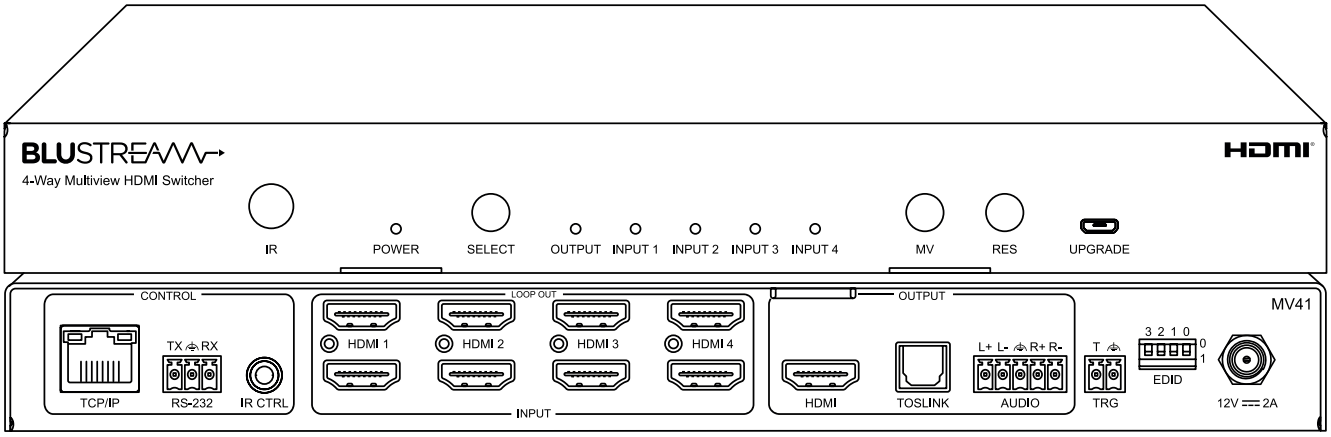


MV41

User Manual

Thank you for purchasing this 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 is highly recommended in order to protect and extend the life of your equipment.

Contents

Introduction 03

Features 03

Front Panel Description 04

Rear Panel Description 04

EDID Management 05

Multi-view 06

Front Panel Buttons 07

Web-GUI Control & Log in Page 08

Guest Control Page 09

Input Configuration Page 10

Output Configuration Page 11

Layout Configuration Page 12-13

Preset Configuration Page 14

Users 15

Settings & Firmware Updating 16

Ultrawide Resolutions 17-18

Package Contents 19

Maintenance 19

RS-232 Config & Telnet Commands 20-23

Schematic 24

Certifications 25

Introduction

Our MV41 is an advanced 4x1 HDMI multi-view switcher. The MV41 allows up to 4x HDMI 2.0 sources to be output to a single display at the same time, with pre-defined and customisable video layouts, and seamless switching. The MV41 also supports HDMI loop-through for all HDMI inputs allowing cascading of original source signals for further distribution.

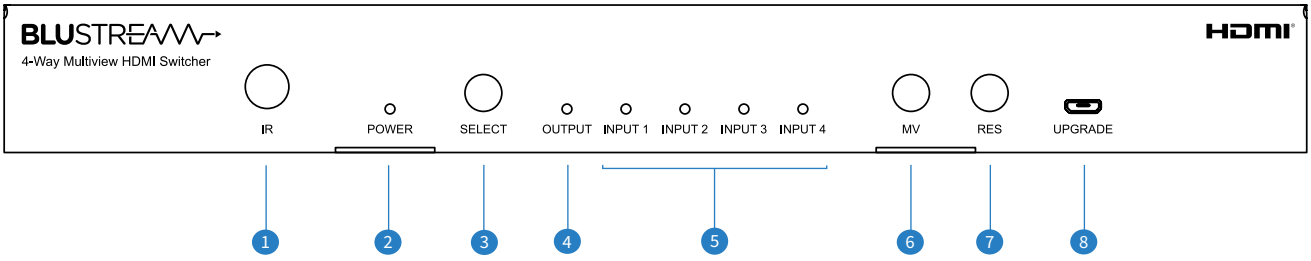
The MV41 features 2ch PCM and Optical S/PDIF audio break, with third party control achievable from the web-GUI, TCP/IP, RS-232, IR remote control, of from the front panel buttons.

The multiple configuration and connectivity options make the MV41 suitable for both residential and commercial installations

FEATURES:

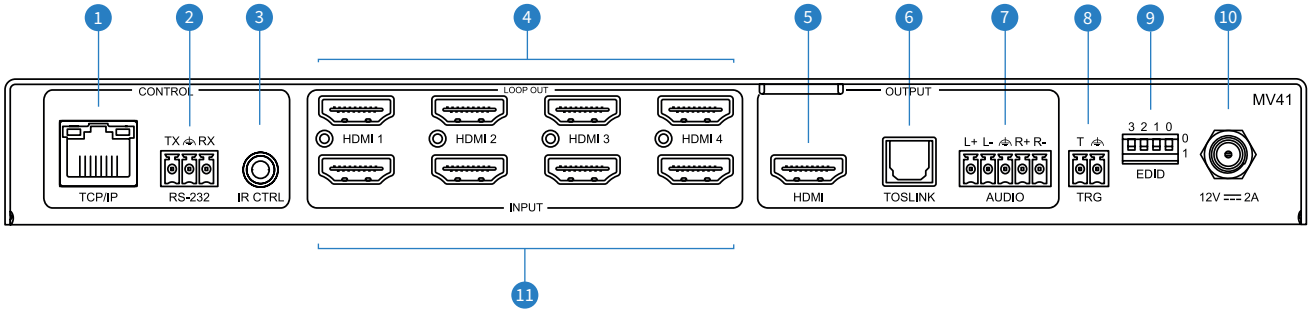
- Advanced 4 x HDMI input seamless switch with multi-view HDMI output
- Features 4 x HDMI loop out for integrating local displays or cascading to multiple devices
- Supports PIP, PBP, POP, Dual, Triple and Quad-window layouts with pre-defined and customisable configurations
- Supports video down-scaling and HDR to SDR conversion on HDMI multi-view output
- Supports HDMI 2.0 4K UHD 60Hz 4:4:4 18Gbps specification including HDR
- Supports all industry standard video resolutions including VGA-WUXGA and 480i-4K
- Supports bitstream passthrough of multichannel surround sound including object-based audio formats in line with HDMI specifications
- HDMI audio breakout to analogue L/R audio, and optical digital outputs concurrently
- Analogue L/R audio outputs support both balanced and unbalanced audio signals
- Control via front panel, IR, RS-232, TCP/IP, web-GUI and 12v trigger
- Supplied with Blustream 5v IR receiver and IR remote control
- 3rd party drivers available for major control brands
- HDCP 2.3 compliant with advanced EDID management

Front Panel Description



1. IR receiver window
2. Power LED status - illuminates blue when the Switcher is powered
3. Select button - press to toggle between HDMI inputs (1 > 2 > 3 > 4 > 1...). The input light will flash 3 times to confirm the switching function between enabled / disabled
4. Output LED indicator - indicates if a display device is connected to the Switchers HDMI output
5. Input LED indicators - displays the HDMI input currently active
6. MV button - sequentially scrolls through the multi-view layouts - see page 06 for more information
7. RES button - sequentially scrolls thorugh the output resolutions on the main HDMI output - see page 07 for more information
8. Firmware upgrade port - Micro USB allows for firmware update of device

Rear Panel Description



1. TCP/IP - RJ45 connector for TCP/IP and web-GUI control of the Switcher
2. RS-232 port - for control of the Switcher from a 3rd party control processor or PC (Phoenix block included)
3. External IR port - connect supplied Blustream 5v IR receiver, or control processor to control the Switcher
4. HDMI Loop Out ports - pass-through of the incoming HDMI signals from the source devices connected to the adjacent input ports
5. HDMI Output - connect to local display device, Matrix, or Video over IP transmitter
6. Optical S/DIF Output - de-embed digital audio as selected in the GUI, or from an API command
7. Analogue Audio Left/Right Output - 5-pin Phoenix connector to de-embed balanced or unbalanced audio from the selected HDMI input. Source audio input must be PCM 2 channel audio for the analogue output to work. **Please note:** the MV41 does not down-mix multi-channel audio signals
8. Trigger Port - 2-pin Phoenix connector - see page 16 for more information
9. EDID DIP switches - see page 05 for DIP switch and API control settings for EDID
10. Power port - use supplied Blustream 12v/2A DC adaptor to power the Switcher
11. HDMI inputs - connect to HDMI source devices

EDID Management

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

Configuration of the Switcher EDID settings can be acheived in one of three ways:

1. Using the Switchers web browser interface (see section on Web-GUI Control)
2. Using API commands via RS-232 or Telnet (see below)
3. Using the Switchers EDID DIP switches (see below)

To configure the EDID via RS-232 / API:

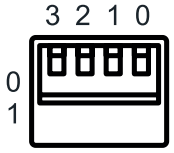
Configuration of the EDID settings for each input can be achieved using the following commands to specify the required EDID.

Please see the section on RS-232 and Telnet API at the end of this manual for full connectivity information:

EDID xx DF zz - set Input xx EDID to default EDID zz
- xx = Input On Product ('00' refers to ALL inputs; 02 = Input 2 etc)
- zz = 00 : HDMI 1080p@60Hz, Audio 2ch PCM (Default)
  - 01 : HDMI 1080p@60Hz, Audio 5.1ch DTS/DOLBY
  - 02 : HDMI 1080p@60Hz, Audio 7.1ch DTS/DOLBY/HD
  - 03 : HDMI 1080i@60Hz, Audio 2ch PCM
  - 04 : HDMI 1080i@60Hz, Audio 5.1ch DTS/DOLBY
  - 05 : HDMI 1080i@60Hz, Audio 7.1ch DTS/DOLBY/HD
  - 06 : HDMI 1080p@60Hz/3D, Audio 2ch PCM
  - 07 : HDMI 1080p@60Hz/3D, Audio 5.1ch DTS/DOLBY
  - 08 : HDMI 1080p@60Hz/3D, Audio 7.1ch DTS/DOLBY/HD
  - 09 : HDMI 4K@30Hz 4:4:4, Audio 2ch PCM
  - 10 : HDMI 4K@30Hz 4:4:4, Audio 5.1ch DTS/DOLBY
  - 11 : HDMI 4K@30Hz 4:4:4, Audio 7.1ch DTS/DOLBY/HD
  - 12 : HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 2ch PCM
  - 13 : HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 5.1ch DTS/DOLBY
  - 14 : HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 7.1ch DTS/DOLBY/HD
  - 15 : HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2ch PCM
  - 16 : HDMI 4K@60Hz 4:4:4, 8-bit, Audio 5.1ch DTS/DOLBY
  - 17 : HDMI 4K@60Hz 4:4:4, 8-bit, Audio 7.1ch DTS/DOLBY/HD
  - 18 : HDMI 4K@60Hz 4:4:4, 10-bit, Audio 2ch PCM
  - 19 : HDMI 4K@60Hz 4:4:4, 10-bit, Audio 5.1ch DTS/DOLBY
  - 20 : HDMI 4K@60Hz 4:4:4, 10-bit, Audio 7.1ch DTS/DOLBY/HD
  - 21 : HDMI 4K@60Hz 4:4:4, 12-bit, Audio 2ch PCM
  - 22 : HDMI 4K@60Hz 4:4:4, 12-bit, Audio 5.1ch DTS/DOLBY
  - 23 : HDMI 4K@60Hz 4:4:4, 12-bit (inc DV), Audio 7.1ch DTS/DOLBY
  - 24 : HDMI 4K@60Hz 4:4:4, 10-bit (inc DV), Audio 2ch PCM
  - 25 : HDMI 4K@60Hz 4:4:4, 10-bit (inc DV), Audio 5.1ch DTS/DOLBY
  - 26 : HDMI 4K@60Hz 4:4:4, 10-bit (inc DV), Audio 7.1ch DTS/DOLBY
  - 27 : HDMI 4K@60Hz 4:4:4, 12-bit (inc DV), Audio 2ch PCM
  - 28 : HDMI 4K@60Hz 4:4:4, 12-bit (inc DV), Audio 5.1ch DTS/DOLBY
  - 29 : HDMI 4K@60Hz 4:4:4, 12-bit (inc DV), Audio 7.1ch DTS/DOLBY
  - 30 : DVI 1280x1024@60Hz, Audio None
  - 31 : DVI 1920x1080@60Hz, Audio None
  - 32 : DVI 1920x1200@60Hz, Audio None
  - 33 : HDMI 1920x1200@60Hz, Audio 2ch PCM/6ch PCM
  - 34 : User EDID 1
  - 35 : User EDID 2
  - 36 : EDID Pass-through (Copy from Output)

To configure the EDID via DIP Switch:

To configure the global EDID for all inputs via the DIP switch, use the settings below. **Please note:** this will override and disallow any EDID settings configured via the web-GUI.



3	2	1	0	EDID Type
Combination of DIP positions				
0	0	0	0	1080p 60Hz 2.0ch
0	0	0	1	1080p 60Hz 5.1ch
0	0	1	0	1080p 60Hz 7.1ch
0	0	1	1	1080i 60Hz 2.0ch
0	1	0	0	1080i 60Hz 5.1ch
0	1	0	1	1080i 60Hz 7.1ch
0	1	1	0	4K 60Hz 4:2:0 2.0ch
0	1	1	1	4K 60Hz 4:2:0 5.1ch
1	0	0	0	4K 60Hz 4:2:0 7.1ch
1	0	0	1	4K 60Hz 4:4:4 2.0ch
1	0	1	0	4K 60Hz 4:4:4 5.1ch
1	0	1	1	4K 60Hz 4:4:4 7.1ch
1	1	0	0	DVI 1280x1024@60Hz
1	1	0	1	DVI 1920x1200@60Hz
1	1	1	0	DVI 1920x1080@60Hz
1	1	1	1	Software EDID

Please note: when using the web-GUI of the MV41 to configure individual EDID settings per input device, the DIP-switches on the rear of the unit must be set to 'Software EDID'.

Multi-view

The MV41 provides advanced multi-view functionality to allow 4 x sources to be displayed simultaneously on a HDMI display. The MV41's web-GUI provides an easy-to-use interface, to allow Users full control of the multi-view functionality. The unit provides the following key functionality:

- Drag and drop source devices (inputs) onto specific output windows
- Pre-defined multi-view layouts and user configurable custom layouts
- Selectable audio source from HDMI inputs
- Auto-switching enable / disable

The pre-defined multi-view layouts are as below:



Front Panel Buttons

The MV41 provides limited control capabilities form the front panel.

Select button - press to toggle between HDMI inputs (1 > 2 > 3 > 4 > 1...). Auto-switching function is enabled / disabled by pressing and holding the Select button for 5 seconds. Input light will flash 3 times to confirm switching function enabled / disabled

Multi-View (MV) Button - Press to toggle between multi-view modes - see previous page for the multi-view layout presets. Pressing the MV button will toggle between the layouts in order (1 > 2 > 3 > 4 >5 and so on).

Resolution (RES) Button - Press to toggle between output resolutions. The output resolution is only for the main HDMI output of the MV41, and not for the Loop Out ports on the unit. The scaled outputs of the Loop Out ports can be adjusted within the web-GUI, or from an API command.

For the main output, the following resolutions can be achieved, pressing the RES button moves to the next resolution in the list, and back to Auto when toggling from 1024x768p (note that ultrawide resolutions are not selected when pressing the RES button and must be selected manually through the GUI or API):

- Auto
- 3840x2160p 60Hz
- 3840x2160p 50Hz
- 4096x2160p 60Hz
- 4096x2160p 50Hz
- 3840x2160p 30Hz
- 1920x1080p 60Hz
- 1920x1080p 50Hz
- 1920x1080i 60Hz
- 1920x1080i 50Hz
- 1280x720p 60Hz
- 1280x720p 50Hz
- 1380x768p 60Hz
- 1280x800p 60Hz
- 1920x1200p 60Hz
- 1024x768p 60Hz

Please note: the front panel buttons can be disbaled from the web-GUI / API

Factory Reset

To factory reset the MV41 from the front panel, press and hold both the MV and RES buttons simultaneously for 5 seconds, all input/output LEDs will flash, the unit will then reboot and restore the factory default settings.

Web-GUI Control

This following pages will take you through the operation of the units web-GUI. You must connect the TCP/IP RJ45 socket to your local network, or directly from your computer to the MV41, in order to access the products web-GUI.

By default the Switcher is set to DHCP, however if a DHCP server (eg: network router) is not installed the Switchers IP address will revert to below details:

Default IP Address is: 192.168.0.200 Default Username is: blustream Default Password is: @Bls1234

Domain Name is: mv41.local

The web-GUI supports multiple users along with multiple user permissions as follows:

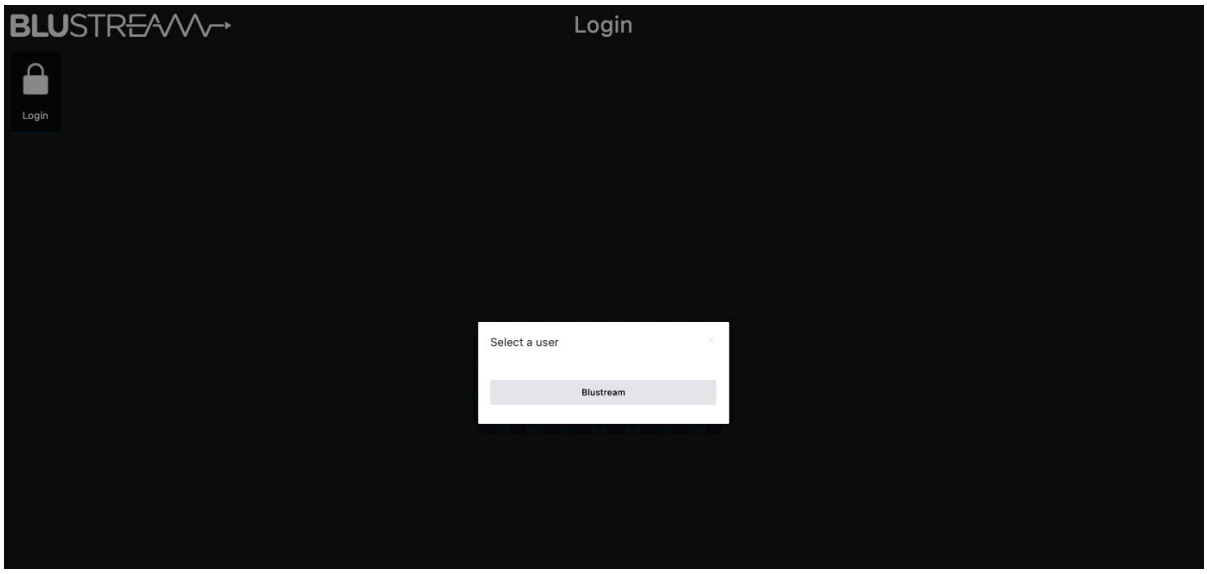
Guest Account - this account does not require a user to login. The Guest account can only change input and layouts. Guest access can be changed by the Admin, limiting inputs or layouts as necessary.

User Accounts - User accounts can be utilised, each with individual login details. User accounts can be assigned permissions to specific areas and functions. A User must log in to make use of these functions.

Admin Account - this account allows full access to all functions of the Switcher, as well as assigning users with permissions.

Login Page

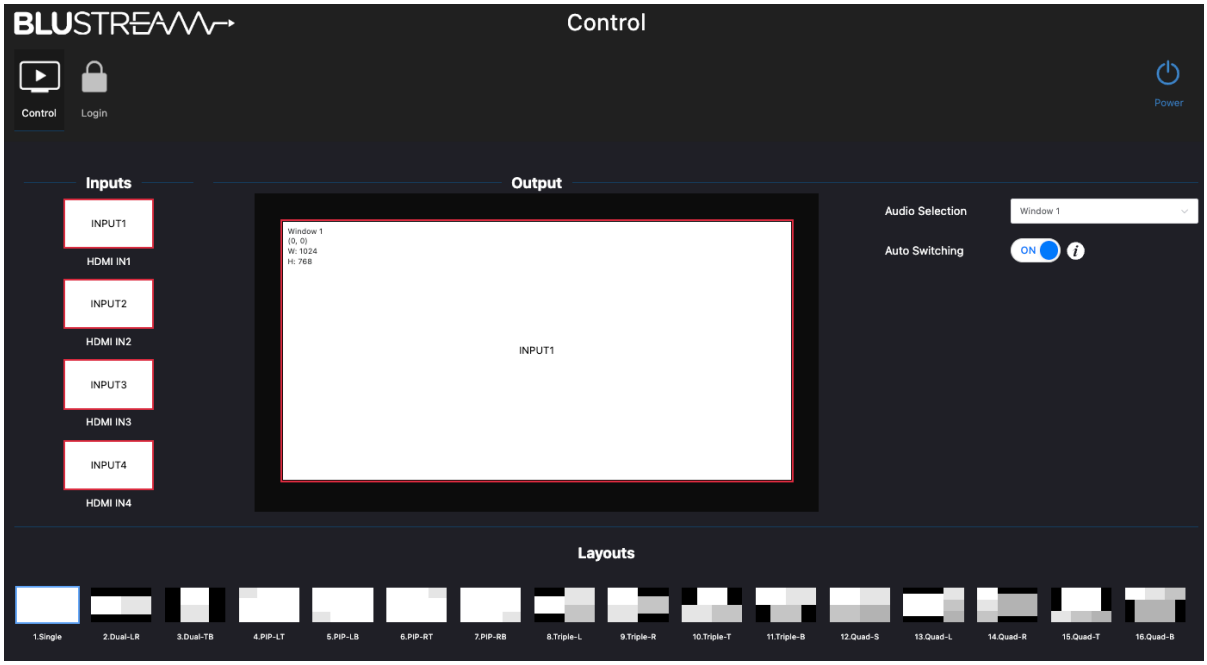
The Login Page allows a User or Admin to login and access additional functionality.



Please note: the first time the Administrator logs into the web-GUI of the MV41, the default password (1234) must be changed to a unique password. Please retain this password for future use. Forgetting the password will mean having to factory reset the unit, losing all configuration of the unit.

Guest Control Page

If the Guest User has been enabled (disabled by default), following the Admin, or a unique User having logging out of the GUI, or navigating to the IP address or Domain Name of the MV41, the Guest Control page will be displayed.



Multi-view layouts, and pre-defined Presets can be selected by clicking on one of the Layouts at the bottom of the browser window.

Switching is carried out by dragging and dropping the Input (on the left) onto the window in the centre of the screen, or to the individual multi-view Windows as represented in the centre of the screen.

Audio can be switched by using the drop-down selection box in the top right of the screen. This will default to being the main window (window 1), but can be amended to any of the following options as required:

- Mute
- Input 1
- Input 2
- Input 3
- Input 4
- Window 1
- Window 2
- Window 3
- Window 4

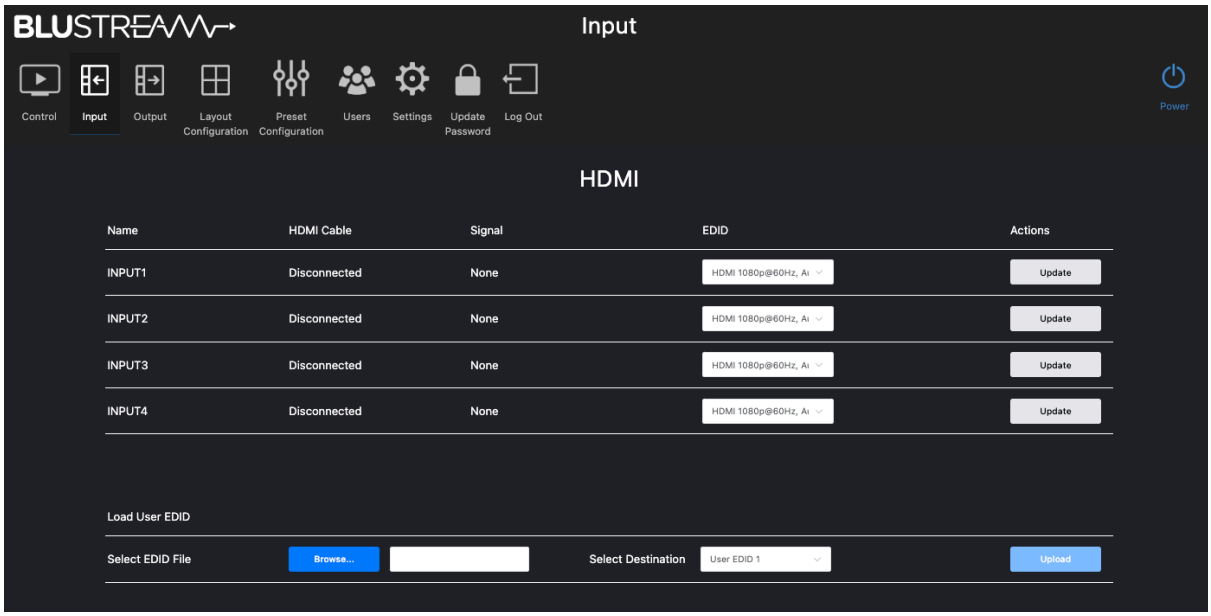
Auto Switching, and Power toggle commands can also be controlled from the Guest account window.

Please note: permissions can be set for individual Users and also the Guest account by the system Administrator. Individual permissions can be granted for:

- Power control
- Audio selection
- Audio switching
- Inputs
- Outputs
- Presets
- Layouts

Input Configuration Page

The Input configuration page allows the Admin to name and select the required EDID for each input source device to the MV41. Clicking the 'Update' button to the right of each input allows for the name of the source to be entered. This name is updated in the Control page for simpler selection of inputs by a User.



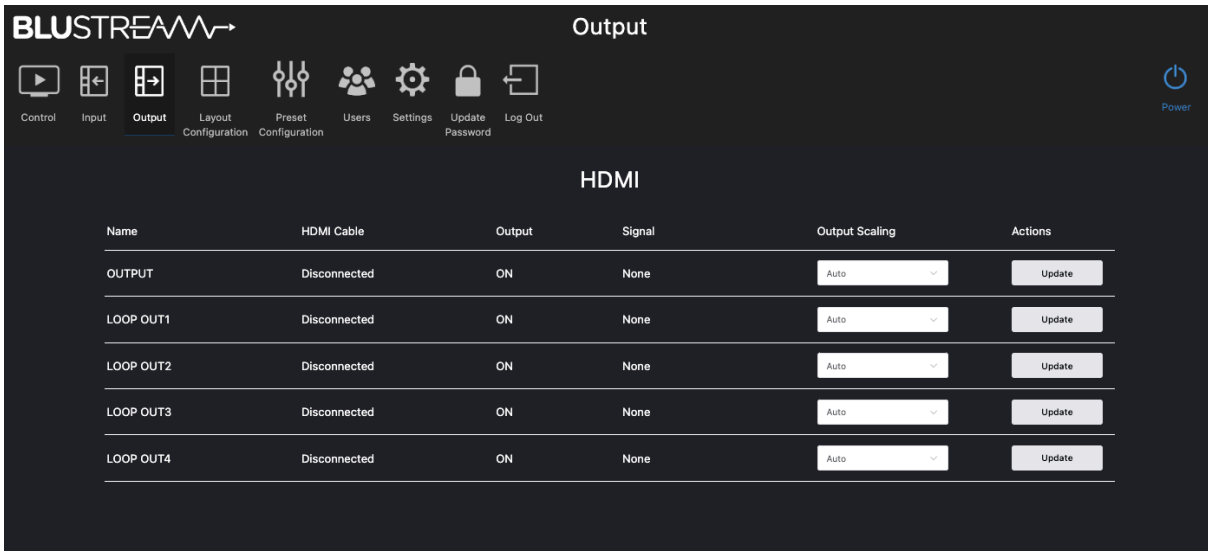
EDID selection can be made for each individual source device to ensure the correct video and audio resolutions are requested from the MV41 to the source. The drop-down box contains all of the EDID formats as outlined in page 05 of this manual, and also includes the ability to copy the EDID from the displays connected to the HDMI Loop out ports.

It is also possible to upload custom EDID .bin files to the MV41 if a specific EDID is not listed within the standard formats. A custom EDID file can be generated from a third party EDID generation tool, and uploaded using the 'Load User EDID' section at the bottom of the page. There are 2 x custom EDID slots available that can be directed at any of the 4 x inputs.

Output Configuration Page

The Output configuration page allows you to name and select the scaled output resolution of each of the 5 x HDMI output ports on the MV41. Clicking the 'Update' button to the right of each output allows for the name of the connection to be entered. Inside the 'Update' pop-up window, the Admin has the ability to amend the following information for the main HDMI output:

- Output (ON or OFF) - turns output on of off as required
- Seamless Switching (ON or OFF) - when seamless switching is disabled (default), switching between Single mode and Multi-view mode with dynamic metadata such as HDR will result in a quick picture drop, this is due to the MV41 changing between an SDR and dynamic scaling process
- Advanced Picture Settings including: Brightness, Saturation, Hue, Contrast, HDRCB and HDRCR - adjusting these setting values will affect the image in both Single mode and Multi-view mode, but not on the HDMI Loop out ports



The Update buttons for the HDMI Loop out ports are only for naming the connection, and turning the output ON/OFF as required. Colour / image settings cannot be adjusted for the Loop out ports.

The Output Scaler settings drop-down box contains all of the scaled outputs as outlined in page 07 of this manual for the Main output. The HDMI Loop out ports have the ability to be set to:

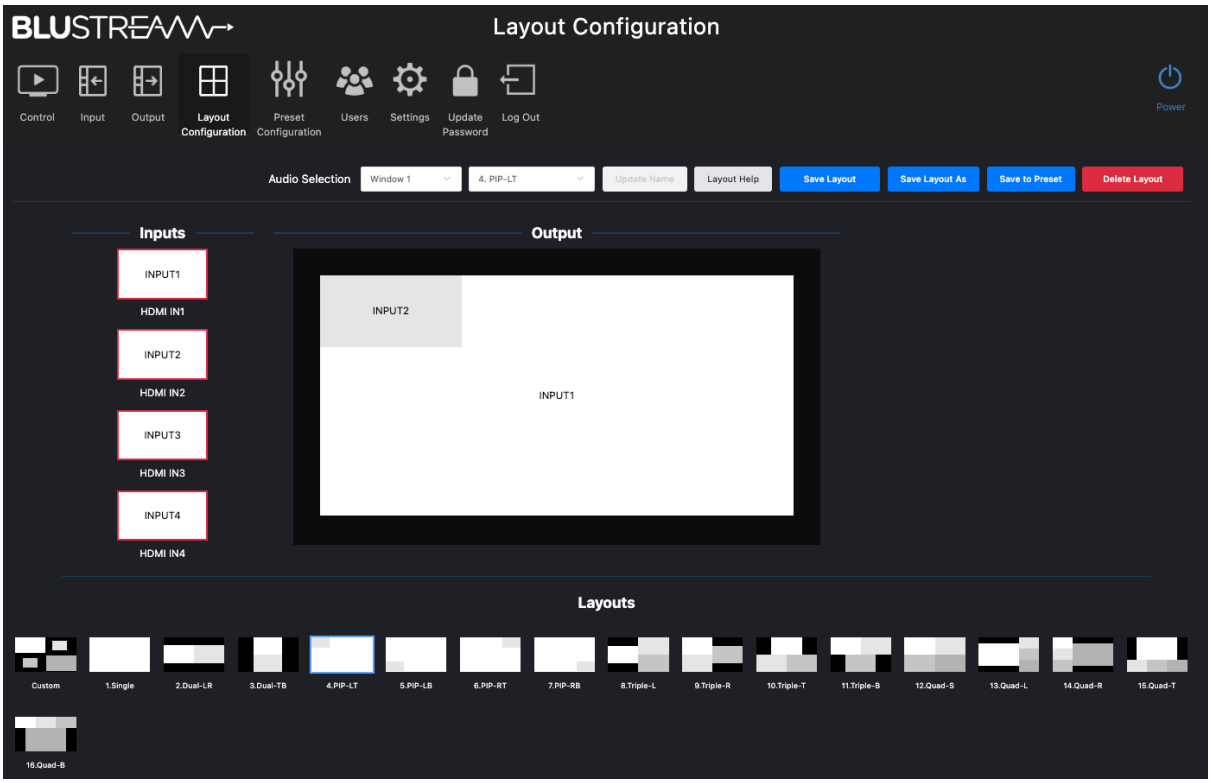
- Bypass - retains the incoming video resolution and passes this straight through to the output
- Force 1080p - outputs the signal at a 1080p resolution, with the same refresh rate as the source / input
- Auto - if the sink / display connected ot the output is 1080p, this will revert to 1080p as the MV41 will read the EDID response from the display. If the output is a mixed output (may change depending on use), the MV41 can adjust the output resolution to suit the display connected

Layout Configuration Page

The Layout configuration page allows for the Admin to pre-define which input sources are displayed in each window of the differing multi-view layouts, and save these as customised layouts. The switching of inputs to each window is the same as in the main Control page of the web-GUI, with the 16 x default multi-view layouts all displayed at the bottom of the screen.

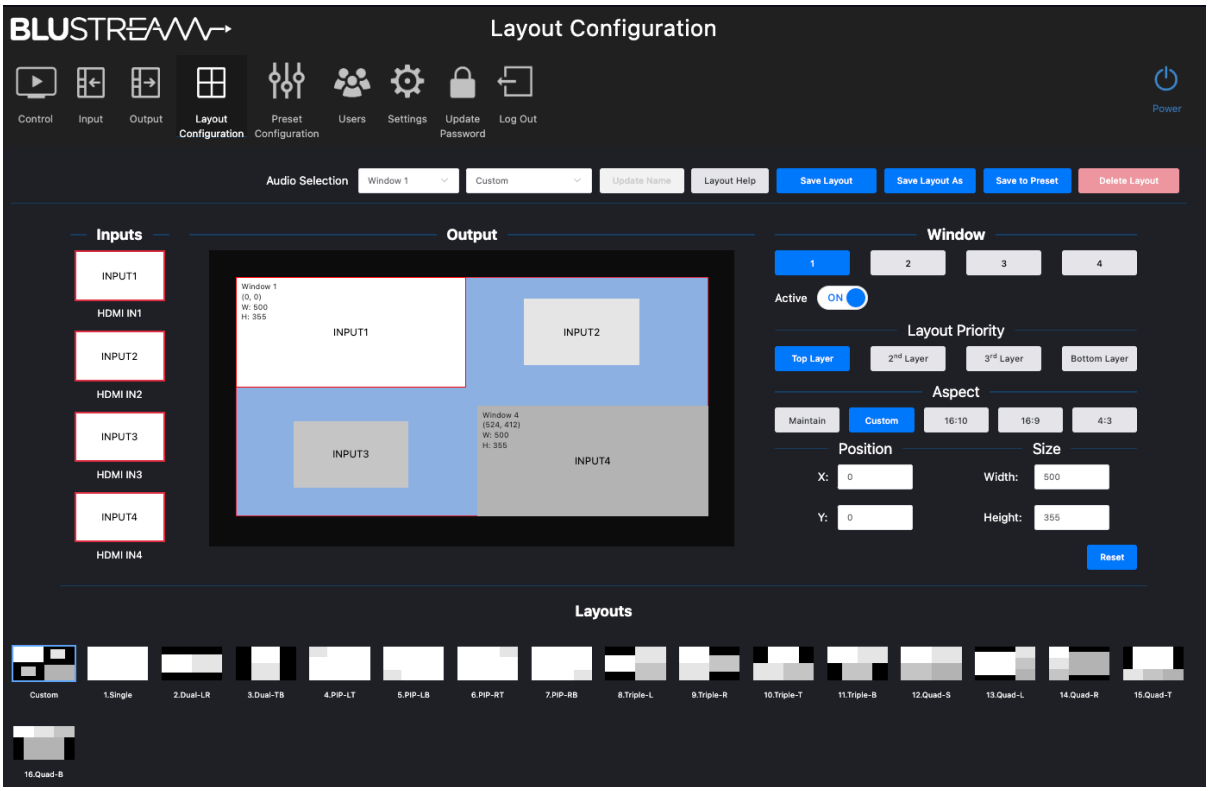
This page also allows for a customised layout to be created where numer of windows, sizes, positions, and layers can be configured. This customisable multi-view layout option appears along the bottom list of views, before the Single layout at the start of the list, labelled 'Custom'.

Any customisation of a layout on this page can be saved as a layout, or as a preset where inputs will always appear within the saved window when recalled.



Layout Configuration Page continued...

Clicking on the 'Custom' layout at the bottom of the page, opens up the advanced features for the Admin to fully customise the layout of the output.



The right hand side of the screen allows for each window to be individually configured:

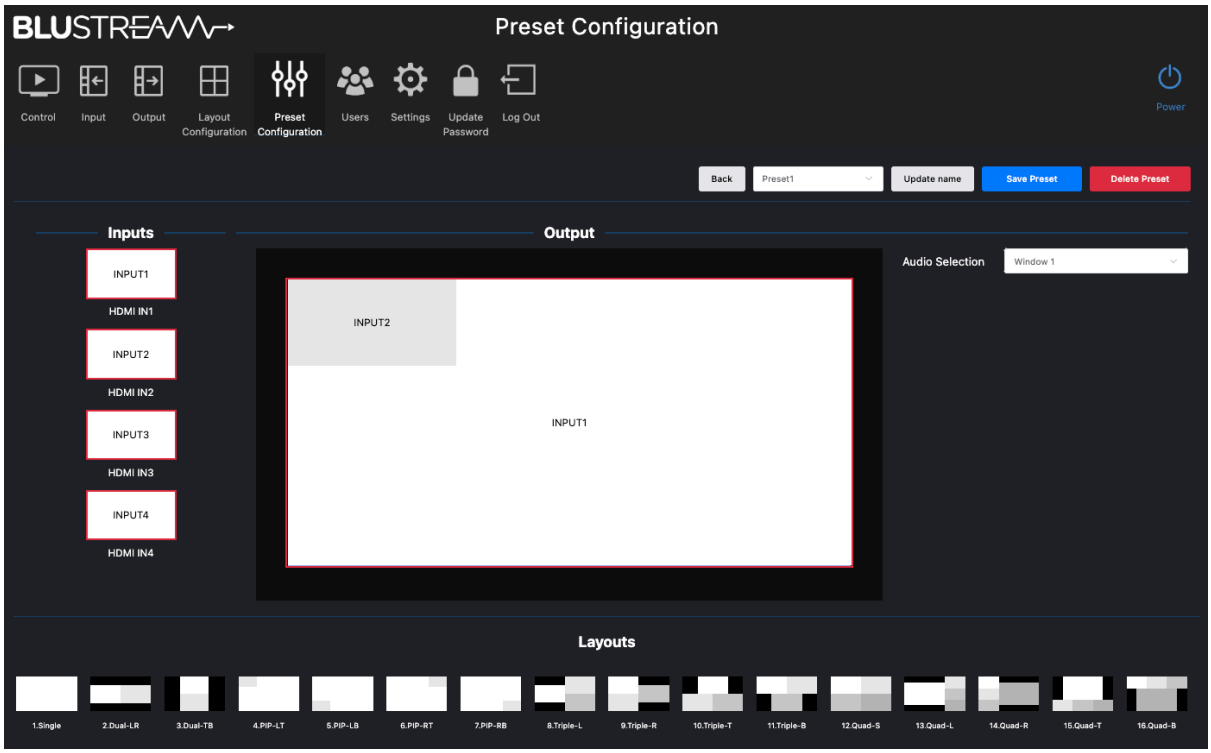
- Window - select between up to 4 windows by clicking the relevant buttons. Windows can be disabled by toggling the Active ON/OFF switch to add / remove them from the customised layout screen. All settings underneath are specifically for the Window currently selected (coloured blue)
- Layout Priority - moves the selected Window layer up and down based on other Windows positions. Moving a window to the top layer will move all other windows back a layer automatically
- Aspect - amend the aspect ratio of the window inside the screen. Options are:
    - Maintain - maintains the incoming aspect ratio of the media from the source device
    - Custom - allows the aspect ratio to be manipulated as required - the image will stretch / compress as per the size of the window adjusting the look of all elements inside the window
    - 16:10 / 16:9 / 4:3 - fixes the aspect to one of the 3 most common aspect ratios used in most media devices
- Position - move the position (top left hand corner) of the window to a specific co-ordinate on the output screen. Windows can be moved by clicking and moving the mouse inside the graphical representation of the window to a different position, or by specifying an exact pixel co-ordinate for the window to be positioned
- Size - change the size of the window by entering the number of pixels high, by pixels wide

Please note: changing the output resolution of the main HDMI output affects: the aspect ratios and position / size of the windows in this page, as well as the size of the canvas in the web-GUI. We would recommend configuring the output scaler settings before setting up customised layouts.

Once a specific layout has been configured use the 'Save Layout', 'Save Layout As', or 'Save to Preset' to save the config to a pre-defined layout that can be recalled as required.

Preset Configuration Page

Presets can be defined for simple recall of specific layouts, inputs in each window, or from a 3rd party control platform. There are no presets defined by default, but can be added from this page. Click the 'New Preset' button in the top right of the page to configure a new preset. Creating a new preset requires an ID to be assigned (default first ID will be number 1, and will increase sequentially as more are added). The preset can be named accordingly at this time. Once the preset has been created, you can choose from any of the 16 x pre-defined layouts at the bottom of the screen, the preset will default to a single screen output:



Drag and drop the inputs you wish to appear onto each Window when the preset is recalled. The naming convention of the inputs will be displayed for simpler configuration at this stage. Select which audio is to be embedded onto the outgoing HDMI signal, or the audio breakout connections usig the drop down Audio Selection box.

Click 'Save Preset'

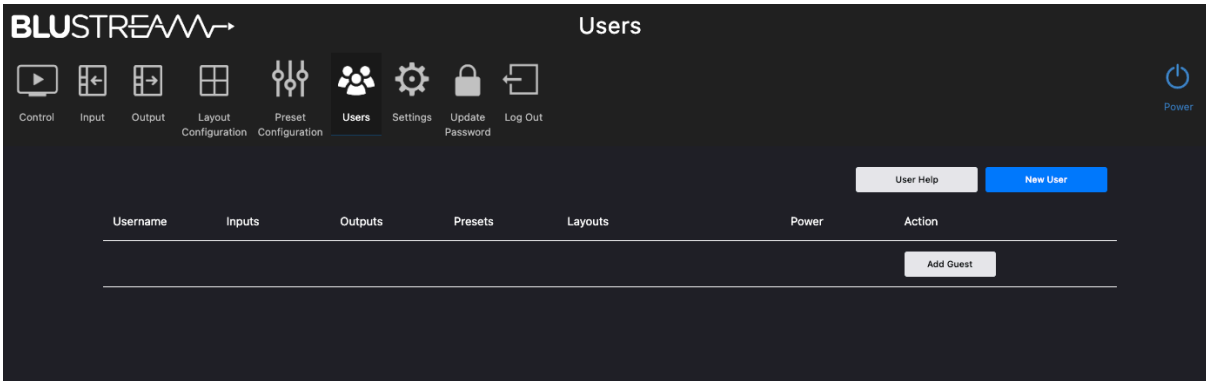
Once the Preset has been saved, this will appear at the bottom of the Control page with the rest of the pre-defined multi-view layouts. When recalling this preset, the multi-view layout, and the inputs to the specified windows will be recalled from one single command. It is possible to save up to 8 x Presets to the MV41 for differing scenarios.

To amend a Preset, click on the Update button for the Preset you wish to amend in the Preset Configuration page.

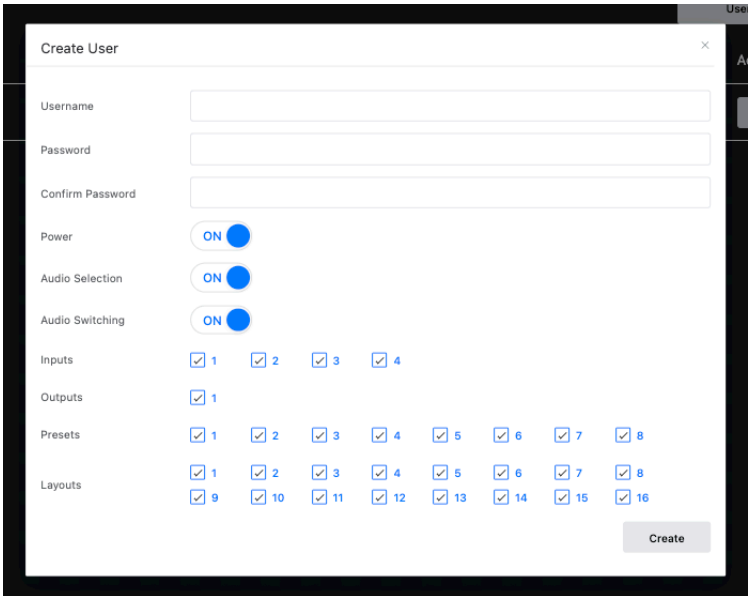
Users

To simplify control from the web-GUI of the MV41, it is possible to create multiple Users that have different permissions based on what the User requires access to. All Users will have a Username and Password that need to be entered to gain control of the MV41.

A Guest User can also be created that does not require a user or password credentials for control of the unit. Again, the Admin can grant access to certain permissions for the Guest User as required.



To create a new User, click the button marked New User. Enter the Username, individual Password (confirming to proceed in the field underneath), and select the Users permissions as required:

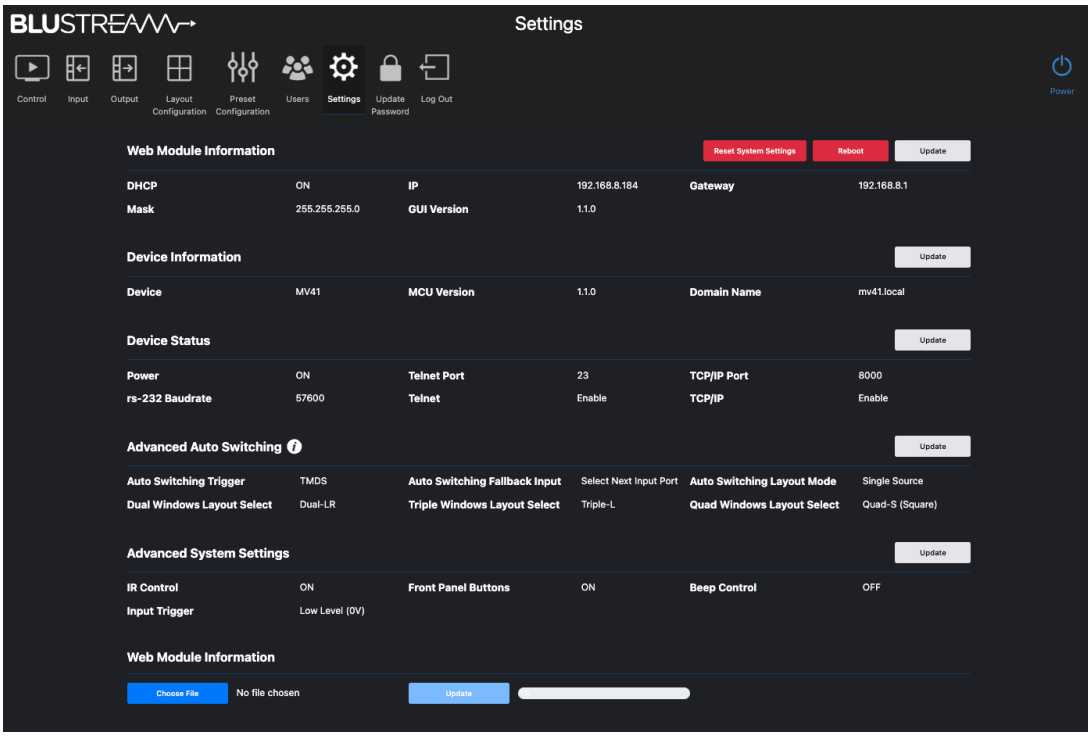


Click ‘Create’ to save and confirm the new Users credentials.

A Guest User can be added by clicking the button marked ‘Add Guest’. It is not required to enter a Username or Password for a Guest User.

Settings Page

The Settings Page allows for the Admin to configure various functionality of how the MV41 is going to be used.



- Reset System Settings: click this button to reset the MV41 back to factory default
- Reboot: reboots the unit. Does not reset or change any settings of the unit
- Web Module Information: click the 'Update' button on the right of the Reboot button to amend: DHCP ON (default)/ OFF, IP Address, Gateway, Subnet Mask settings
- Device Information: click the 'Update' button to amend the Domain name of the MV41
- Device Status: click the 'Update' button to amend: serial baud rate, Telnet port (default: 23), TCP/IP port (default: 8000), or to disable Telnet or TCP/IP ports from being used
- Advanced Auto Switching: click the 'Update' button to amend how the Auto Switching function for the MV41 works for the end user. Configuration inside this menu includes:
    - Auto Switching Trigger: choose between TMDS (default) or 5v
    - Auto Switching Fallback Input: allows for input prioritisation to be set
    - Auto Switching Layout Mode: select between single screen, or multi-view layout
    - Dual Window Layout Select: select what type of dual layout is to be displayed when an auto-switch is triggered
    - Triple Window Layout Select: select what type of triple layout is to be displayed when an auto-switch is triggered
    - Quad Window Layout Select: select what type of quad layout is to be displayed when an auto-switch is triggered
- Advanced System Settings: click the 'Update' button to amend the following functions: IR Control (ON/OFF), Front Panel Buttons (ON/OFF), Beep Control (ON/OFF), Input Trigger (Off, Low Level (0v), High Level (5-12v), Rising Edge, Falling Edge), Trigger Event (Presets, or Window Pop-ups), Trigger Window Source (Inputs 1-4), Trigger Disappear After (Level / Edge Changed, Timeout), Trigger Timeout (time in seconds).
- Web Module Information: used for all firmware updating of the device via TCP/IP connection. There are 2 x firmware packages that can be uploaded from this field: Main Control Unit (MCU) and Web-GUI. We would recommend updating the MCU first (if required), followed by the GUI. Use the 'Choose File' button to select the firmware file (needs to be downloaded to your laptop in advance - available to download from the Blustream website). We would always recommend carrying out firmware updates locally with a hard-wired network connection.

Ultrawide Resolutions

The MV41 now supports a range of ultrawide 21:9 and 32:9 resolutions, allowing integration with ultrawide displays and sources.

For ultrawide resolution support, firmware must be updated to a minimum of:

MCU: 1.4.0

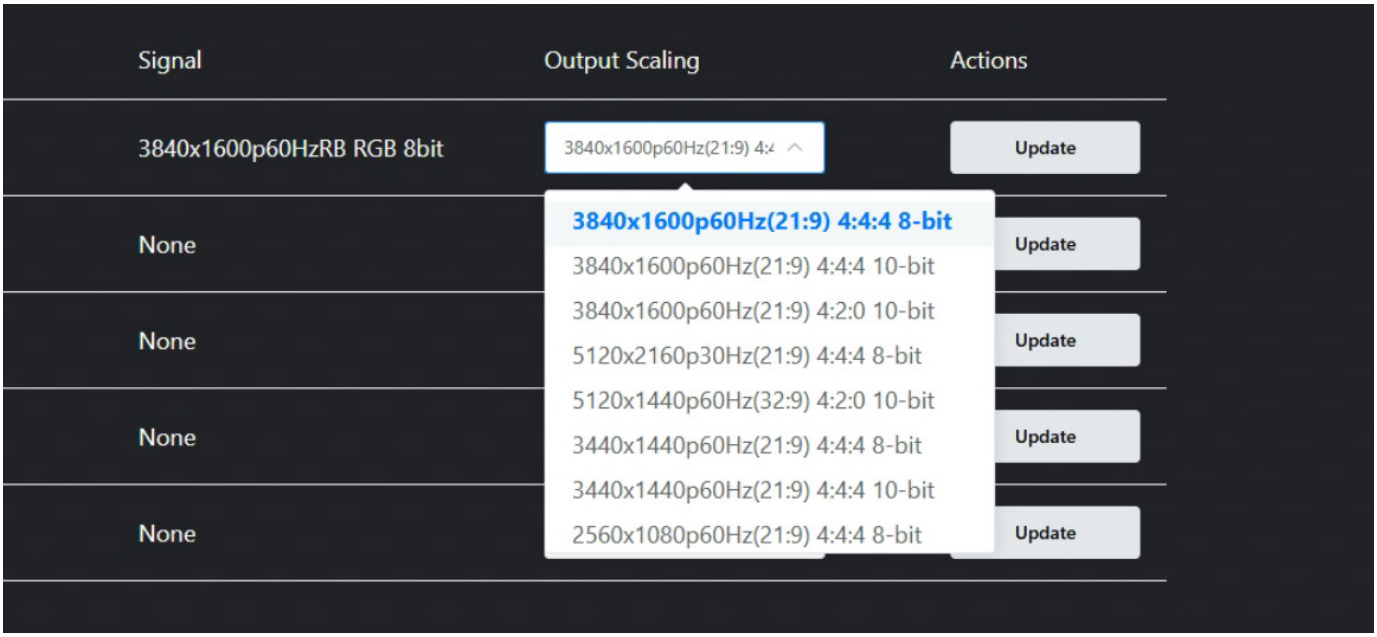
GUI 1.5.0

Supported ultrawide resolutions are:

- 3840x1600 21:9 60Hz RGB 4:4:4 8-bit
- 3840x1600 21:9 60Hz RGB 4:4:4 10-bit
- 3840x1600 21:9 60Hz 4:2:0 10-bit
- 5120x2160 (5K2K) 21:9 30Hz RGB 4:4:4 8-bit
- 5120x1440 32:9 60Hz 4:2:0 10-bit
- 3440x1440 21:9 60Hz RGB 4:4:4 8-bit
- 3440x1440 21:9 60Hz RGB 4:4:4 10-bit
- 2560x1080 21:9 60Hz RGB 4:4:4 8-bit
- 2560x1080 21:9 60Hz RGB 4:4:4 10-bit
- 5120x2880 (5K) 21:9 30Hz 4:2:0 8-bit
- 5120x1440 32:9 60Hz 4:4:4 8-bit

Ultrawide Output Resolution

Ultrawide output resolutions can be selected from the GUI or the API. To select in the GUI navigate to the Output tab and select the desired resolution in the Output Scaling drop down:

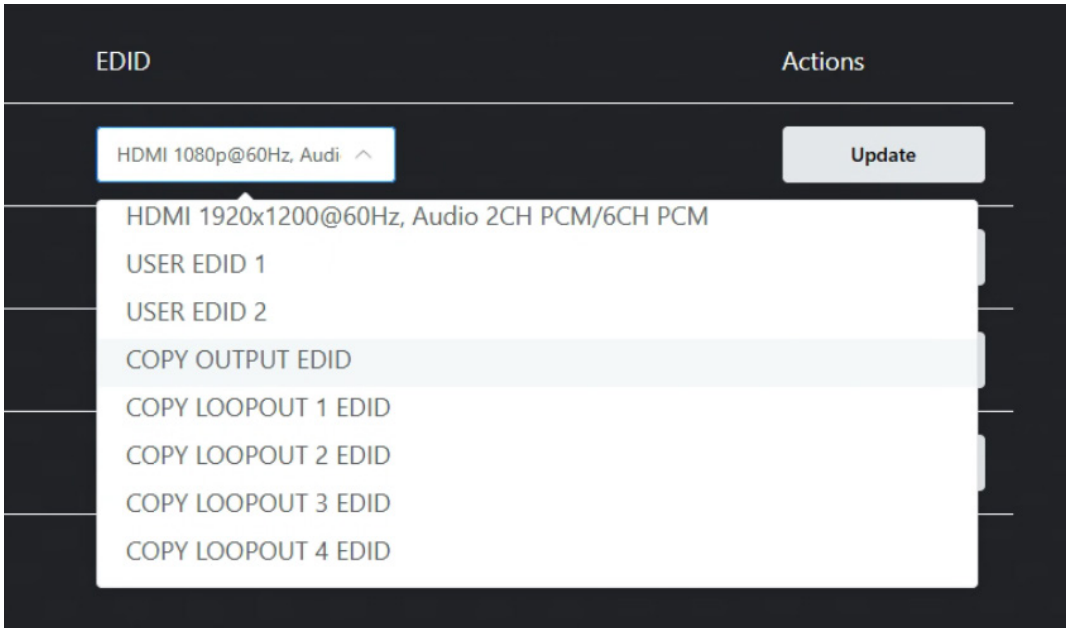


Ultrawide resolutions can also be selected using the API command OUT SCALING yy, detailed at the back of this manual on page 22.

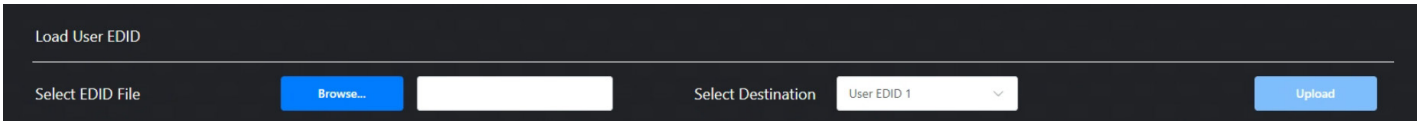
Ultrawide Input EDID

A suitable ultrawide EDID will need to be configured for the inputs to allow source devices to output the desired ultrawide resolution.

This can be achieved by copying the EDID from the connected ultrawide display, or by uploading a custom EDID. To copy the EDID from the connected display, navigate to the Inputs tab and in the EDID drop down select COPY OUTPUT EDID.



To upload a custom EDID, use the Load User EDID option on the Inputs tab to upload the desired EDID file to User EDID 1 or User EDID 2 slot, then select this EDID for each input.



Please note:

- No default ultrawide EDIDs are included, these must be configured as detailed above, either copying the output EDID or uploading a custom user EDID.
- The “Auto” output scaling setting will not automatically switch to an ultrawide resolution, the desired ultrawide resolution must be manually selected in the GUI or with the API, as detailed above.
- Ultrawide output resolutions currently only support 30Hz or 60Hz, other refresh rates such as 50Hz, 100Hz, 120Hz, or higher are not currently available for ultrawide output modes.
- In the Custom Layout designer there are no aspect ratio preset buttons for 21:9 or 32:9, Custom aspect ratio should be used, allowing you to manually configure the window size.

Specifications

- **Video Input Connectors:** 4 x HDMI Type A, 19-pin, female
- **Video Output Connectors:** 5 x HDMI Type A, 19-pin, female
- **Audio Output Connectors:** 1 x Optical (S/PDIF), 1 x 5-pin Phoenix connector
- **TCP/IP Port:** 1 x RJ45, female
- **RS-232 Serial Port:** 3 x 3-pin Phoenix connector
- **12v Trigger Port:** 1 x 2-pin Phoenix connector
- **IR Input Ports:** 1 x 3.5mm stereo jack
- **Rack Mount Kit:** wings for mounting MV41 into a 19" rack
- **Casing Dimensions (W x H x D):** 265mm x 30mm x 152mm (without connections)
- **Shipping Weight:** 1.5kg
- **Operating Temperature:** 32°F to 104°F (-5°C to +55°C)
- **Storage Temperature:** -4°F to 140°F (-25°C to +70°C)
- **Power Supply:** 1 x 12v/2A DC - screw connector

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

Package Contents

- 1 x MV41
- 1 x IR receiver
- 1 x IR remote control
- 1 x 5-pin phoenix connector
- 1 x 3-pin phoenix connector
- 1 x 2-pin phoenix connector
- 1 x 19" rack mounting kit
- 1 x Quick reference guide
- 1 x 12v/2A DC power supply

Maintenance

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

RS-232 Configuration and Telnet Commands

The MV41 can be controlled via serial and TCP/IP.

The default RS-232 communication settings are:

Baud rate: 57600
Data bit: 8
Stop bit: 1
Parity bit: none

The following pages list all available serial / IP commands.

Commonly used Serial Commands

There are several commands that are commonly used for control and testing:

STATUS	Status will give feedback on the switcher such as outputs on, type of connection etc...
PON	Power on
POFF	Power off
OUTON/OFF	Toggling the main output ON or OFF as required
Example:-	OUTON (This would turn the main output on)
OUT FRyy	(yy is the input)
Example:-	OUTFR04 (This would switch the main output to source input 4)

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 – Blustream commands do not require space between commands unless specified. There may be some programs that require spacing in order to work.
  - How the string should look is as follows OUTON
  - How the string may look if spaces are required: OUT{Space}ON

- Baud rate or other serial protocol settings not correct

RS-232 Configuration and Telnet Commands

COMMAND	ACTION
? / HELP	Print help information
STATUS	Print system status and port status
FWVER	Print All Firmware Version
UPTIME	Print System Uptime
TEMP	Print System Temperature
PON	Power On, System Run On Normal State
POFF	Power Off, System Run On Power Save State
REBOOT	Set System And Network Reboot
IR ON/OFF	Set System IR Control On Or Off
IR 5V	Set System IR Is 5V Power Supply Infrared Receiver
IR 12V	Set System IR Is 12V Power Supply Infrared Receiver
KEY ON/OFF	Set System KEY Control On Or Off
BEEP ON/OFF	Set Onboard Beep On Or Off
LED xx yy	Set Power LED Light Up Time xx=PON: When Device Is Powered On xx=POFF: When Device Is Powered Off yy=OFF: Set Power LED To Always Off yy=15: Set Power LED To Auto Turn Off After 15sec yy=30: Set Power LED To Auto Turn Off After 30sec yy=60: Set Power LED To Auto Turn Off After 60sec yy=ON: Set Power LED To Always On
RSB x	Set RS232 Baud Rate To x bps x=[0:115200 1:57600, 2:38400, 3:19200, 4:9600]
RESET	Reset System To Default Setting
RESET ALL	Reset System And Network To Default Setting (Should Type “Yes” To Confirm, “No” To Discard)
AUTO TRG x	Set The Trigger Method x On Input To Perform Auto Switching x=[01]: HDMI (5V) x=[02]: HDMI (TMDS)
AUTO FB yy	Set Fallback To yy When Active Signal Is Removed In Single Source Auto Switching Mode yy=00: Select Next Input Port yy=[01...04]: Select One Input Port
AUTO LAYOUT yy	Set Auto Layout Mode To yy yy=[01]: Single Source yy=[02]: Multiview
LAYOUT DUAL DF yy	Set Default Dual Window Layout To yy yy=[02]: Dual-LR (Left-By-Right) yy=[03]: Dual-TB (Top-By-Bottom) yy=[04]: PIP-UL (Upper-By-Left) yy=[05]: PIP-LL (Lower-By-Left) yy=[06]: PIP-UR (Upper-By-Right) yy=[07]: PIP-LR (Lower-By-Right) yy=[17]: User Defined
LAYOUT TRIPLE DF yy	Set Default Triple Window Layout To yy yy=[08]: Triple-L (Left) yy=[09]: Triple-R (Right) yy=[10]: Triple-T (Top) yy=[11]: Triple-B (Bottom) yy=[17]: User Defined
LAYOUT QUAD DF yy	Set Default Quad Window Layout To yy yy=[12]: Quad-S (Square) yy=[13]: Quad-L (Left) yy=[14]: Quad-R (Right) yy=[15]: Quad-T (Top) yy=[16]: Quad-B (Bottom) yy=[17]: User Defined

COMMAND	ACTION
TRG yy	Set Trigger To yy yy=[00]: Off yy=[01]: Low Level (0V) yy=[02]: High Level (5-12V) yy=[03]: Rising Edge yy=[04]: Falling Edge
TRG EVENT yy	Set Trigger Event To yy yy=[01...08]: Preset 1 To Preset 8 yy=[09]: Window 1 Pop-up yy=[10]: Window 2 Pop-up yy=[11]: Window 3 Pop-up yy=[12]: Window 4 Pop-up
TRG WIN FR yy	Set Trigger Window From yy yy=[01...04]: Input 1-4
TRG DIS yy	Set Trigger Timeout To yy yy=[01]: Level/Edge Changed yy=[02]: Timeout
TRG TIMEOUT yy	Set Trigger Disappear After yy yy=[1...600] Seconds
SEAMLESS SWITCH ON/OFF	Set Seamless Switching On Or Off
IN HDRCB xx	Set Input HDR To SDR Cb Ratio To xx xx=[0...8191]: Cb Value
IN HDRCR xx	Set Input HDR To SDR Cr Ratio To xx xx=[0...8191]: Cr Value
OUT ON/OFF	Set Output On Or Off
OUT xx BRIGHTNESS yy	Set Output xx Brightness To yy xx= NULL Or 1 yy=[0...255]: Brightness Value
OUT xx SATURATION yy	Set Output xx Saturation To yy xx= NULL Or 1 yy=[0...255]: Saturation Value
OUT xx CONTRAST yy	Set Output xx Contrast To yy xx= NULL Or 1 yy=[0...255]: Contrast Value
OUT xx HUE yy	Set Output xx Hue To yy xx= NULL Or 1 yy=[0...255]: Hue Value
OUT xx SWITCH yy	Set Output xx Auto Switching To yy xx= NULL Or 1 yy= AUTO yy= MAN

RS-232 Configuration and Telnet Commands

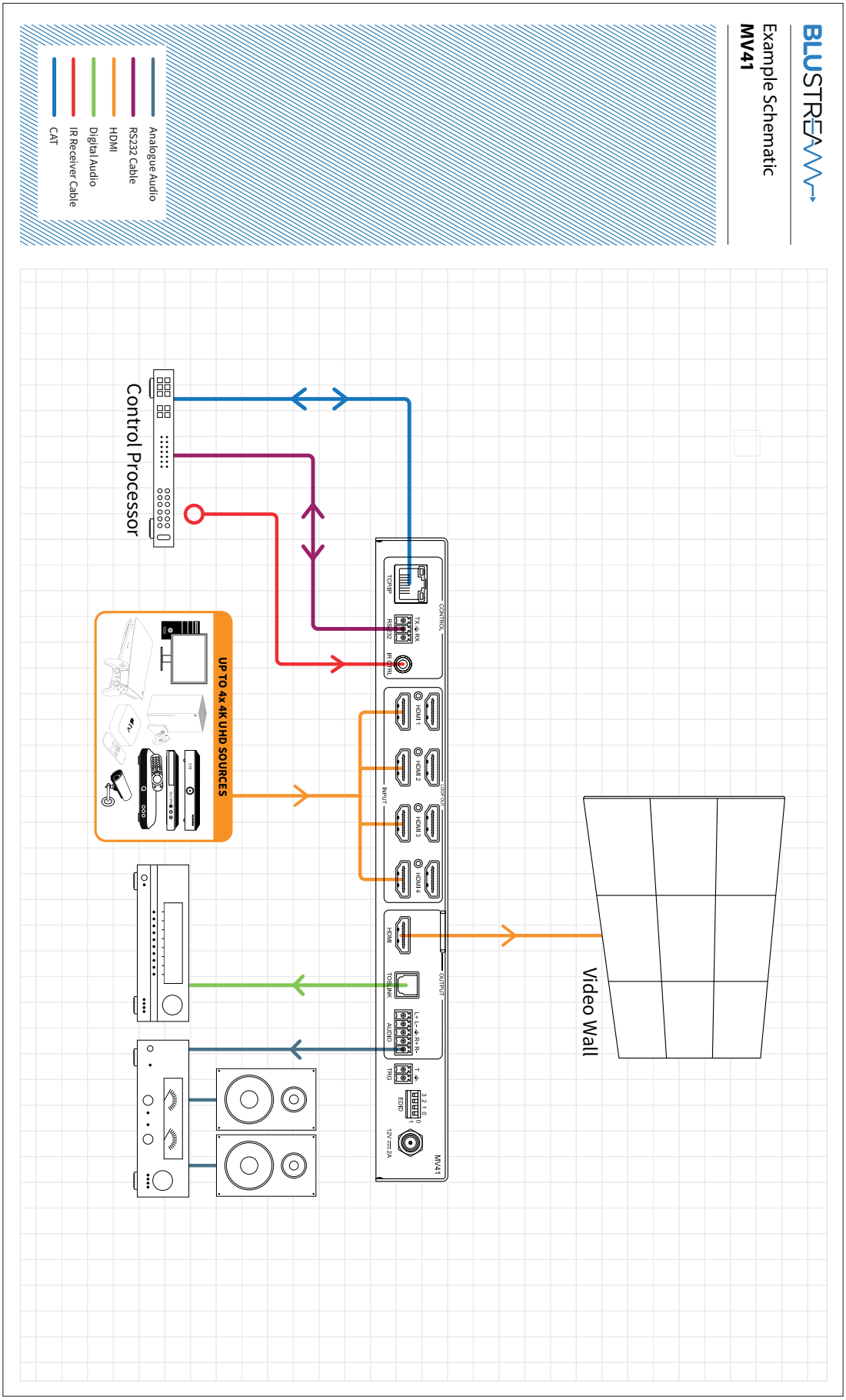
COMMAND	ACTION
OUT SCALING yy	Set Output Video Mode yy yy=[01]: Auto yy=[02]: 3840x2160p60Hz(2160p60) yy=[03]: 3840x2160p50Hz(2160p50) yy=[04]: 4096x2160p60Hz yy=[05]: 4096x2160p50Hz yy=[06]: 3840x2160p30Hz(2160p30) yy=[07]: 1920x1080p60Hz(1080p60) yy=[08]: 1920x1080p50Hz(1080p50) yy=[09]: 1920x1080i60Hz(1080i60) yy=[10]: 1920x1080i50Hz(1080i50) yy=[11]: 1280x720p60Hz(720p60) yy=[12]: 1280x720p50Hz(720p50) yy=[13]: 1360x768p60Hz yy=[14]: 1280x800p60Hz yy=[15]: 1920x1200p60Hz(RB) yy=[16]: 1024x768p60Hz yy=[17]: 3600x960p60Hz yy=[18]: 3840x1600 21:9 60Hz RGB 4:4:4 8-bit yy=[19]: 3840x1600 21:9 60Hz RGB 4:4:4 10-bit yy=[20]: 3840x1600 21:9 60Hz 4:2:0 10-bit yy=[21]: 5120x2160 (5K2K) 21:9 30Hz RGB 4:4:4 8-bit yy=[22]: 5120x1440 32:9 60Hz 4:2:0 10-bit yy=[23]: 3440x1440 21:9 60Hz RGB 4:4:4 8-bit yy=[24]: 3440x1440 21:9 60Hz RGB 4:4:4 10-bit yy=[25]: 2560x1080 21:9 60Hz RGB 4:4:4 8-bit yy=[26]: 2560x1080 21:9 60Hz RGB 4:4:4 10-bit yy=[27]: 5120x2880 (5K) 21:9 30Hz 4:2:0 8-bit yy=[28]: 5120x1440 32:9 60Hz 4:4:4 8-bit
LOOPOUT xx ON/OFF	Set Loopout:xx On Or Off xx=00: Select All Loopout Port xx=[01...04]: Select One Loopout Port
LOOPOUT xx SCALING yy	Set Loopout:xx Video Mode yy xx=00: Select All Loopout Port xx=[01...04]: Select One Loopout Port yy=[01]: Set Loopout Port Video Mode Bypass yy=[02]: Set Loopout Port Video Mode Force_1080p yy=[03]: Set Loopout Port Video Mode Auto (Match_TV)
OUT FR yy	Set Output From Input:yy yy=[01...04]: Select One Input Port
OUT LAYOUT xx FR aa bb cc dd	Set Output Layout Index:xx From Input:aa/bb/cc/dd xx=[01..16]: Select Layout Index aa=[01...04]: Select One Input Port For Window 1 Source bb=[01...04]: Select One Input Port For Window 2 Source cc=[01...04]: Select One Input Port For Window 3 Source dd=[01...04]: Select One Input Port For Window 4 Source Note: aa, bb, cc, dd Are Optional

COMMAND	ACTION
AUDIO FR yy	Set Output Audio From Input yy yy=00: Audio Mute yy=[01...04]: Select One Input Port yy=[05]: Window 1 yy=[06]: Window 2 yy=[07]: Window 3 yy=[08]: Window 4
EDID xx CP yy	Set Input:xx EDID Copy From Output:yy xx=00: Select All Input Port xx=[01...04]: Select One Input Port yy=[01...04]: Select One Loopout Port yy=05: Select Output Port
EDID xx DF zz	Set Input:xx EDID To Default EDID:zz xx=00: Select All Input Port xx=[01...04]: Select One Input Port zz=00: HDMI 1080p@60Hz, Audio 2CH PCM (default) zz=01: HDMI 1080p@60Hz, Audio 5.1CH DTS/DOLBY zz=02: HDMI 1080p@60Hz, Audio 7.1CH DTS/DOLBY/HD zz=03: HDMI 1080i@60Hz, Audio 2CH PCM zz=04: HDMI 1080i@60Hz, Audio 5.1CH DTS/DOLBY zz=05: HDMI 1080i@60Hz, Audio 7.1CH DTS/DOLBY/HD zz=06: HDMI 1080p@60Hz/3D, Audio 2CH PCM zz=07: HDMI 1080p@60Hz/3D, Audio 5.1CH DTS/DOLBY zz=08: HDMI 1080p@60Hz/3D, Audio 7.1CH 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: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 2CH PCM zz=13: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 5.1CH DTS/DOLBY zz=14: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD zz=15: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2CH PCM zz=16: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 5.1CH DTS/DOLBY zz=17: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 7.1CH DTS/DOLBY/HD zz=18: HDMI 4K@60Hz 4:4:4, HDR 10-bit, Audio 2CH PCM zz=19: HDMI 4K@60Hz 4:4:4, HDR 10-bit, Audio 5.1CH DTS/DOLBY zz=20: HDMI 4K@60Hz 4:4:4, HDR 10-bit, Audio 7.1CH DTS/DOLBY/HD zz=21: HDMI 4K@60Hz 4:4:4, HDR 12-bit, Audio 2CH PCM zz=22: HDMI 4K@60Hz 4:4:4, HDR 12-bit, Audio 5.1CH DTS/DOLBY zz=23: HDMI 4K@60Hz 4:4:4, HDR 12-bit, Audio 7.1CH DTS/DOLBY/HD zz=24: HDMI 4K@60Hz 4:4:4, HDR 10-bit (Inc DV), Audio 2CH PCM

RS-232 Configuration and Telnet Commands

COMMAND	ACTION
EDID xx DF zz (continued)	zz=25: HDMI 4K@60Hz 4:4:4, HDR 10-bit (Inc DV), Audio 5.1CH DTS/DOLBY zz=26: HDMI 4K@60Hz 4:4:4, HDR 10-bit (Inc DV), Audio 7.1CH DTS/DOLBY/HD zz=27: HDMI 4K@60Hz 4:4:4, HDR 12-bit (Inc DV), Audio 2CH PCM zz=28: HDMI 4K@60Hz 4:4:4, HDR 12-bit (Inc DV), Audio 5.1CH DTS/DOLBY zz=29: HDMI 4K@60Hz 4:4:4, HDR 12-bit (Inc DV), Audio 7.1CH DTS/DOLBY/HD zz=30: DVI 1280x1024@60Hz, Audio None zz=31: DVI 1920x1080@60Hz, Audio None zz=32: DVI 1920x1200@60Hz, Audio None zz=33: HDMI 1920x1200@60Hz, Audio 2CH PCM/6CH PCM zz=34: User EDID 1 zz=35: User EDID 2 zz=36: EDID Pass-through (Copy From Output)
PRESET STATUS	Print Preset Config Status
PRESET pp SAVE	Save Current Config To Preset:pp pp=[01...08]: Select Preset Index
PRESET pp APPLY	Apply Preset:pp Config pp=[01...08]: Select Preset Index
PRESET pp DEL	Delete Preset:pp pp=[01...08]: Select Preset Index
NET DHCP ON/OFF	Set Auto IP (DHCP) On Or Off
NET IP xxx.xxx.xxx.xxx	Set IP Address
NET GW xxx.xxx.xxx.xxx	Set Gateway Address
NET SM xxx.xxx.xxx.xxx	Set Subnet Mask Address
NET TCPPORT xxxx	Set TCP/IP Port
NET TCPPORT ON/OFF	Set TCP/IP On Or Off
NET TN xxxx	Set Telnet Port
NET TN ON/OFF	Set Telnet On Or Off
NET RB	Set Network Reboot And Apply New Config
NET DNS xxxx	Set DNS Domain Name To xxxx

Schematic


BLUSTREAM
Example Schematic
MV41
Analogue Audio
RS232 Cable
HDMI
Digital Audio
IR Receiver Cable
CAT
Control Processor
UP TO 4x 4K UHD SOURCES
Video Wall
MV41

Certifications

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION - changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CANADA, INDUSTRY CANADA (IC) NOTICES

This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

CANADA, AVIS D'INDUSTRY CANADA (IC)

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003.

Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

CORRECT DISPOSAL OF THIS PRODUCT

This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.





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