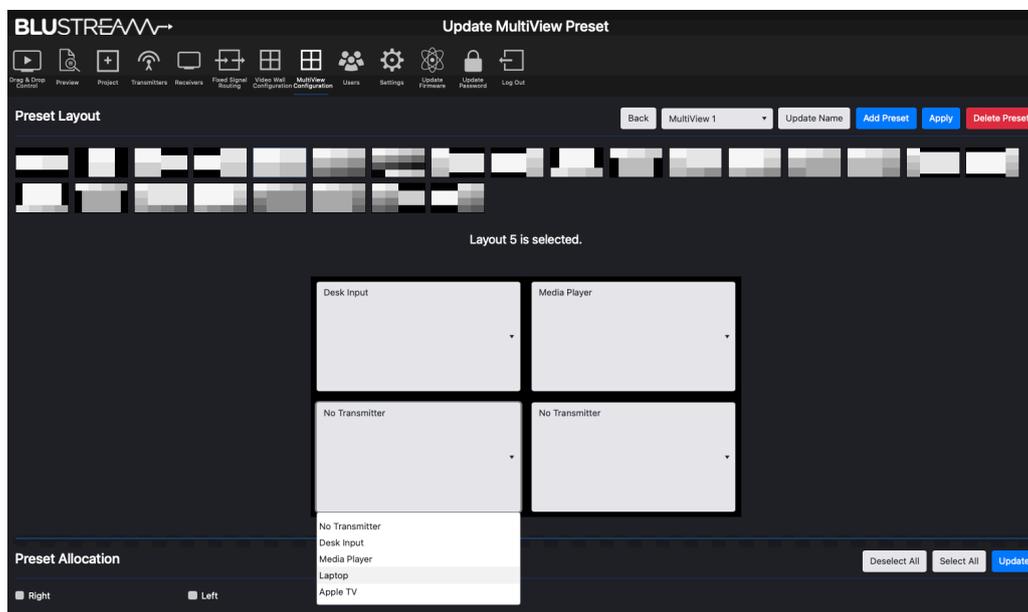
Once the preset has had the source devices assigned to the quadrants of the MultiView layout, select which Receiver / display the MultiView preset can be recalled on using the tick buttons at the bottom of the window. Click the Update button in the bottom right hand corner of the window once the Receivers have been allocated.

Please note: the MultiView can only be recalled onto Receivers that have been allocated using these tick buttons. This can be amended by going back into the MultiView Configuration at a later date.

Click 'Apply' at the top of the screen to save the settings.

From this page, the name of the preset can be amended, the preset can be deleted, or a new preset can be added.

Web-GUI - MultiView Configuration

When using MultiView configurations in the IP500 series product, there is a bandwidth limitation within the SDVoE technology, which works at a maximum of 10Gbps.

Streaming all imagery in its native format (where, for instance, sources are all outputting at 4K), would exceed the maximum bandwidth of the systems overall capabilities. The IP500 series product will automatically downscale the main and/or sub-streams to a lower resolution to avoid the system from being overloaded.

For main stream windows, the image may have to be automatically be down-scaled so that the combined stream data rate doesnt exceed 10Gbps, using the following rules:

- 4K60Hz (4:4:4, 4:2:2, 4:2:0) down to 720p (60Hz or 30Hz) or 540p (60Hz or 30Hz)

- 4K30Hz (4:4:4, 4:2:2) down to 1080p (30Hz), 720p (60Hz or 30Hz) or 540p (60Hz or 30Hz)

- 1080p 60Hz down to 1080p (30Hz), 720p (60Hz or 30Hz) or 540p (60Hz or 30Hz)

The below table is an overview, when using the different multiview layouts, the maximum resolutions that the system will work to for sub-stream windows:.

MultiView Layout	Large Window Max sub-stream resolution	Small Window Max sub-stream resolution
1	720p 60Hz	n/a
2	720p 60Hz	n/a
3	720p 60Hz	n/a
4	720p 60Hz	n/a
5	720p 60Hz	n/a
6	720p 30Hz	720p 60Hz
7	540p 30Hz	540p 30Hz
8	1080p 60Hz	720p 60Hz
9	1080p 60Hz	720p 60Hz
10	1080p 60Hz	720p 60Hz
11	1080p 60Hz	720p 60Hz
12	1080p 60Hz	720p 60Hz
13	1080p 60Hz	720p 60Hz
14	1080p 60Hz	720p 60Hz
15	1080p 60Hz	720p 60Hz
16	1080p 60Hz	540p 30Hz
17	1080p 60Hz	540p 30Hz
18	1080p 60Hz	540p 30Hz
19	1080p 60Hz	540p 30Hz
20	1080p 60Hz	540p 30Hz
21	1080p 60Hz	540p 30Hz
22	1080p 60Hz	540p 30Hz
23	1080p 60Hz	540p 30Hz
24	1080p 60Hz	540p 30Hz
25	1080p 60Hz	540p 30Hz
26	1080p 60Hz	540p 30Hz

Web-GUI - MultiView Configuration

Once the differing layouts and presets for each RX or sets of RX's have been created, the Drag and Drop Control page features the ability to recall a MultiView layout, depicted by the letter MV in the top left of the RX window:
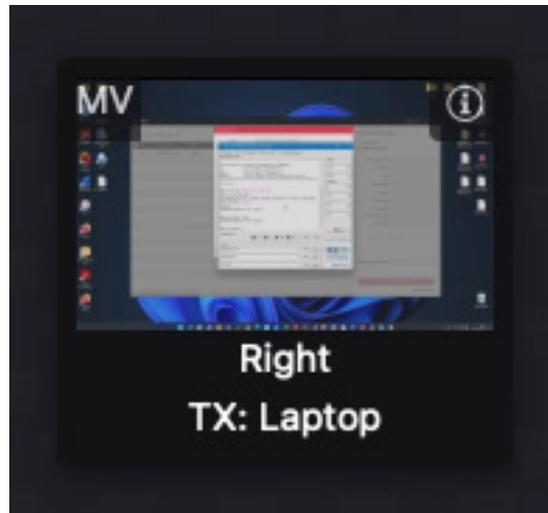
Clicking on the MV symbol for the RX that needs to have a Mulit-View window applied, shows a visual representation of the screen in its current state or layout. The available MultiView presets are able to be selected from the options at the bottom of the window. To select one of the available MultiView options, drag and drop the Preset onto the representation of the screen. The display will immediately change its layout to the selected Preset.
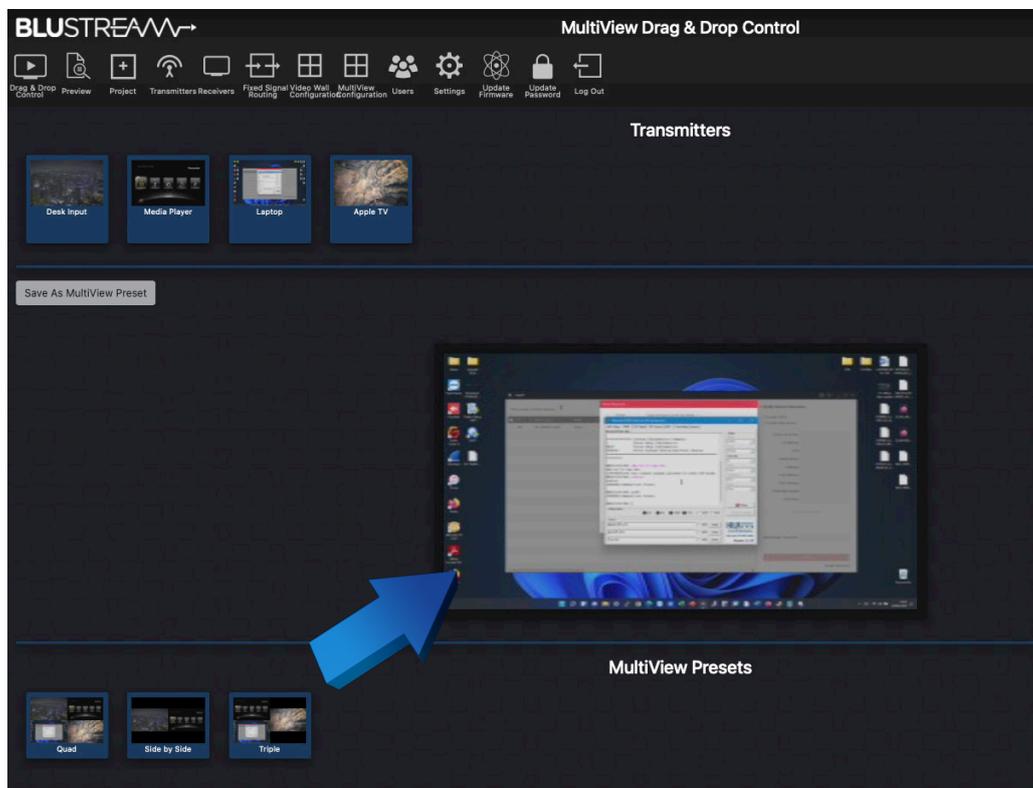
Web-GUI - MultiView Configuration

Once the Preset has been dropped onto the main window. It is possible to drag and drop source devices onto any avialable quadrant of the screen in its current MultiView state.

The SC icon in the top right of each quarant will allow for the window / quadrant to be cleared this physically removes the TX assignment and will show a blank area on the cleared quadrant. The insert new source media here, simply drag and drop a new transmitter onto the blank window.

To update the Preset Configuration at any point, click the 'Save As MultiView Preset' button.
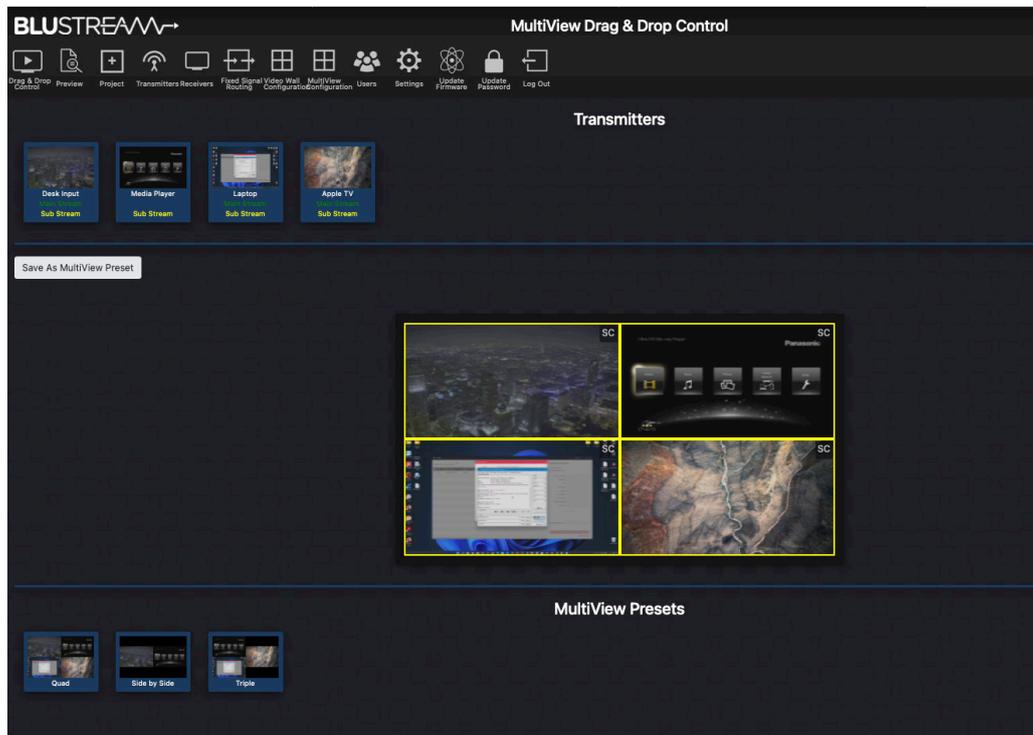
To remove the MultiView Preset from a display, navigate back to the main Drag and Drop Control page. Drag and Drop the required TX window onto the RX for full screen display.

Web-GUI - Picture-in-Picture (PiP) Configuration

Within the MultiView capabilities of the Blustream Multicast Receivers, Picture in Picture scenes can also be configured to display a MultiView image where windows are laid out next to, or overlay a main window on a screen.

Whilst this is similar to MultiView (as described in the last section), the PiP formats can be selected in two different ways during the initial configuration:

- Side by Side - this is a similar process to MultiView where images can be laid out without any overlap of the imagery on screen. Please note: there are less options available in the PiP set up than in MultiView set up. With Side by Side, the main image is always poisitoned to the left hand extent of the screen, with the PiP windows positioned to the right (not overlapping).

- Overlay - this allows for a main stream image to fill the screen with smaller, sub-stream imagery to be placed over the top of the main stream.

As with MultiView, streaming all imagery in its native format (where, for instance, sources are all outputting at 4K), would exceed the maximum bandwidth of the systems overall capabilities. The IP500 series product will automatically downscale the main and/or sub-streams to a lower resolution to avoid the system from being overloaded.

For main stream windows, the image may have to be automatically be down-scaled so that the combined stream data rate doesnt exceed 10Gbps, using the following rules:

- 4K60Hz (4:4:4, 4:2:2, 4:2:0) down to 720p (60Hz or 30Hz) or 540p (60Hz or 30Hz)

- 4K30Hz (4:4:4, 4:2:2) down to 1080p (30Hz), 720p (60Hz or 30Hz) or 540p (60Hz or 30Hz)

- 1080p 60Hz down to 1080p (30Hz), 720p (60Hz or 30Hz) or 540p (60Hz or 30Hz)

There are 8x different possible configurations that can be set up for different PiP Layouts.

To configure a new PiP preset, navigate to the MultiView Configuration menu in the ACM500, and click the button labelled 'MultiView PiP's' (as marked) at the top of the screen:
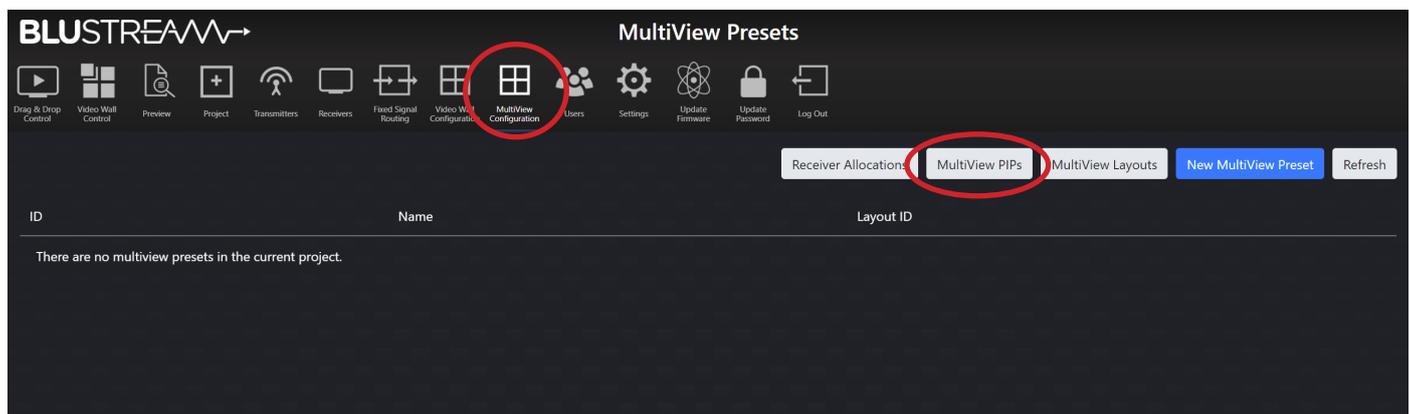
# Web-GUI - Picture-in-Picture (PiP) Configuration

Each MultiView PiP that is created is assigned an ID number and name. The ID numbers for PiP layouts continue sequentially after the (25x) MultiView layouts, starting at 26. The PiP ID will be assigned automatically as the next available number, but an alternative number can be assigned by using the drop-down box.
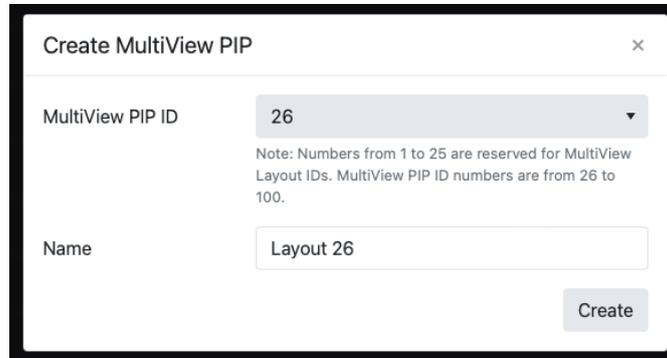
Name the Layout as required using the free-form text box under the ID - this can be left as 'Layout xx' and renamed at a later point if required, and click 'Create'.
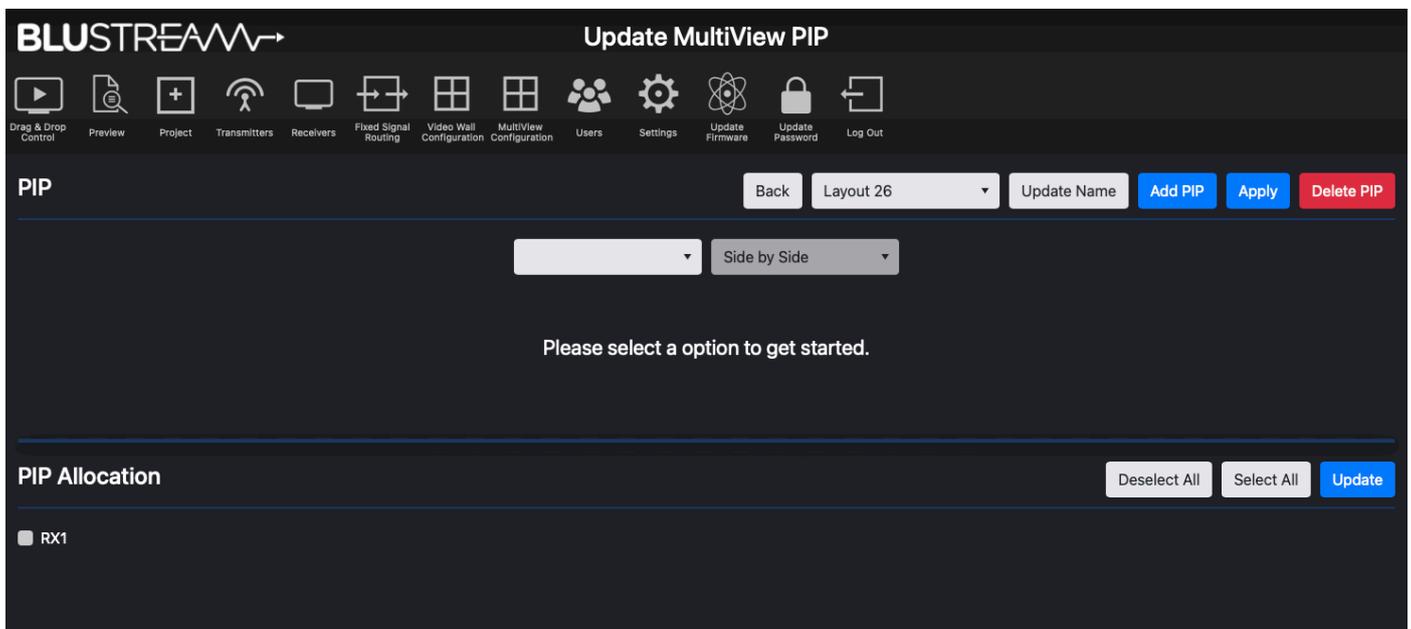
The name of the Layout can be altered using the button marked 'Update Name' at this point if not carried out in the previous step. As mentioned earlier, there are 8x different possible configurations that can be set up for different PiP Layouts. The below table defines arech of the layouts that can be achieved based on the main and sub-stream resolutions and how many sub-streams need to appear on a single display / RX output.

Configuration	Main Window Resolution	Max Sub Windows	Sub Window Resolution	Side-by-Side	Overlay
1	4K 30Hz	1	1080p 60Hz	YES	NO
2	4K 30Hz	2	1080p 30Hz	YES	NO
3	4K 30Hz	2	720p 60Hz	YES	YES
4	4K 30Hz	5	720p 30Hz	YES	YES
5	4K 30Hz	7	540p 30Hz	YES	YES
6	1080p 60Hz	1	720p 60Hz	YES	YES
7	1080p 60Hz	1	720p 30Hz	YES	YES
8	1080p 60Hz	4	540p 30Hz	YES	YES

Web-GUI - Picture-in-Picture (PiP) Configuration

The PiP windows are not adjustable in size or co-ordinate positioning. The size of the individual windows is based on the fixed sub-stream resolution against the resolution of the main stream. Therefore the PiP image will be smaller where a 4K main stream with a 540p sub-stream as the PiP is used. Where the PiP overlay will be larger (cover more of the main srteam image) where a 1080p main stream has a 720p sub-stream as the PiP. Please see below Configuration options:

Configuration 1:

Main Window - 4K 30Hz, and 1x Sub Window - 1080p 60Hz
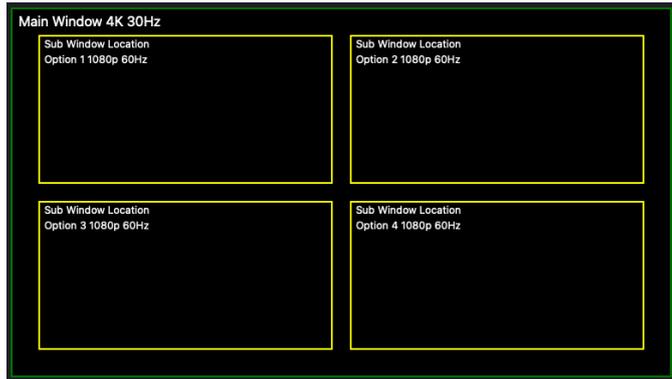
Configuration 2:

Main Window - 4K 30Hz, and up to 2x Sub Windows - 1080p 60Hz
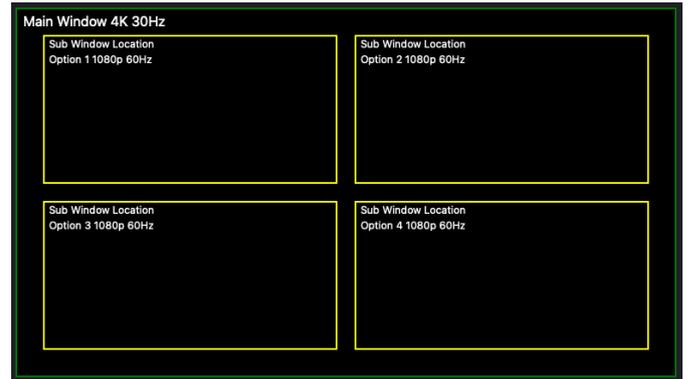
Configuration 3:

Main Window - 4K 30Hz, and up to 2x Sub Windows - 720p 60Hz

Configuration 4:

Main Window - 4K 30Hz, and up to 5x Sub Windows - 720p 30Hz

Configuration 5:

Main Window - 4K 30Hz, and up to 7x Sub Windows - 540p 30Hz

Configuration 6:

Main Window - 1080p 60Hz, and 1x Sub Window - 720p 60Hz

Web-GUI - Picture-in-Picture (PiP) Configuration

Configuration 7:

Main Window - 1080p 60Hz, and 1x Sub Window - 720p 30Hz
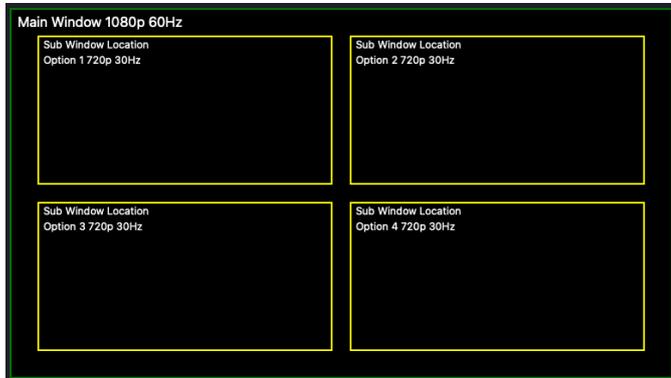
Configuration 8:

Main Window - 1080p 60Hz, and up to 4x Sub Windows - 540p 30Hz

Please note: the graphical representations (as shown previously) of the window sizes within the ACM500 GUI are not to scale, and are not be indicative of exact size (as a ratio), or positioning on the screen.
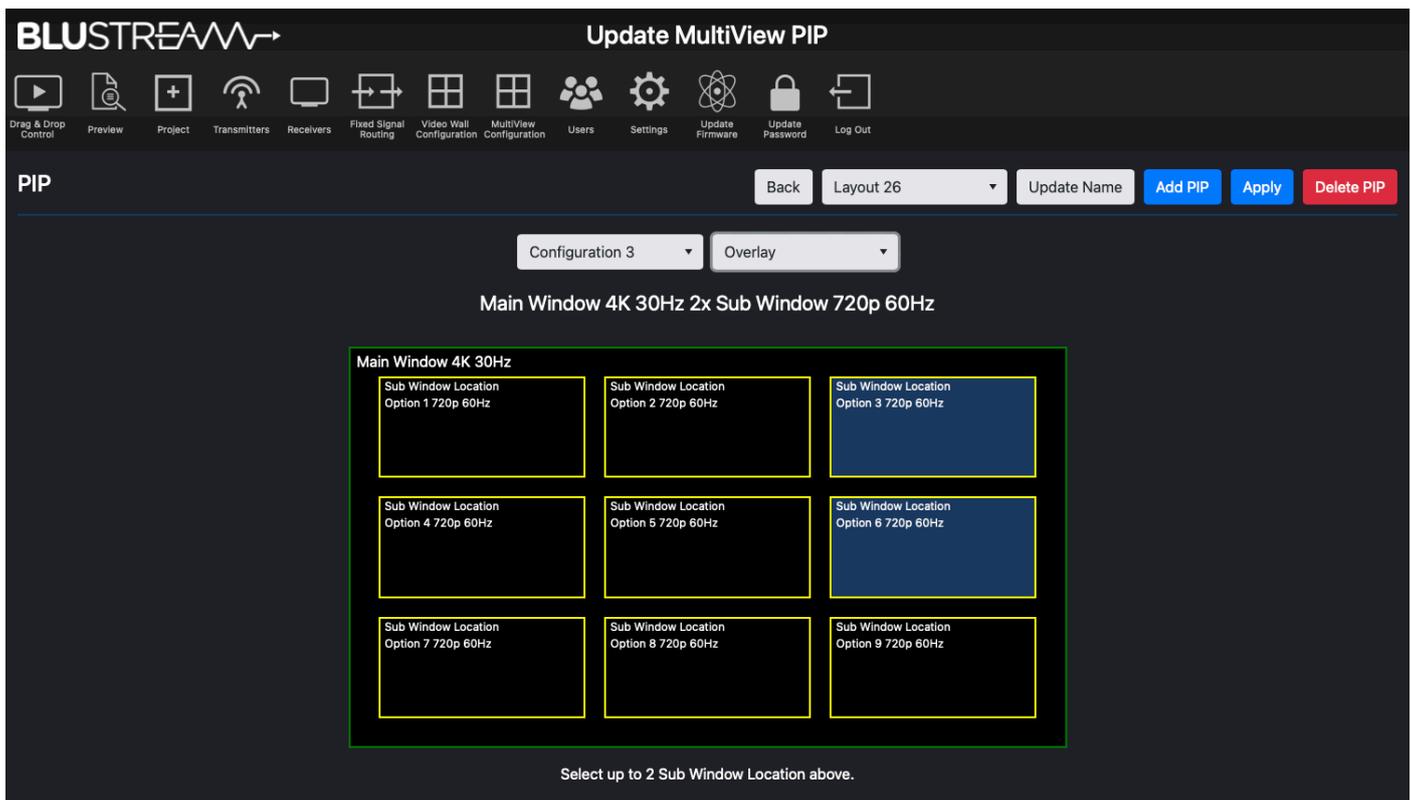

Once the most suitable Configuration has been chosen, select either 'Side by Side' or 'Overlay' from the drop-down box next to the Configuration.

The positions of the PiP windows can then be selected by clicking on where the windows are to appear above the main stream. In the example above, the 'top right' and 'middle right' positions have been chosen. With Configuration 3, only 2x sub (PiP) windows can be chosen. If a third PiP window is required, Configuration 4 would be more suitable, however, the frame rate of the sub-streams would need to be dropped from 60Hz to 30Hz to not exceed the overall bandwidth of the data travelling to the Receiver.

Click 'Apply' at the top fo the screen before moving onto the allocation of which Receivers can allow this PiP configuration..

Web-GUI - Picture-in-Picture (PiP) Configuration

Once the Layout has been configured, navigate ot the bottom of the window to select which Receivers will be given permission to recall the PiP configuration from the Drag and Drop screen:
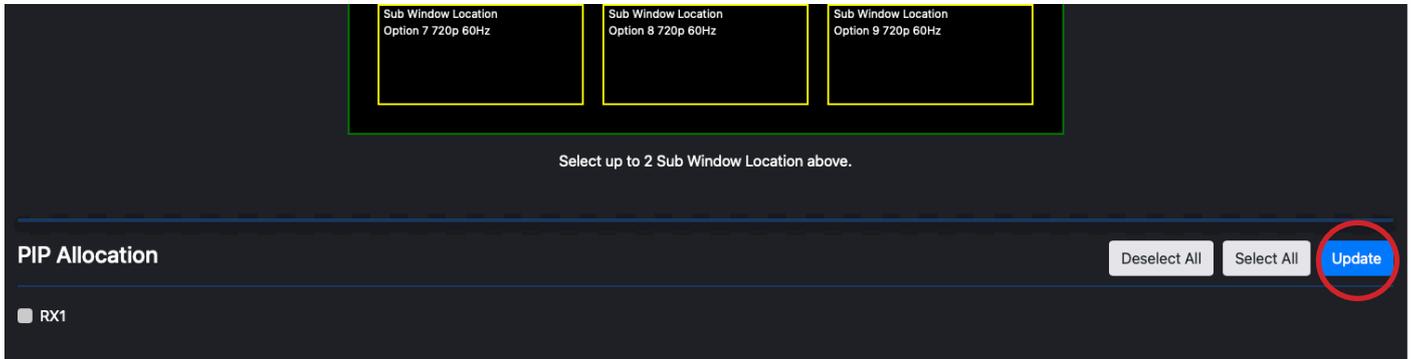
The Receivers will appear as radial buttons (and named as per the name given - in the above example, named 'RX1'). Click next to each RX where this Configuration will be required. Once the required RX's that need to recall this PiP configuration have been selected, click the 'Update' button to the right.

# Web-GUI - Recalling Picture-in-Picture (PiP) Configurations

As with recalling a MultiView configuration, the same process is used for recalling PiP Configurations. Click the MV icon in the top corner of the RX window that has a MultiView or PiP configuration assigned to it.
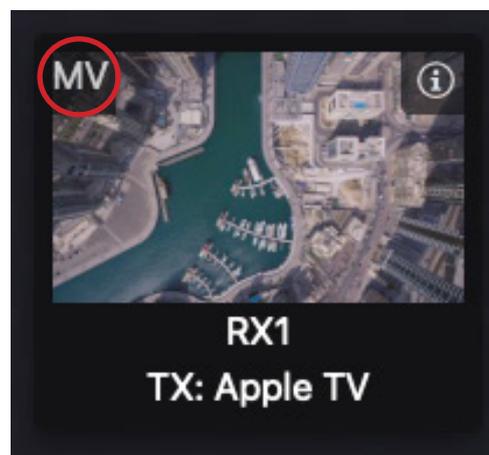
Web-GUI - Recalling Picture-in-Picture (PiP) Configurations

When the MV icon for a specific Receiver has been clicked inside the Drag and Drop menu, a large representation of the RX appears in place of the stock of RX in the system. The MultiView and PiP layouts that have been assigned to that Receiver appear at the bottom of the page. Click on the Layout to apply this to the Receiver.

The thumbnail image of the source currently being watched will disappear and allow for any of the current source devices to be dragged and dropped into the windows available. In the example above, the green window is the Main Stream, and the yellow windows are the sub-stream windows. Simply Drag and Drop the TX / sources into the windows to assign these to this area.
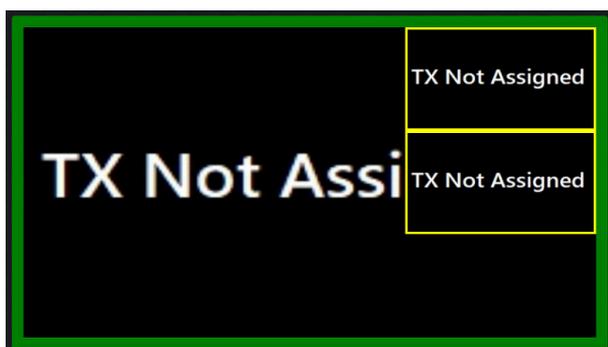
As each source is dropped onto the available window, the thumbnail will appear inside the window. A small button will appear in the corner of the windows. In the green Main Window, MC (Main Clear) will appear, in the yellow Sub Windows, SC (Sub Clear) will appear - clicking these buttons will clear the source assigned to that portion of the screen.

If a source device is only available as a sub-stream it will be because the fixed resolution of this device is out of the resolution range that the MultiView / PiP is currently working in. To allow for a main stream to pass, the resolution must first be amended to suit the main stream resolution.

Web-GUI - Recalling Picture-in-Picture (PiP) Configurations

It is also possible to save the layout with sources in different positions to speed up the recall process, either via the API, or via Drag and Drop thorugh the ACM500.

Assigning sources to specific windows and clicking the button marked 'Save As MultiView Preset' allows for this specific combination of Layout Configuration with the sources assigned to windows to be saved. Name the MultiView Preset as required.
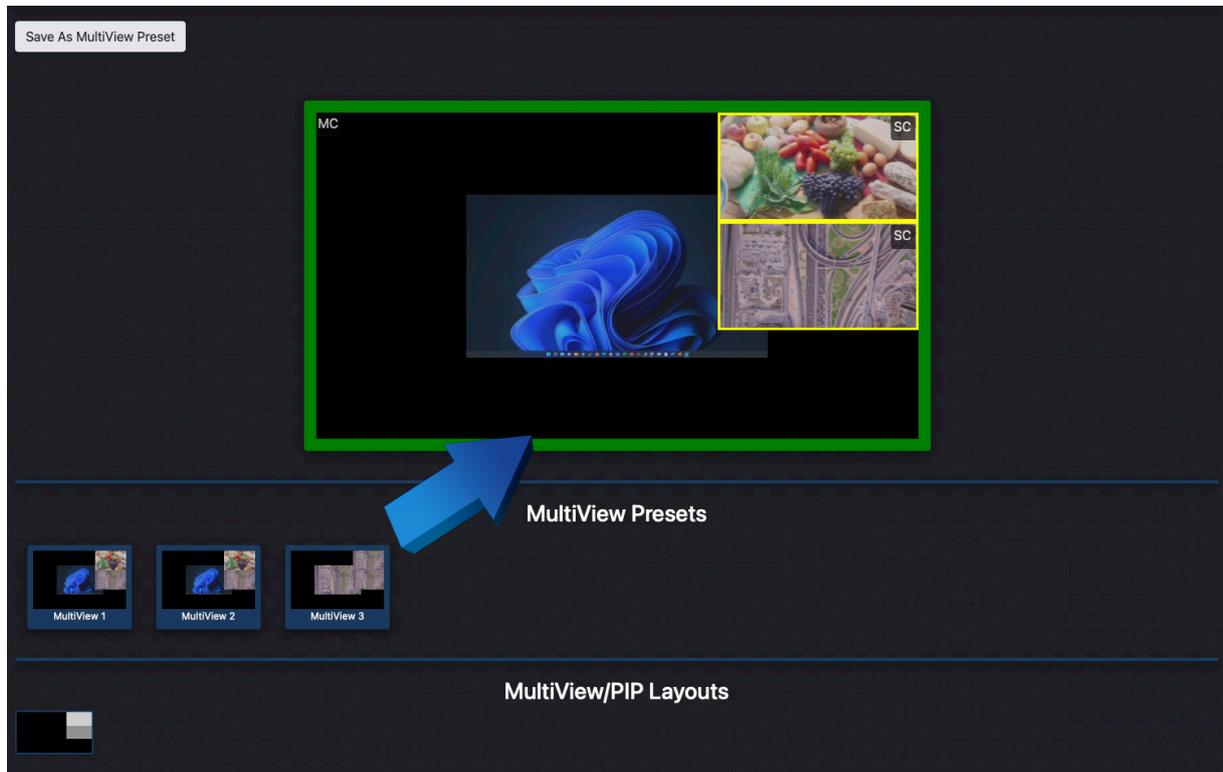

The MultiView Presets will all appear below the main Drag and Drop window. These can be recalled by dragging and dropping the Preset window onto the main RX thumbnail.

Web-GUI - Users

The ACM500 has the ability for individual Users to log into the web-GUI of the Multicast system and access individual parts / zones of the system, for full control of the entire Multicast system, or for simple control of which source is being watched in selected locations only. For assistance setting up new Users, click on the button marked 'Users Help'.

To set-up a new User, click 'New User' at the top of the screen:
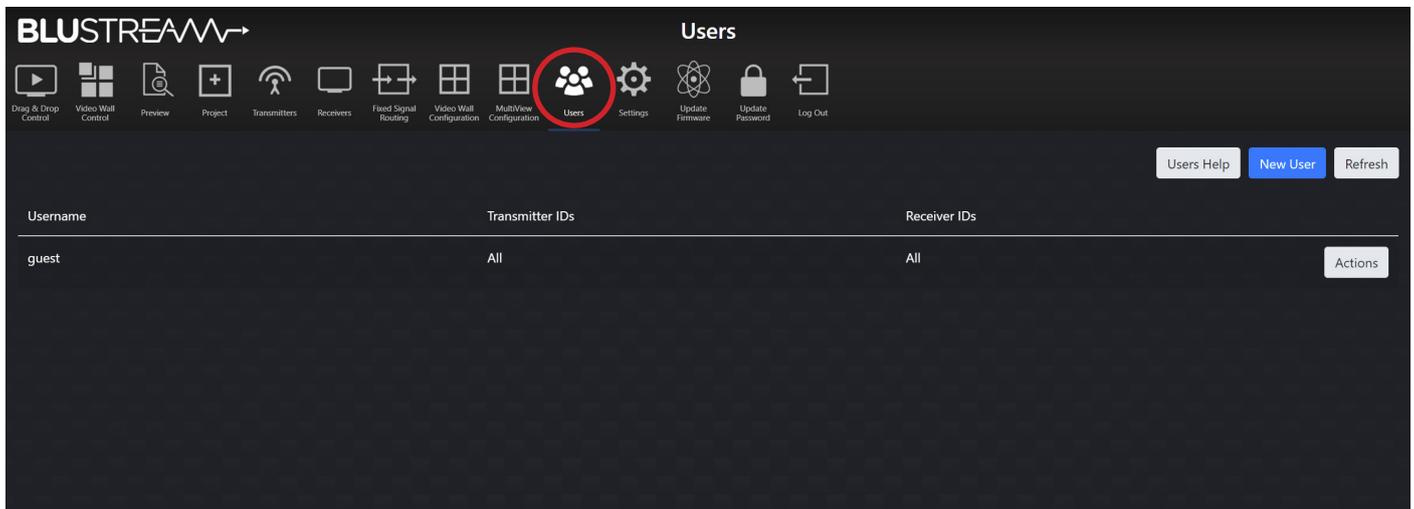
Enter the new User credentials into the window that appears and click 'Create' once completed:
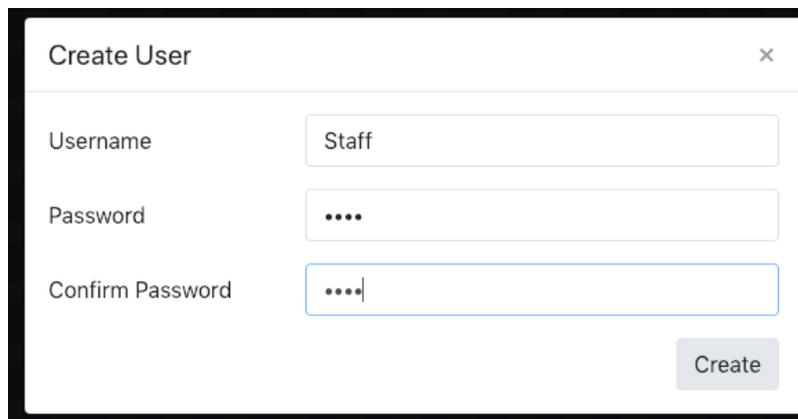
The new User will then appear in the Users menu page ready for access / permissions to be configured:

Web-GUI - Users - continued...

To select individual User permissions, update the User password, or to remove the User from the Multicast system, click the 'Actions' button.
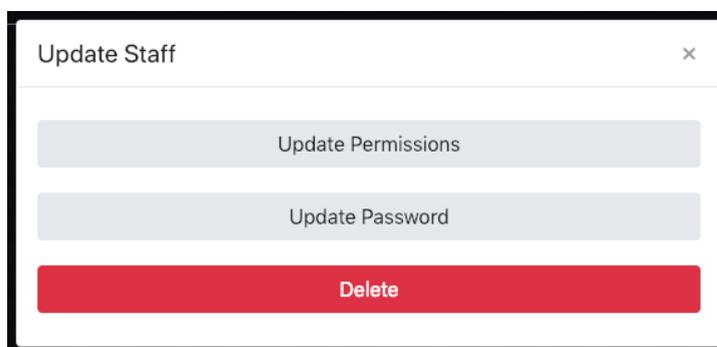
The Permissions option gives access to select which Transmitters or Receivers the User can see within their control pages (Drag & Drop Control, and Video Wall Control). With all boxes checked next to each Transmitter or Receiver, the User can preview and switch across the entire system. If the User is only to be able to control one screen / receiver, then uncheck all other Receivers. Likewise, if the User is not to be given access to one (or more) source devices, these Transmitters should be unchecked.

Where there is a Video Wall array in the Multicast system, a User will need access to **ALL** associated Receivers to be able to gain switching control of the Video Wall. If the User does not have access to all Receivers, the Video Wall will not appear in the Video Wall Control page.
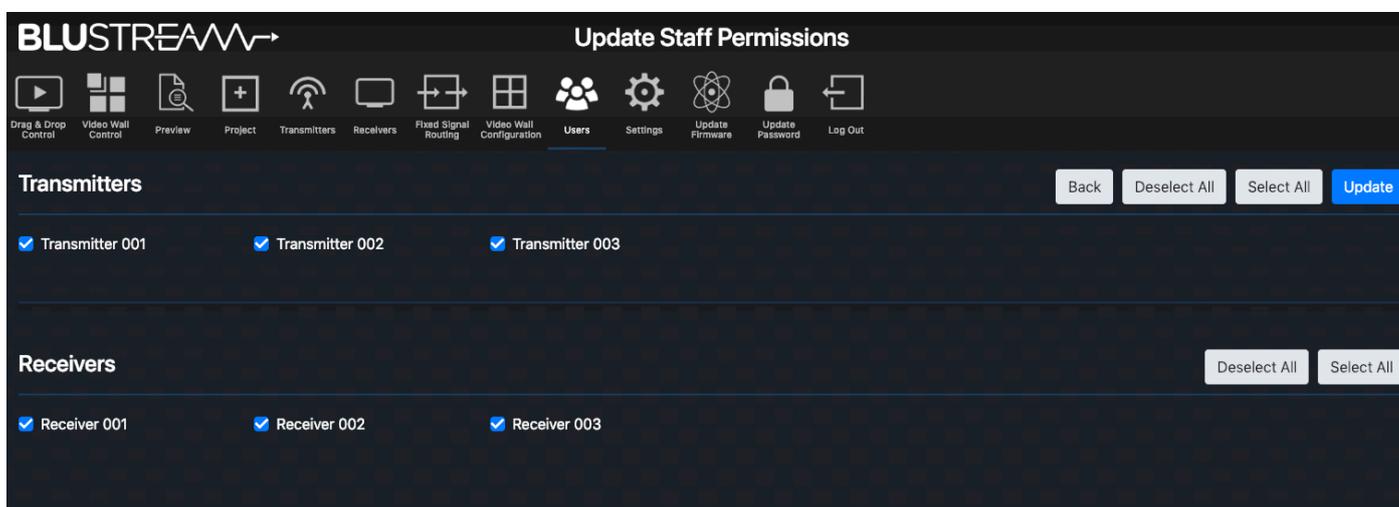
Once the User permissions have been selected, click 'Update' to apply the settings.

Please note: in order to stop non-secure access to the web interface (i.e. with no password), the 'Guest' account must be deleted after a new user with access to the sources / screens applicable set-up. This way, any User of the system is required to enter a password to gain switching control of the system.

Web-GUI - Settings

The Settings page of the ACM500 will provide an overview of the general settings, and control / video network settings of the unit with the ability to amend and update the unit accordingly.
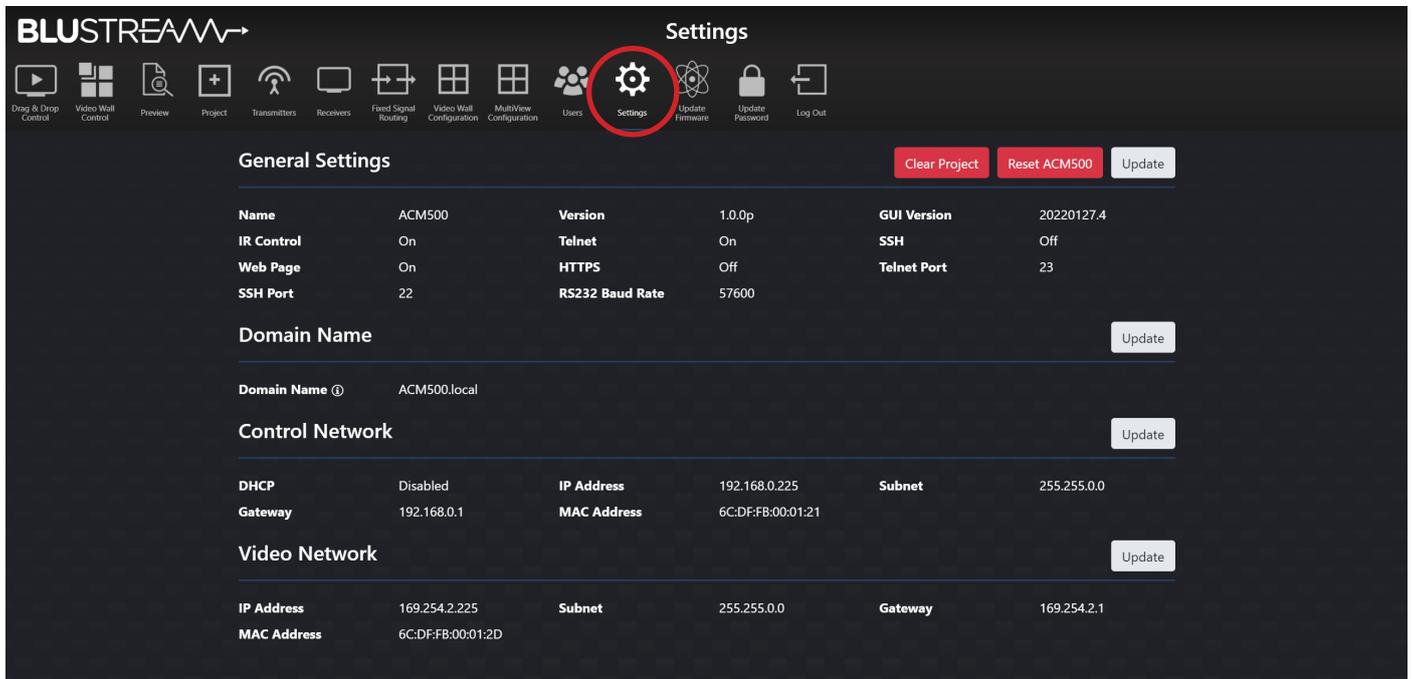
The 'Clear Project' removes all Transmitters, Receivers, Video Walls and Users that have been created from the current project file contained within the ACM500. Confirm by selecting 'Yes'.

Please note: the New Project Setup Wizard will appear after using the 'Clear Project' function. Should a project save file not have been created prior to clearing the project, it is not possible to restore the system after this point.
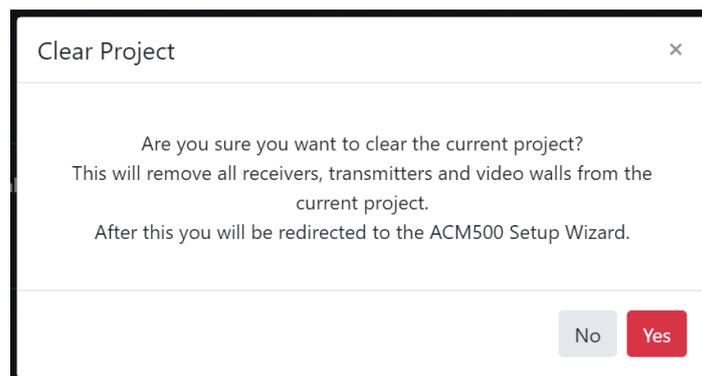
Web-GUI - Settings - continued...

The 'Reset ACM500' option allows for the following:

1. Reset System to factory default *(excludes Network settings)*
2. Reset Network to default settings *(excludes System settings)*
3. Reset ALL System and Network settings back to factory default
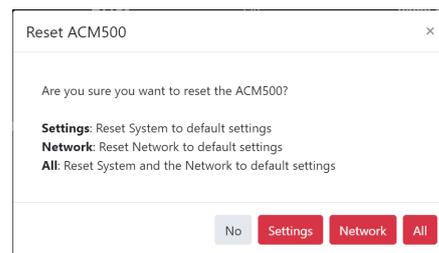
Under general settings, the 'Update' option allows for the following:

1. IR Control On / Off - Enable / disable the IR input of the ACM500 from accepting IR commands from a third party control solution
2. Telnet On / Off - Enable / disable the telnet port of the ACM500 from accepting API commands from a third party control solution
3. SSH On / Off - Enable / disable the SSH port of the ACM500 from accepting API commands from a third party control solution
4. Web Page On / Off - Enable / disable the Web GUI of the ACM500 from being displayed in a web browser
5. HTTPS On / Off - Enable / disable the use of HTTPS instead of HTTP for the Web GUI of the ACM500
6. Update the Telnet port that the Control port of the ACM500 communicates through. The default is port 23 which will be used for all official Blustream third party control drivers
7. Update the SSH port that the Control port of the ACM500 communicates through. The default is port 22
8. Update the RS-232 Baud Rate of the DB9 connection of the ACM500 to suit a third party control processor. The default Baud Rate used is 57600
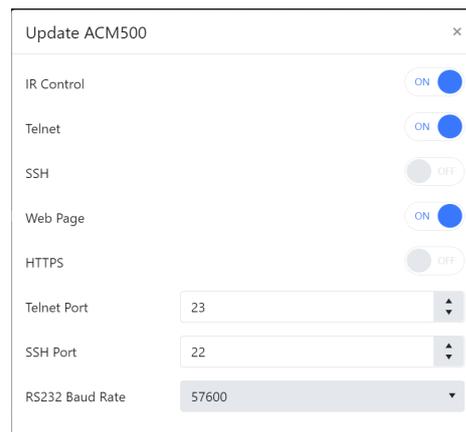
The Domain Name of the ACM500 can also be updated. This is another way to access the device in a web browser should you not know the IP of the unit.
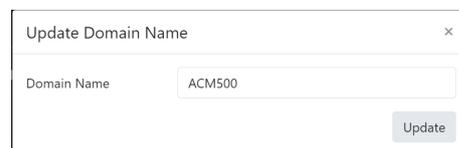
The IP addresses of the two RJ45 ports on the ACM500 can be updated with individual IP, Subnet and Gateway addresses. Use the 'Update' button for either the Control Network or Video Network to update the information for the ports required. The Control Port can be set to DHCP by selecting 'On':
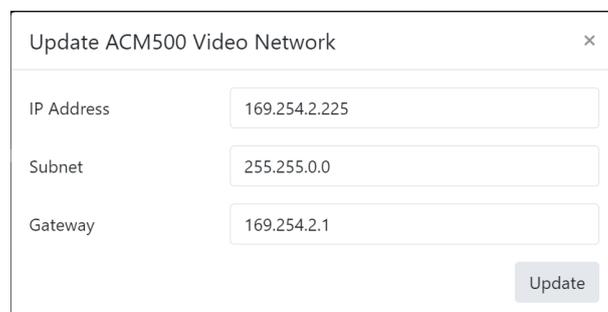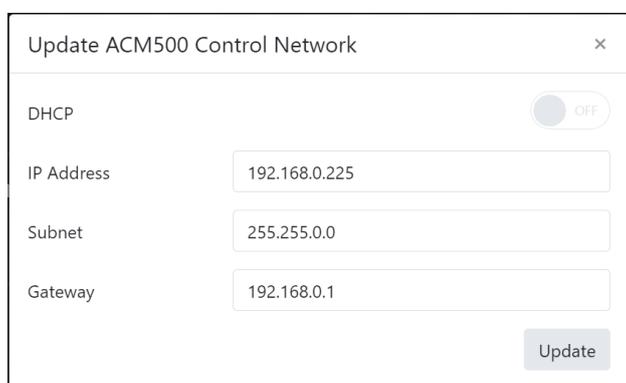
IMPORTANT: Amending the Video Network IP Address out of the 169.254.x.x range will stop communication between the ACM500 and the Multicast Transmitters and Receivers that have been pre-configured. Whilst the ACM500 can be moved out of the recommended range, the IP addresses of ALL Transmitters and Receivers would need to be amended to the same IP range to ensure connectivity and control of the Multicast system. **Not recommended.**

Web-GUI - Update Firmware

The Update Firmware page allows for the firmware updating of:

• The ACM500 unit

• IP500 Multicast Transmitter and Receiver units MCU firmware, SS firmware and NXP firmware

Please note: firmware packages for the ACM500, Multicast Transmitter and Receiver products are individual. It is recommended that firmware updating is only completed from a desktop or laptop PC that is hard-wired into the network.

Updating the ACM500:

Download the ACM500 Firmware file (.bin) from the Blustream website to your computer.
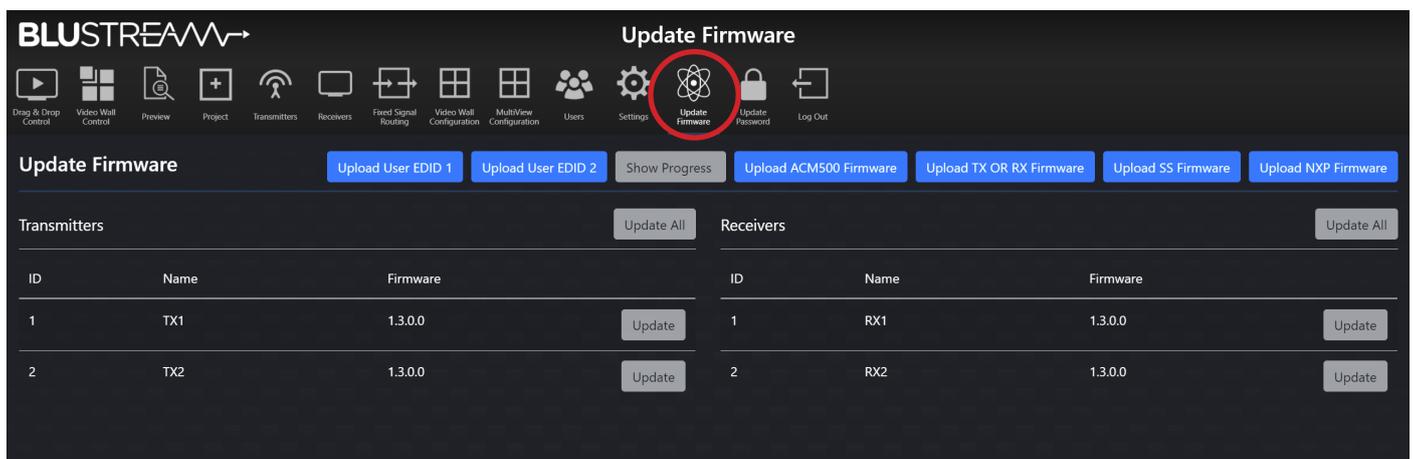
Click on the buttom marked 'Upload ACM500 Firmware'

Select the [ACM500].bin file already downloaded to your computer for the ACM500. The file will automatically upload to the ACM500 which takes approximately 2 minutes to complete. The page refreshes to the Drag & Drop page once complete.

Web-GUI - Update Firmware - continued...

The Update Firmware page is also used for upgrading the firmware of Blustream IP500UHD-TZ Transceivers. The most current firmware version for the Multicast devices can be downloaded from the Blustream website.
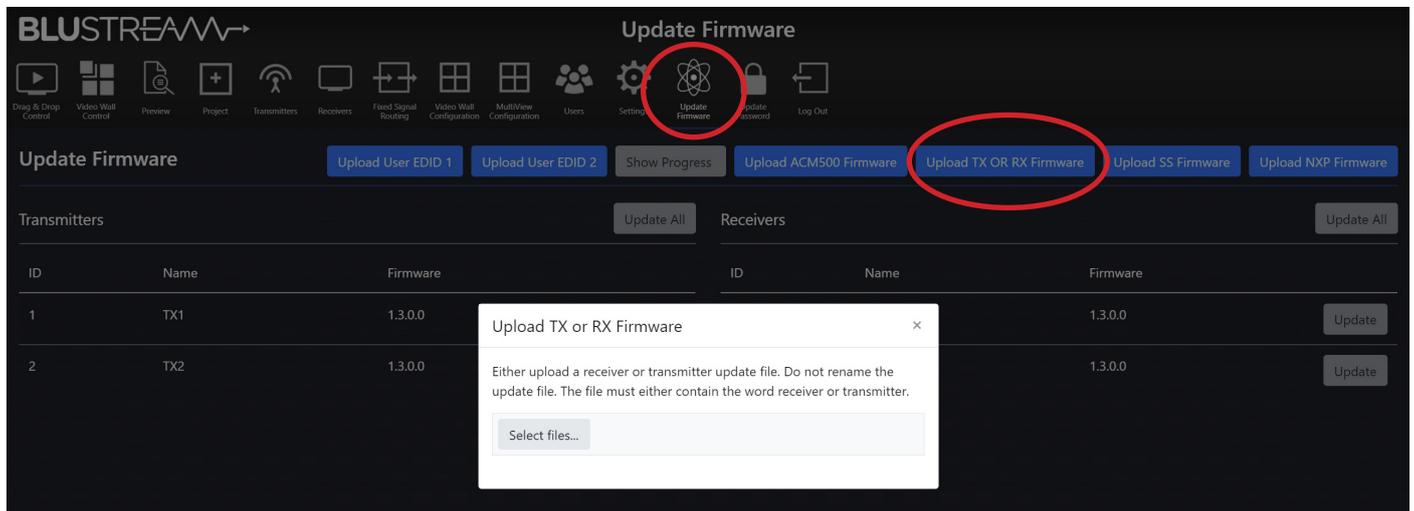
To upload the firmware files, click the button marked 'Upload TX or RX Firmware', then 'Select Files'. Once the correct firmware (.bin) file has been selected from the computer, the firmware will upload to the ACM500.

Please note: this part of the upgrade does not upload the firmware into the TX or RX units, it only uploads to the ACM500 ready for deployment to the TX or RX.
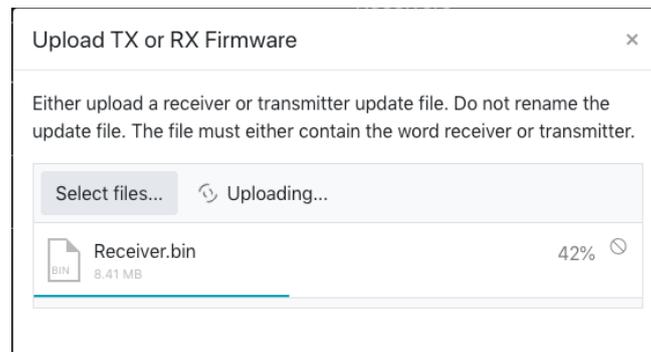
IMPORTANT: Do not close or navigate away from the upload whilst in progress to avoid firmware data being lost during transfer to the ACM500.

Web-GUI - Update Firmware - continued...

On completion of the firmware files being uploaded to the ACM500, a notification will appear on screen to feedback the success of the upload:

⊘ The device firmware (Receiver-HDN-EB100ATBS-AVP-AU0888-V1.3.0.0.bin) has been uploaded, please select a device to start the update.
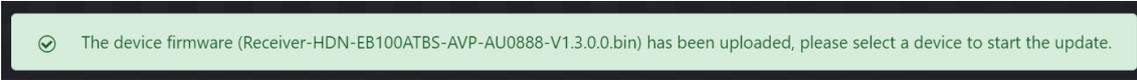
To complete the upgrade of the firmware of either the Multicast Transmitter, or for Receiver units, click the buttom marked 'Update' next to the relevant Transmitter or Receiver. **Please note:** it is only possible to update Transmitters, or Receivers at one time. The firmware upgrade process will then begin:
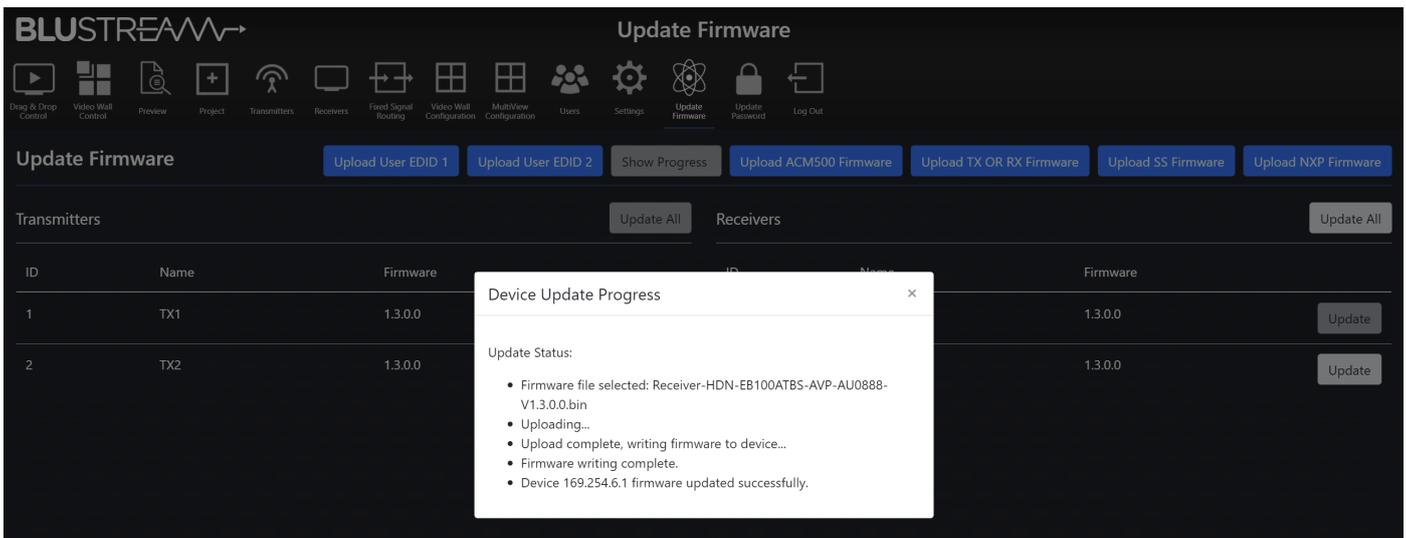
IMPORTANT: Do not disconnect the ACM500 or TX / RX units whilst in the upgrade process is in progress to avoid firmware data being lost during transfer to the individual Transmitter / Receiver devices.

Update Password

The Admin password for the ACM500 can be updated to an alpha-numeric password by inserting the new credentials in this pop-up menu option. Click 'Update Password' to confirm:

IMPORTANT: Once the Admin password has been changed, it cannot be recovered by the User. If the Admin password is forgotten or lost, please contact a member of the Blustream Technical Support team who will be able to assist in the recovery of the Admin rights of the unit. See email addresses below:

RS-232 (Serial) Routing

The Multicast system features two ways of managing RS-232 command signals:

Type 1 - Fixed Routing:

A static fixed routing for distributing two-way RS-232 commands between a Multicast Transmitter to one multiple Receivers (Fixed Routing). Fixed routing can be left static between two or more products as a permanent connection for the transfer of RS-232 control data, this is configured using the Fixed Routing menu of the ACM500.

Type 2 - Guest Mode:

Allows the RS-232 connection of a device to be sent over the IP network (IP / RS-232 command in, to RS-232 out). Type 2 Guest Mode gives third party control systems the ability to send an RS-232 or IP command to the ACM500 and an RS-232 command to be sent out of a Receiver or Transmitter as a result. This IP to RS-232 signalling, allows the third party control system to have control of as many RS-232 devices as there are Receivers and Transmitters, from the network connection to the ACM500.

There are two ways of enabling Type 2 - Guest Mode:

1. Using the ACM500 web-GUI. See page 20 for enabling Guest Mode on a Tranmsitter and page 23 for enabling Guest Mode on a Receiver unit.

2. Via the command set as detailed below. The command to configure the connection is: **IN/OUT xxx SG ON**

RS-232 Guest Mode Connection from a Third Party Control System:

When using Guest Mode on multiple devices within a system, we would recommend turning Guest Mode on and off when required. This is because a serial command being sent into the ACM500 will be passed to ALL devices that have Guest Mode enabled.

1.   To open a Guest Mode connection between the ACM500 and an IPxxxUHD-TX or RX unit the following command must be sent via IP or RS-232:

   INxxxGUEST   Connect to TX xxx in Guest Mode from the ACM500

   OUTxxxGUEST   Connect to RX xxx in Guest Mode from the ACM500

   Example: Transmitter ten is ID 010, meaning 'IN010GUEST' will allow bi-directional Serial / IP commands to be sent between the ACM500 and Transmitter 10.

2.   Once a connection is established, any characters that are sent from the ACM500 will be transmitted to the connected Transmitter or Receiver, and vice versa.

3.   To close the connection send the escape command: 0x02 (02 in Hex). If using Telnet, the connection can also be closed by pressing: CTRL + B.

Specifications

ACM500

- **Ethernet Port:** 2 x LAN RJ45 connector (1 x PoE support)
- **RS-232 Serial Port:** 2 x 3-pin Phoenix connector
- **I/O Port:** 1 x 6-pin Phoenix connector (reserved for future use)
- **IR Input:** 1 x 3.5mm stereo jack
- **Product Upgrade:** 1 x Micro USB
- **Dimensions (W x D x H):** 190.4mm x 93mm x 25mm
- **Shipping Weight:** 0.6kg
- **Operating Temperature:** 32°F to 104°F (0°C to 40°C)
- **Storage Temperature:** -4°F to 140°F (-20°C to 60°C)
- **Operating Altitude:** < 2000m
- **Power Supply:** PoE or 12V 1A DC (sold separately) where PoE not delivered by LAN switch

NOTE: Specifications are subject to change without notice. Weights and dimensions are approximate.

Package Contents

ACM500

- 1 x ACM500
- 1 x IR Control Cable - 3.5mm to 3.5mm Cable
- 1 x Mounting kit
- 4 x Rubber feet
- 1 x Quick Reference Guide

Maintenance

Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner or benzene to clean this unit.

Blustream Infrared Commands

Blustream have created 16x input & 16x output IR commands allowing source selection of up to 16x IPxxxUHD-TX Transmitters on up to 16x IPxxxUHD-RX Receivers. These are different to the source switching controls sent to a Multicast Receiver.

For systems larger than 16x source devices (IPxxxUHD-TX), please use RS-232 or TCP/IP control.

For the complete database of Multicast IR commands, please visit the Blustream website page for any Multicast product, click on the "Drivers & Protocols" button, and navigate to the folder named "Multicast IR Control".

RS-232 and Telnet Commands

The Blustream Multicast system can be controlled via serial and TCP/IP. Please refer to the RS-232 connections page towards the start of this manual for settings and pin out. The following pages list all available serial commands for the Multicast solution when using the ACM500.

Common Mistakes

- Carriage return – Some programs do not require the carriage return where as other will not work unless sent directly after the string. In the case of some Terminal software the token <CR> is used to execute a carriage return. Depending on the program you are using this token maybe different. Some other examples that other control systems deploy include \r or 0D (in hex).

- Spaces – the ACM500 can work with our without spaces. It simply ignores them. It can also work with 0 to 4 digits.

       eg: 1 is the same as 01, 001, 0001

     - How the string should look is as follows OUT001FR002

     - How the string may look if spaces are required by the control system: OUT{Space}001{Space}FR002

- Baud Rate or other serial protocol settings not correct

Blustream ACM500 commands and feedback

The following pages list the common API commands that will be required for third party control systems

Please note: the maximum number of Transmitters (yyy) and Receivers (xxx) = 762 devices (001-762)

     - Receivers (outputs) = xxx

     - Transmitters (inputs) = yyy

     - Scaler Output = rr

     - EDID Input settings = zz

     - Baud Rate = br

     - GPIO input/output ports = gg

For a full list of all API commands for the ACM500, please see separate Advanced Control Module API Document published on the Blustream website. You can also send the HELP command to the ACM500 and it will print a full list of API.

Receiver (Output) Commands

COMMAND DESCRIPTION	COMMAND	RESPONSE
Set OUTPUT:xxx From INPUT:yyy (ALL signals routed)	OUTxxxFRyyy	Set output xxx from input yyy.
Fix VIDEO OUTPUT:xxx From INPUT:yyy	OUTxxxVFRyyy	Set output video xxx from input yyy.
Fix AUDIO OUTPUT:xxx From INPUT:yyy	OUTxxxAFRyyy	Set output audio xxx from input yyy.
Fix IR OUTPUT:xxx From INPUT:yyy	OUTxxxRFRyyy	Set output IR xxx from input yyy.
Fix RS232 OUTPUT:xxx From INPUT:yyy	OUTxxxSFRyyy	Set output RS232xxx from input yyy.
Fix USB OUTPUT:xxx From INPUT:yyy	OUTxxxUFRyyy	Set output USB xxx from input yyy.
Fix CEC OUTPUT:xxx From INPUT:yyy	OUTxxxCFRyyy	Set output CEC xxx from input yyy.
Set CEC OUTPUT:xxx ON or Off	OUTxxxCECON/OFF	Set output xxx CEC mode ON/OFF.
Send Output xxx CEC Command POWERON	OUTxxxCECPOWERON	Output xxx CEC command power on.
Send Output xxx CEC Command POWEROFF	OUTxxxCECPOWEROFF	Output xxx CEC command power off.
Send Output xxx CEC Command VIDEOLEFT	OUTxxxCECVIDEOLEFT	Output xxx CEC command video left.
Send Output xxx CEC Command VIDEORIGHT	OUTxxxCECVIDEORIGHT	Output xxx CEC command video right.
Send Output xxx CEC Command VIDEOUP	OUTxxxCECVIDEOUP	Output xxx CEC command video up.
Send Output xxx CEC Command VIDEODOWN	OUTxxxCECVIDEODOWN	Output xxx CEC command video down.
Send Output xxx CEC Command VIDEOENTER	OUTxxxCECVIDEOENTER	Output xxx CEC command video enter.
Send Output xxx CEC Command VIDEOMENU	OUTxxxCECVIDEOMENU	Output xxx CEC command video menu.
Send Output xxx CEC Command VIDEOBACK	OUTxxxCECVIDEOBACK	Output xxx CEC command video back.
Send Output xxx CEC Command BACKWARD	OUTxxxCECBACKWARD	Output xxx CEC command backward.
Send Output xxx CEC Command FORWARD	OUTxxxCECFORWARD	Output xxx CEC command forward.
Send Output xxx CEC Command PLAY	OUTxxxCECPLAY	Output xxx CEC command play.
Send Output xxx CEC Command VIDEOREW	OUTxxxCECVIDEOREW	Output xxx CEC command video rew.
Send Output xxx CEC Command FASTFORWARD	OUTxxxCECVIDEOFF	Output xxx CEC command fast forward.
Send Output xxx CEC Command PAUSE	OUTxxxCECPAUSE	Output xxx CEC command pause.
Send Output xxx CEC Command VIDEOSTOP	OUTxxxCECVIDEOSTOP	Output xxx CEC command video stop.
Send Output xxx CEC Command VOLUMEDOWN	OUTxxxCECVOLUMEDOWN	Output xxx CEC command volume down.
Send Output xxx CEC Command VOLUMEUP	OUTxxxCECVOLUMEUP	Output xxx CEC command volume up.
Send Output xxx CEC Command MUTE	OUTxxxCECMUTE	Output xxx CEC command mute.
Set Output xxx Show ID OSD On Display Always On Or For 90 Seconds Or Off	OUTxxxOSDON/OFF	Show/Hide OSD on output xxx.
Set Output xxx Flash DEC LED Always On Or For 90 Seconds Or Off	OUTxxxFLSON/OFF	Disable/Flash DEC LED on output xxx.
Set Output xxx Mute On Or Off	OUTxxxMUTEON/OFF	Set output xxx mute On or Off.
Reboot Receiver	OUTxxxRB	Set output xxx reboot and apply all the new config
Switch Receiver (Output) between Matrix and Video Wall mode	OUTxxxMODEMX/VW/MV	Set output xxx to matrix/video wall/multiview mode
Set Output xxx Display Mode To 0 or 1 [0: Fast Switch 1: Genlock]	OUTxxxDISPLAYMODE0/1	Set output xxx display mode Genlock/FastSwitch.
Set Output xxx To Transmitter Mode	OUTxxxTXMODE	Set Output xxx to Transmitter Mode.
Set Output xxx Aspect Ratio To Fit To Screen Or Maintain Aspect Ratio	OUTxxxASPECTFIT/MAINTAIN	Set output xxx Maintain Aspect Ratio/Fit to Screen
Set Scaler Output Resolution 0:Bypass 11:3840x2160@50Hz 1:1280x720@50Hz 12:3840x2160@60Hz 2:1280x720@60Hz 13:4096x2160@24Hz 3:1920x1080@24Hz 14:4096x2160@25Hz 4:1920x1080@25Hz 15:4096x2160@30Hz 5:1920x1080@30Hz 16:4096x2160@50Hz 6:1920x1080@50Hz 17:4096x2160@60Hz 7:1920x1080@60Hz 18:1280x768@60Hz 8:3840x2160@24Hz 19:1360x768@60Hz 9:3840x2160@25Hz 20:1680x1050@60Hz 10:3840x2160@30Hz 21:1920x1200@60Hz	OUTxxxRESrr	Set output xxx resolution to rr.
Single Receiver (output) status	OUTxxxSTATUS	(See status example at end of document)

Transmitter (Input) Commands

| COMMAND DESCRIPTION	COMMAND	RESPONSE
Set CEC INPUT:yyy ON or Off	INyyyCECON/OFF	Set input xxx cec mode ON/OFF
Set TX Audio source to HDMI audio	INyyyAUDORG	Set Audio source:xxx to audio select hdmi
Set TX Audio source to Analog	INyyyAUDANA	Set Audio source:xxx audio select analog
Set TX Audio source to Auto	INyyyAUDAUTO	Set Audio source:xxx audio select auto
Reboot Transmitter	INyyyRB	Set output xxx reboot and apply all the new config
Copy EDID Input yyy from Output xxx	EDIDyyyCPxxx	Copy outputxxx edid to input yyy
Set Input: yyy EDID To EDID:zz 　　zz=00: HDMI 1080p@60Hz, Audio 2CH PCM 　　zz=01: HDMI 1080p@60Hz, Audio 5.1CH PCM/DTS/ DOLBY 　　zz=02: HDMI 1080p@60Hz, Audio 7.1CH PCM/DTS/DOLBY/HD 　　zz=03: HDMI 1080i@60Hz, Audio 2CH PCM 　　zz=04: HDMI 1080i@60Hz, Audio 5.1CH PCM/DTS/DOLBY 　　zz=05: HDMI 1080i@60Hz, Audio 7.1CH PCM/DTS/DOLBY/HD 　　zz=06: HDMI 1080p@60Hz/3D, Audio 2CH PCM 　　zz=07: HDMI 1080p@60Hz/3D, Audio 5.1CH PCM/DTS/DOLBY 　　zz=08: HDMI 1080p@60Hz/3D, Audio 7.1CH PCM/DTS/DOLBY/HD 　　zz=09: HDMI 4K@30Hz 4:4:4, Audio 2CH PCM 　　zz=10: HDMI 4K@30Hz 4:4:4, Audio 5.1CH DTS/DOLBY 　　zz=11: HDMI 4K@30Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD 　　zz=12: DVI 1280x1024@60Hz, Audio None 　　zz=13: DVI 1920x1080@60Hz, Audio None 　　zz=14: DVI 1920x1200@60Hz, Audio None 　　zz=15: HDMI 4K@30Hz 4:4:4, Audio 7.1CH(Default) 　　zz=16: HDMI 4K@60Hz 4:2:0, Audio 2CH PCM 　　zz=17: HDMI 4K@60Hz 4:2:0, Audio 5.1CH DTS/DOLBY 　　zz=18: HDMI 4K@60Hz 4:2:0, Audio 7.1CH DTS/DOLBY/HD	EDIDyyyDFzz	Set input yyy edid with default edid zz
Single Transmitter (input) status	INyyySTATUS	(See status example at end of document)

Video Wall Commands

Video wall configurations will be setup in the ACM500 Web GUI

Each video wall setup will include the following:

- Video wall creation = each Multicast system can include up to 9x separate video walls (01-09)
- Configuration = individual configurations of screens within a video wall. An example of a configuration would be all screens assigned as a single video wall, all screens configured as individual displays, multiple video walls configured within a larger video wall (video wall groups – see below) (01-09)
- Groups = a video wall group is the 'Grouping' of Multicast receivers within a video wall allowing simplified source selection and configuration recall of more than one Multicast Receiver at the same time (A-J)

Video Wall 1 Configuration 1
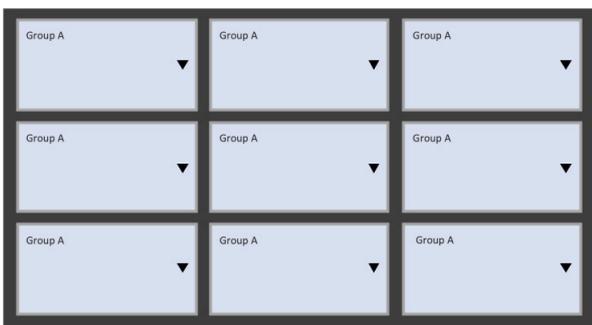
Video Wall 2 Configuration 2
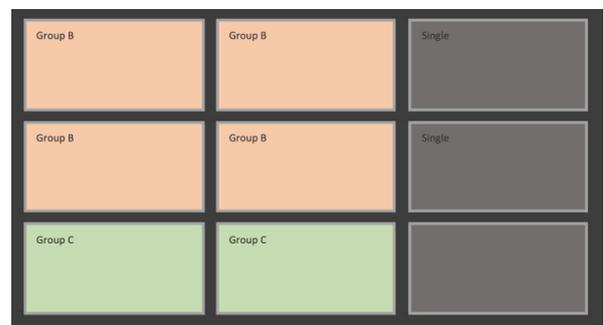
Example of control commands:

- VW01C01APPLY (will apply video wall configuration 1 above to all Receivers)
- VW01C02APPLY (will apply video wall configuration 2 above to all Receivers)
- VW01C01GaFR002 (will apply video configuration 1 and switch all screens to Transmitter 002
- VW01C02GbFR006 (will apply video configuration 1 and switch group b screens [orange] to Transmitter 006

When recalling video wall configurations the following applies:

Characters:
    idx = [01...09]   - Video Wall Index / Number
    cidx = [01...09]   - Config Index / Number
    gidx = [A...J]   - Group Index / Number

COMMAND DESCRIPTION	COMMAND	RESPONSE
Apply Config to Video Wall	VW idx C cidx APPLY	Apply config: Configuration cidx
Set Grouped Output from Single Source INPUT:yyy	VW idx C cidx G gidx FR yyy	[SUCCESS] Done
ALL video wall status	VWSTATUS	(See status example at end of document)
Single Video Wall status	VWidxSTATUS	(See status example at end of document)

General ACM500 Commands

COMMAND DESCRIPTION	COMMAND	RESPONSE
Print all available commands of ACM500	HELP	(See HELP summary at end)
Turn IR control port On or Off	IRON/OFF	Set IR ON/OFF

Turn On Serial Guest Mode to Receiver (output) (NOTE: This only puts the RX into Serial Guest mode but doesn't open the connection. Please use command below)
  br =0: 300
  br=1: 600
  br=2:1200
  br=3: 2400
  br=4: 4800
  br=5: 9600
  br=6: 19200
  br=7: 38400
  br=8: 57600
  br=9: 115200
  bit= Data Bits + Parity + Stop Bits
    Example: 8n1
    Data Bits=[5...8], Parity=[n o e], Stop Bits=[1..2]
	OUTxxxSGON/OFF[br][bit]	Set serial guest mode config done

Serial Guest Mode to Transmitter (input) (details as above)	INxxxSGON/OFF[br][bit]	Set serial guest mode config done
Start Serial Guest Mode To Output ooo	OUT ooo GUEST	(no feedback when in guest mode)
Start Serial Guest Mode To Input ooo	IN ooo GUEST	(no feedback when in guest mode)
Close Serial Guest Mode	CLOSEACMGUEST	[Success] Exit guest

Set IO ports for use as input or output port
  gg=0: select all ports
  gg=01...04: select single IO port
	GPIOggDIRIN/OUT	Set GPIO gg as input/output port

Set IO port to low(0) or high(1) level	GPIOggSET0/1	
Get IO port real input level	GPIOggGET	Get GPIO gg real input level 0/1
IO port status	GPIOggSTATUS	(See status example at end of document)
System status summary	STATUS	(See status example at end of document)
When command fails		unkown param. Type "HELP" for more reference Output xxx does not exist (RX has not been configured) Input yyy does not exist (TX has not been configured) Output xxx is offline Input yyy is offline Param range error (outside of given settings)

Status feedback samples

Command: STATUS

The STATUS feedback gives an overview of the network the ACM500 is connected to:

```
==============================================================

IP Control Box ACM500 Status Info
FW Version: 1.14

Power  IR    Baud
On     On    57600
In    EDID    IP           NET/Sig
001   DF009   169.254.003.001 On /On
002   DF016   169.254.003.002 On /On

Out   FromIn IP           NET/HDMI Res Mode
001   001    169.254.006.001 On /Off  00  VW02
002   002    169.254.006.002 On /Off  00  VW02

LAN    DHCP  IP           Gateway       SubnetMask
01_POE Off   169.254.002.225 169.254.002.001 255.255.000.000
02_CTRL Off  010.000.000.225 010.000.000.001 255.255.000.000

Telnet LAN01 MAC        LAN02 MAC
0023   34:D0:B8:20:4E:19    34:D0:B8:20:4E:1A


==============================================================
```

Command: OUT xxx STATUS

The OUT xxx STATUS feedback gives an overview of the output (Receiver: xxx). Including: firmware, mode, fixed routing, name etc.

```
==============================================================

IP Control Box ACM500 Output Info
FW Version: 1.14

Out  Net  HPD  Ver   Mode Res Rotate Name
001  On   Off  A7.3.0 VW   00   0     Receiver 001

Fast  Fr  Vid/Aud/IR_/Ser/USB/CEC    HDR  MCas
On    001 001/004/000/000/002/000     On   On

CEC  DBG  Stretch IR   BTN LED   SGEn/Br/Bit
On   On   Off     On   On  3     Off /9/8n1

IM    MAC
Static 00:19:FA:00:59:3F

IP           GW           SM
169.254.006.001  169.254.006.001  255.255.000.000

==============================================================
```

Status feedback samples

Command: IN xxx STATUS

An overview of the input (Transmitter: xxx). Including: firmware, audio, name etc.

```
==============================================================

IP Control Box ACM500 Input Info

FW Version: 1.14

In   Net  Sig  Ver    EDID   Aud   MCast  Name
001  On   On   A7.3.0  DF015  HDMI  On     Transmitter 001

CEC   LED  SGEn/Br/Bit
On    3    Off /9/8n1

IM     MAC
Static  00:19:FA:00:58:23

IP              GW              SM
169.254.003.001  169.254.003.001  255.255.000.000

==============================================================
```

Command: VW STATUS

The VW STATUS will show all VW status feedback for Video Wall arrays in the system. Additional Video Wall arrays will have individual status feedback i.e. 'VW 2 STATUS'.

```
==============================================================

 IP Control Box ACM500 Video Wall Info

FW Version: 1.14

VW  Col  Row  CfgSel  Name
02  02   02   02      Video Wall 2

OutID
001 002 003 004

 CFG   Name
 01     Configuration 1

Group  FromIn  Screen
A      004     H01V01 H02V01 H01V02 H02V02

02             Configuration 2

Group  FromIn  Screen
A      002     H02V01 H02V02
B      001     H01V01 H01V02

==============================================================
```

Troubleshooting the ACM500

Try using the below instructions to test the ACM500 should difficulties be encountered when using a computer to control the ACM500.

1.   Connect the computer directly to the ACM500 Control Port with a CAT cable

2.   The computer must be in the same range as the LAN connection 1 on the ACM500 device (CONTROL network) as this will simulate the control from a third party control system (i.e. Control4, RTI, ELAN etc). Please see instructions at the rear of this manual for 'Changing your computer IP details'.

3.   Open cmd.exe program (Command prompt). Use the search tool of the computer if unsure where this is located.
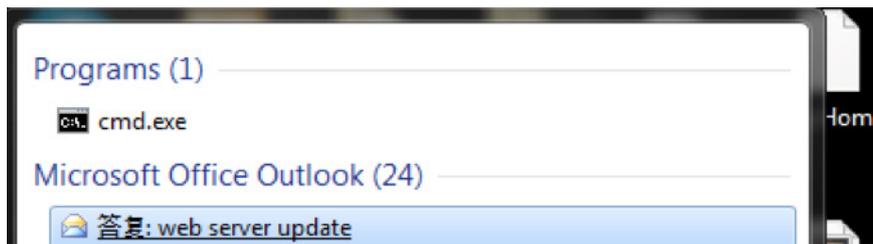
4.   Enter the following command line 'Telnet 192.168.0.225'

         The following window will be displayed to confirm being logged into the ACM500 successfully:
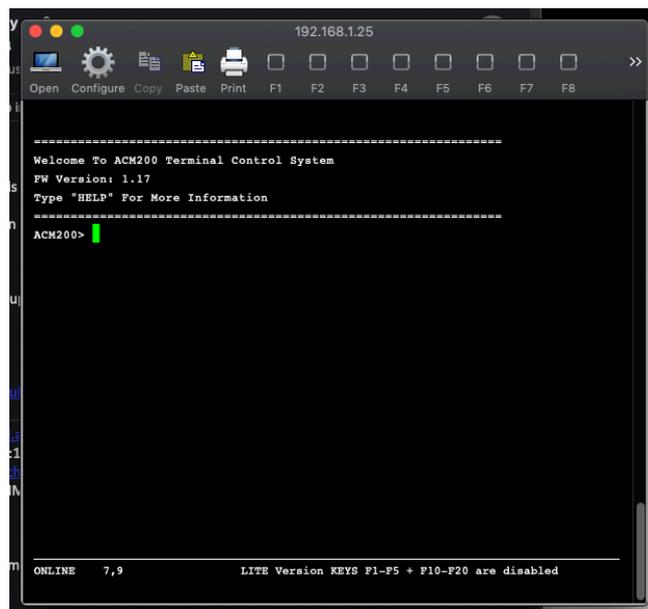
Telnet error

If the error message: '*telnet is not recognized as an internal or external command, operable program or batch file*', activate Telnet on your computer.

Unable to see the LAN ports of the ACM500

If unable to communicate (ping) the ports of the ACM500, connect directly to the network switch and not via a DHCP modem router to test.

**Able to ping the product but not login via Telnet connection**

If unable to communicate (ping) the ports of the ACM500, connect directly to the network switch and not via a DHCP modem router to test.

Adjusting Your Computer Settings - Enabling TFTP & Telnet

Prior to using the Blustream ACM500 Firmware update PC program you must activate both TFTP and Telnet features on your computer. This is achieved using the following steps below:

1. In Windows, navigate to Start -> Control Panel -> Programs and Features

2. In the Programs and Features screen, select Turn Windows features on or off in the navigation bar on the left.
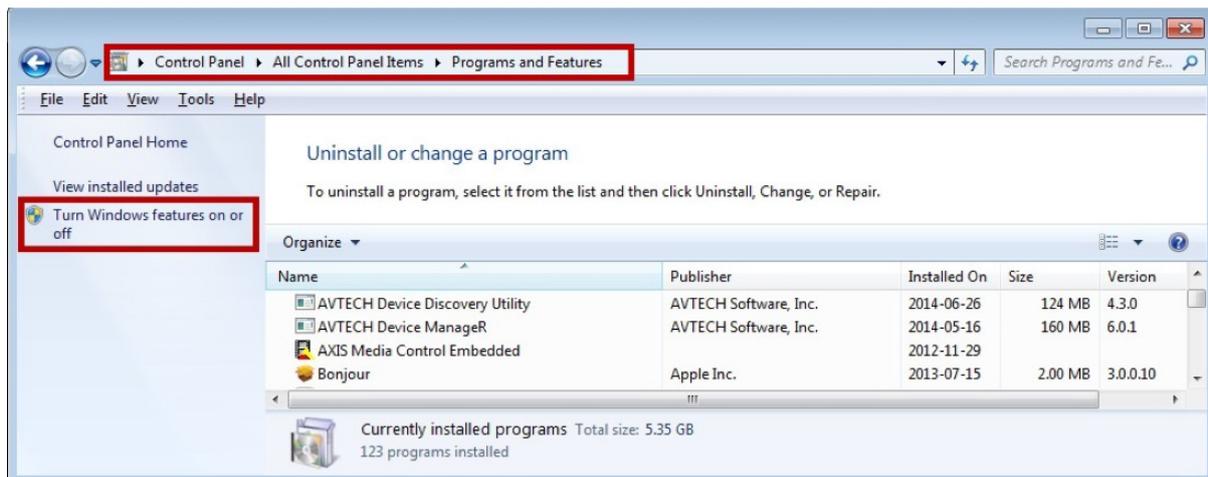
3. Once the Windows Features window populates, scroll down and make sure "TFTP client" and "Telnet Client" are both selected.
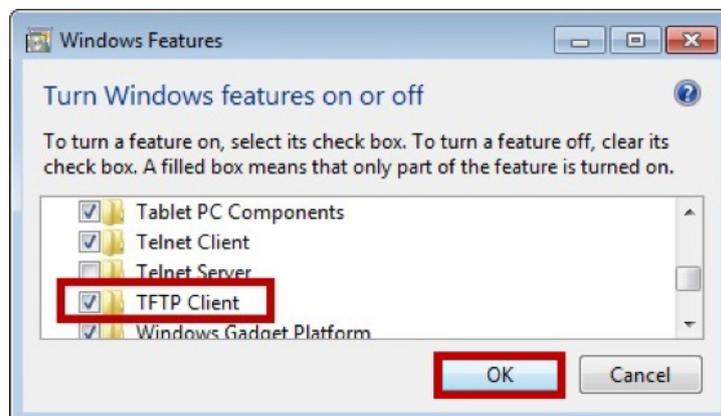
4. Once the progress bar fills and the pop up disappears, the TFTP client is enabled.
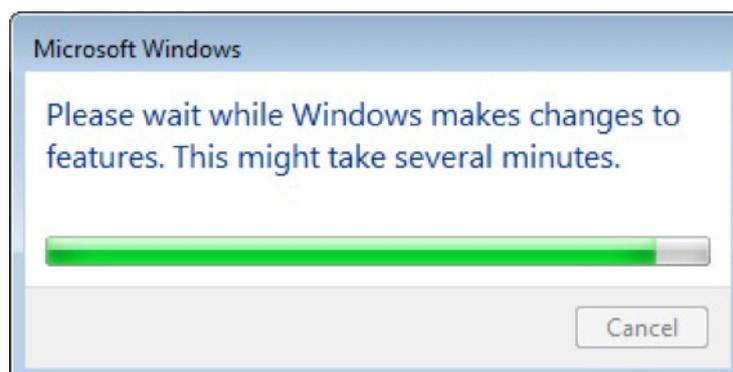
Setting a fixed IP address in Windows 7, 8 or 10

In order to communicate with the ACM500 your computer must first be in the same IP range as the ACM500 Control or Video LAN ports. By default the ports have the following IP address:

Control LAN port	192.168.0.225
Video LAN port	169.254.1.253

The following instructions allow you to manually alter the IP address of your computer allowing you to communicate with Blustream Multicast products.

1.   In Windows, type 'network and sharing' into the search box
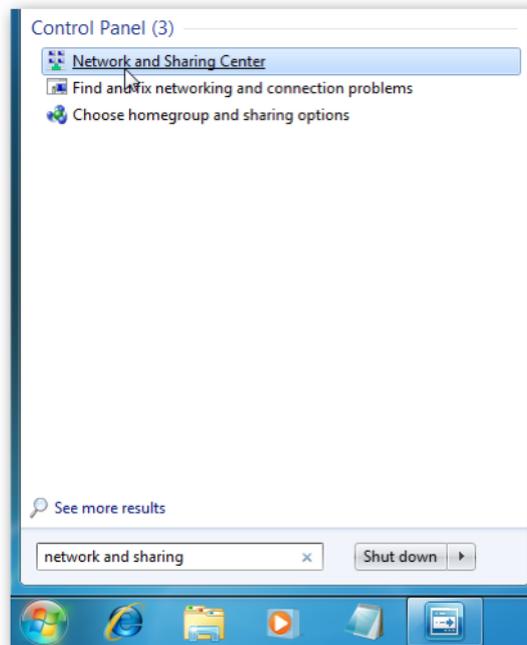
2.   When the Network and Sharing screen opens, click on 'Change adapter settings'.
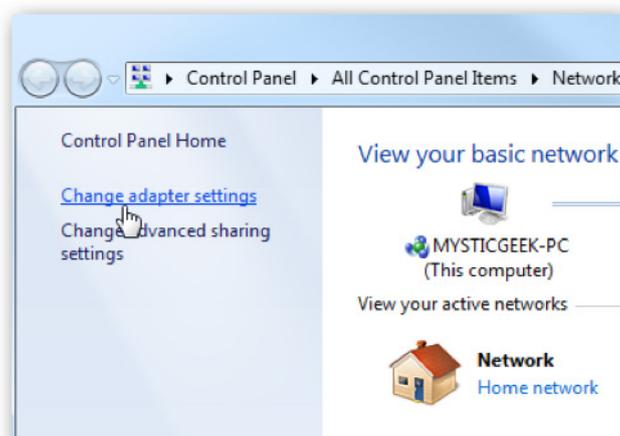
3.	Right click on your Ethernet adaptor and click Properties
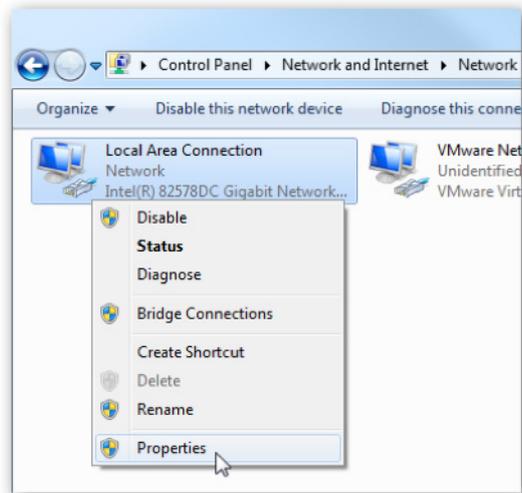
4.	In the Local Area Connection Properties window highlight Internet Protocol Version 4 (TCP/IPv4) then click the Properties button.
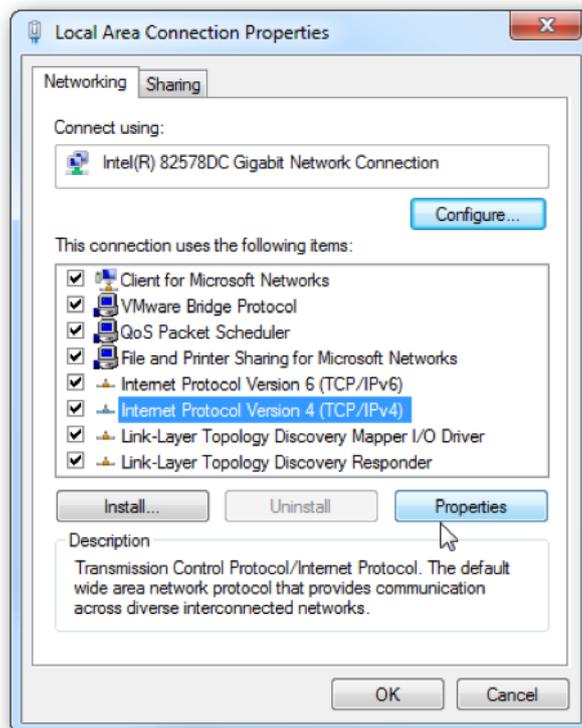
5.   Select the radio button Use the following IP address and enter in the correct IP, Subnet mask, and Default gateway that corresponds with your network setup.
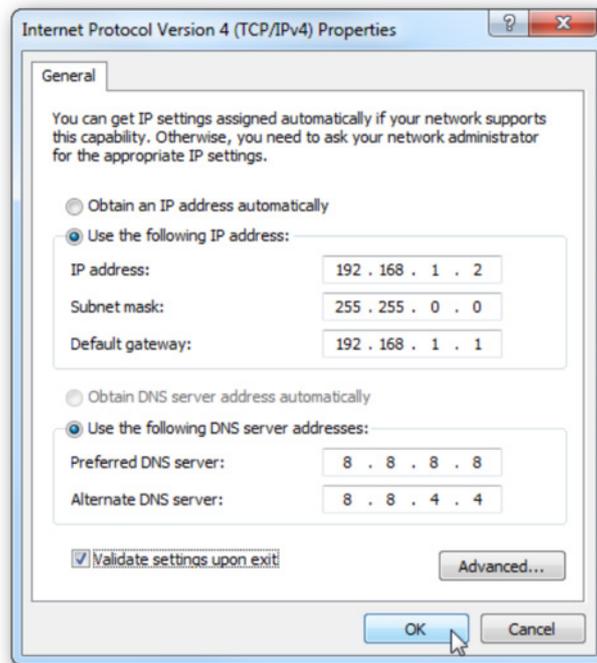
6.   Press OK and close out of all network screens. Your IP address has now been fixed.

Notes...

Notes...

www.blustream.com.au
www.blustream-us.com
www.blustream.co.uk