

► **MFP72**
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.

Safety And Performance Notice

Do not substitute or use any other power supply other than the enclosed unit, or a Blustream approved replacement.

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

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Introduction

Our MFP72 is a multi-format presentation switcher with in-built video scaling, audio embedding, audio de-embedding and EDID management.

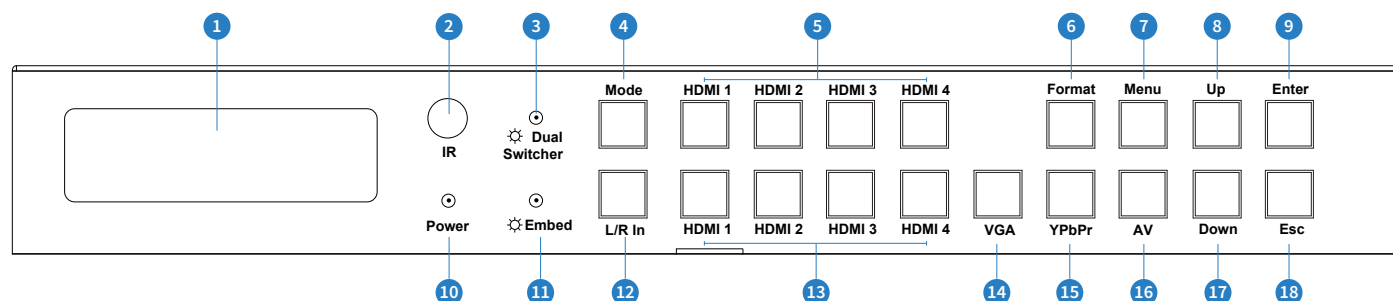
The MFP72 works in 2 modes, first as a 7 input dual-output switcher, alternatively each output can work independently with output 1 routing the 4x HDMI inputs only and output 2 switching all 7 video/audio inputs.

With control of the switcher using the front-panel push buttons, IR remote control or RS-232 interface it is an ideal solution for commercial installations.

FEATURES:

- Switcher can function in 2 modes:-
 - **Splitter** mode - Both HDMI output 1 & 2 display the same selected input.
 - **Matrix Switcher** mode - HDMI inputs are independently switchable to HDMI outputs 1 & 2. HDMI output 1 has access to HDMI inputs 1-4 (HDMI signal pass-through including 4K resolution), whilst output 2 has access to all HDMI and Analogue video inputs with associated audio.
- Built-in video scaling, both up-scaling (maximum of 1080p) and down-scaling capabilities (including 4K to lower resolutions).
- Video inputs support industry standard video resolutions including VGA-WUXGA and 480i-4K.
- Scaled video output resolutions include 720p, 1080p, 1280x1024, 1024x768, 1360x768, 1440x900 & 1680x1050.
- Audio embedding - Independent Analogue L/R audio input can be embedded to HDMI outputs + Analogue L/R audio and Coaxial digital outputs concurrently (Feature available on HDMI outputs 1 + 2 in **Splitter** mode and HDMI output 2 only in **Matrix Switcher** mode).
- HDMI audio breakout to Analogue L/R audio and Coaxial digital outputs concurrently (linked to HDMI output 2 when in **Matrix Switcher** mode).
- Volume control of HDMI, Analogue L/R audio and Coaxial digital outputs.
- Supports all known HDMI audio formats on HDMI pass-through, including Dolby TrueHD, Dolby Atmos, Dolby Digital Plus and DTS-HD Master Audio transmission.
- Front panel display for status feedback.
- Control via front panel, IR and RS-232.
- 3rd Party drivers available for all major home control brands.
- Advanced EDID management.
- HDCP compliant.

Front Panel

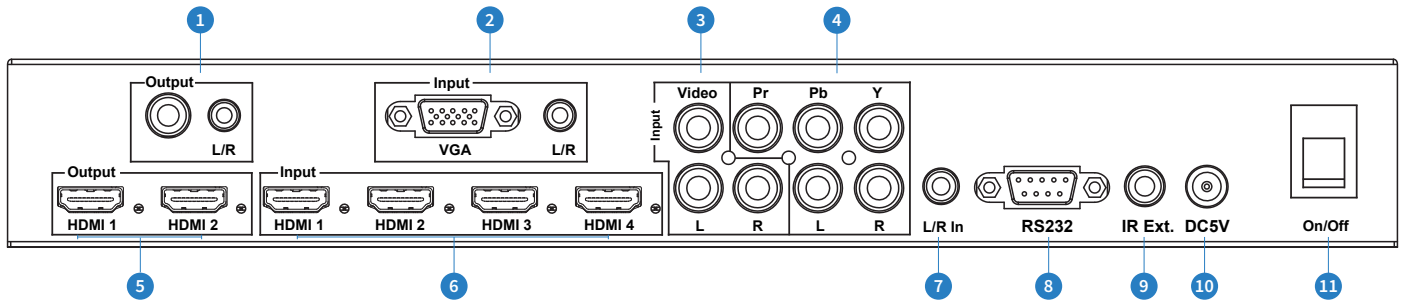


- 1 LCD display - Shows the status of input-output selection, EDID info etc.
- 2 IR receiver window.
- 3 Matrix Switcher LED indicator - When the LED is lit, **Matrix Switcher** mode is active and both HDMI outputs switch independently. When the LED is not lit the Matrix switcher is in **Splitter** mode and both HDMI outputs will display the same selected video input.
- 4 Mode button - Press to switch between **Matrix Switcher** and **Splitter** modes.
- 5 HDMI input selection buttons for HDMI output 1 when in **Matrix Switcher** mode.
- 6 Format set button - Press to set the output resolution.
- 7 Menu button - Press to enter EDID set mode, volume setting or F/W information.
- 8 Up selection button - Press to change segment's value.
- 9 Enter button - Press to confirm the settings.
- 10 Power LED indicator - Indicate the status of power.
- 11 Embed LED indicator - When the LED is lit, **Audio embed** mode is active. When active the L/R Analogue input will be embedded onto the HDMI outputs. In **Splitter** mode analogue audio is embedded to both of the HDMI outputs with the ability to adjust the volume. In **Matrix Switcher** mode Analogue audio will only be embedded onto HDMI output 2.
- 12 L/R in selection button - Press to embed the Analogue L/R audio input to the HDMI outputs (as above).
- 13 HDMI input selection buttons 1 to 4 - Press to select the HDMI input switched to output 2 in **Matrix Switcher** mode, or both HDMI outputs in **Splitter** mode.
- 14 VGA input selection button - Press to select the VGA input with associated Analogue L/R audio.
- 15 YPbPr (Component video) input selection button - Press to select the YPbPr input with associated Analogue L/R audio input.
- 16 AV input selection button - Press to select the AV input with associated Analogue L/R audio input.
- 17 Down selection button - Press to change segment's value.
- 18 ESC-Press to exit the menu.

Notes:

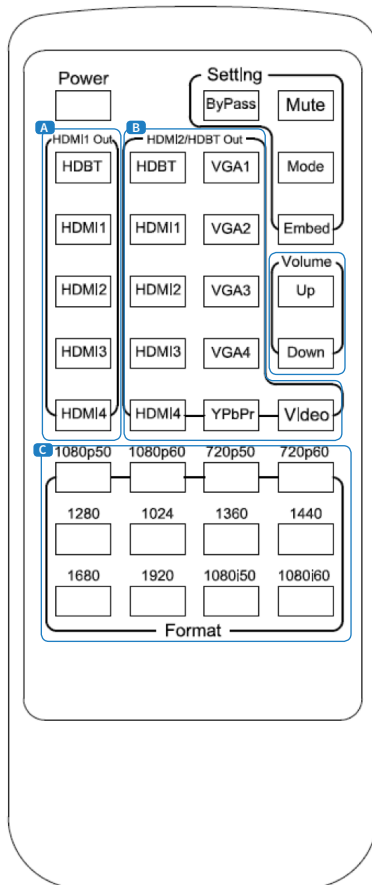
- Volume can be changed using IR, RS-232 control or from the front panel UP and DOWN buttons when in the volume menu.
- During F/W mode, pressing the Enter button will show the current F/W information.

Rear Panel



- 1 Coaxial digital and analogue audio outputs - Extracted audio will always follow HDMI output 2 source selection. *Note: input must be 2ch PCM for Analogue audio output to work.*
- 2 VGA input - VGA input with associated L/R analogue audio input.
- 3 AV input - Composite video input with associated L/R analogue audio input.
- 4 YPbPr input - YPbPr input with associated L/R analogue audio input.
- 5 HDMI outputs 1 and 2.
- 6 HDMI input 1 to 4 - Connect to HDMI sources.
- 7 L/R In - Enables Analogue audio to be embedded onto both HDMI outputs in Splitter mode and HDMI output 2 in Matrix Switcher mode.
- 8 RS232 port - For control of the switcher from PC or control processor.
- 9 IR Ext. - Connect to Blustream IR receiver or control processor when using Blustream IRCAB cable (sold separately).
- 10 Power port - Use supplied 5V/2A DC power supply.
- 11 Power switch - Power on/off the unit.

Remote Control Description



OUTPUT AND INPUT SELECTION

- A Source selection for HDMI output 1 when in **Matrix Switcher** mode.
- B Source selection for HDMI output 2 when in **Matrix Switcher** mode or both HDMI outputs when in **Splitter** mode.

VIDEO OUTPUT RESOLUTION

- C. The MFP72 includes an in-built video scaler. To change the HDMI output video resolution press the required resolution button on the bottom of the Blustream remote control.

Settings

- D. **Bypass:** Audio on HDMI outputs is from HDMI input selected.
- E. **Mute:** Mutes the audio on all outputs (HDMI, Coaxial digital and Analogue audio).
- F. **Mode:** Switches between **Matrix Switcher** mode and **Splitter** mode.
- G. **Embed:** Audio on HDMI outputs is from L/R Analogue audio input (3.5mm Jack).

VOLUME CONTROL

- H. Adjust the audio Volume on all outputs (HDMI, Coaxial digital and Analogue audio).

InfraRed (IR) Distribution

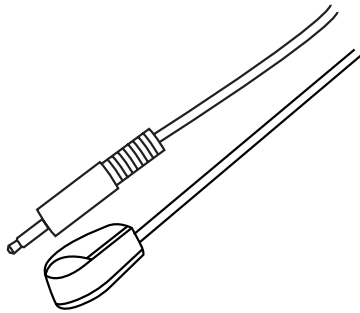
The Blustream range of matrix and switcher products include multiple options for control and routing of IR.

IMPORTANT: Blustream InfraRed products are all 5V and NOT compatible with alternate manufacturers InfraRed solutions. When using third party 12V IR control solutions please use supplied Blustream IRCAB cable for IR conversion.

Each Blustream Presentation Switcher and HDBaseT receiver is supplied with all necessary IR hardware required and includes:

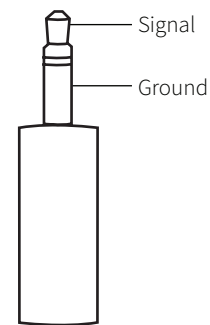
IR Emitter

Blustream IR Emitter designed for discrete IR control of hardware



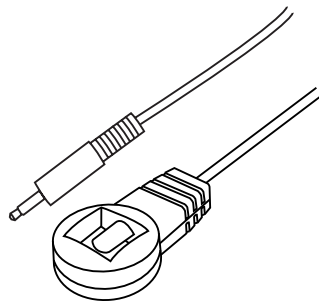
Infrared 3.5mm Pin-Out

IR Emitter - Mono 3.5mm

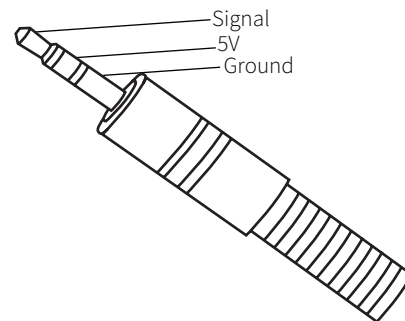


IR Receiver

Blustream IR receiver to receive IR signal and pass-through Blustream products



IR Receiver - Stereo 3.5mm

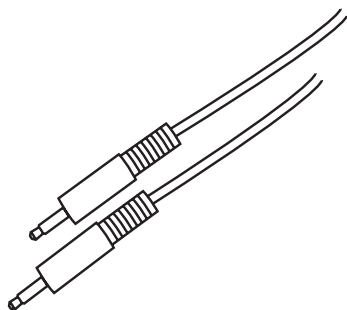


IR Control Cable

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

Will work with 12V IR third party products.

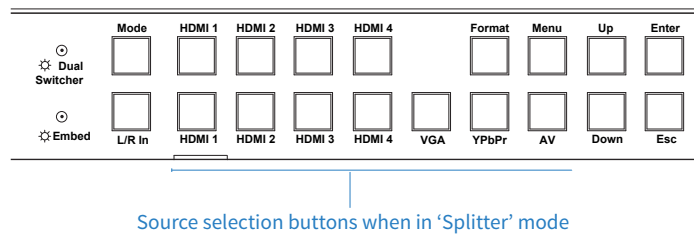
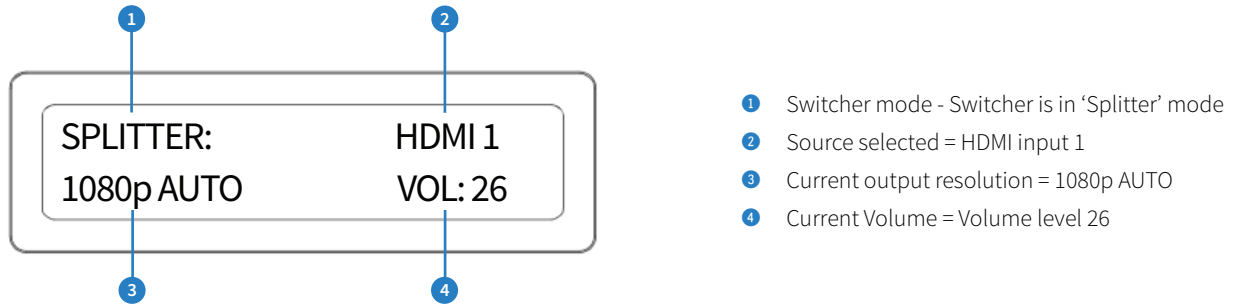
Note: Cable is directional as indicated



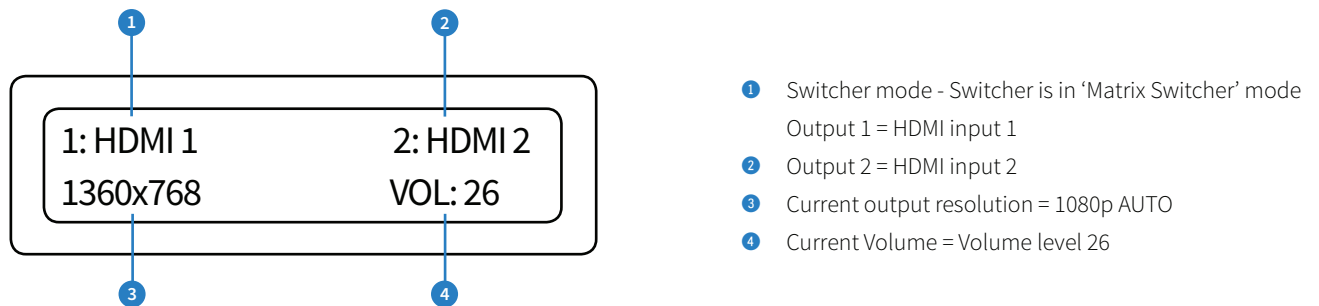
Presentation Switcher Front Panel Display

The front panel display gives information on the current status of the switcher:

Splitter Mode:

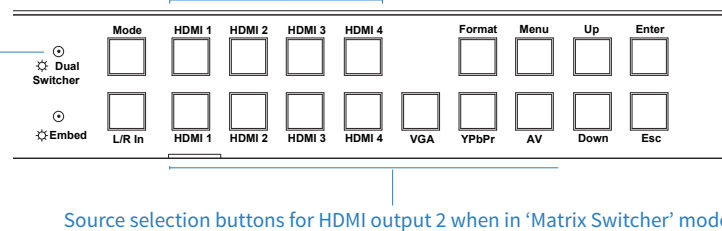


Matrix Switcher Mode:



Source selection buttons for HDMI output 1 when in 'Matrix Switcher' mode
 (HDMI inputs 1-4 are straight pass-through with no scaling)

'Matrix Switcher mode'
 Status LED will be lit when this mode is active



Adjusting the video output resolution

The MFP72 has an in-built video scaler allowing you to alter the resolution of the video output.

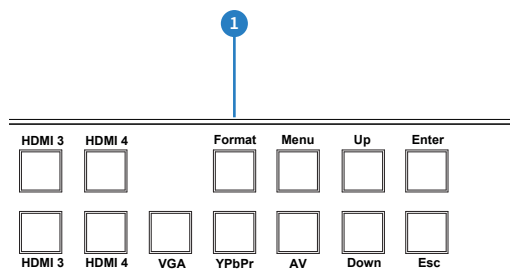
When in **'Splitter'** mode both the HDMI outputs can be processed via the video scaler, allowing you to alter the resolution of both outputs. (*Note - This is subject to turning on/off the scaler using the 'Bypass' command - see page 13 for further details).

When in **'Matrix Switcher'** mode only HDMI output 2 can be processed via the video scaler. HDMI output 1 is a straight pass-through video signal with no video scaling. HDMI output 1 has access to the 4x HDMI inputs only when in this mode. (*Note - HDMI output 2 can bypass the video scaler when selecting HDMI 1-4 inputs using the 'Bypass' command - see page 17 for further details).

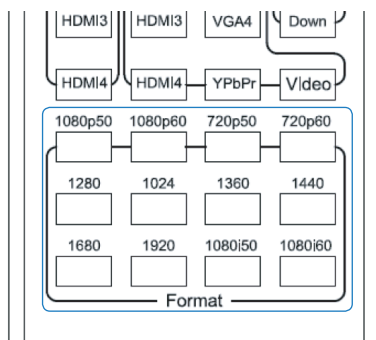
Changing the output video resolution

The MFP72 video output resolution can be altered in 3 ways:

- 1 Front panel control - Press the 'FORMAT' button to scroll through output resolutions



- 2 MFP72 remote control



The MFP72 remote control has fixed output video resolutions. To change the resolution simply select the required video format required.

- 3 Using Blustream RS-232/Telnet commands - Please see page 13 for detailed commands

EDID Control

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 determine what the best resolution is to output.

While the objective of EDID is to make connecting a digital display to a source a simple plug and play procedure issues do 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 potentially work around compatibility issues associated with some display and source combinations.

The EDID configuration can be altered in 2 ways:

- 1 Using EDID dip-switches on the rear panel of the unit. Please see table below for settings.
Note: You must power-cycle the switcher after changes have been made in order for the EDID settings to update.
- 2 Using Matrix Front Panel Buttons
 - a. Press **MENU** button
 - b. Panel will display 'EDID settings'. Press **SELECT** button
 - c. Select the input you wish to fix the EDID on or select 'All'. Use **UP/DOWN** buttons to toggle selection and **SELECT** button to confirm
 - d. Select video resolution required (4K, 1080p, 3D etc). Use **UP/DOWN** buttons to toggle selection and **SELECT** button to confirm
 - e. Select audio format required (2.0ch, 5.1ch, 7.1ch). Use **UP/DOWN** buttons to toggle selection and **SELECT** button to confirm

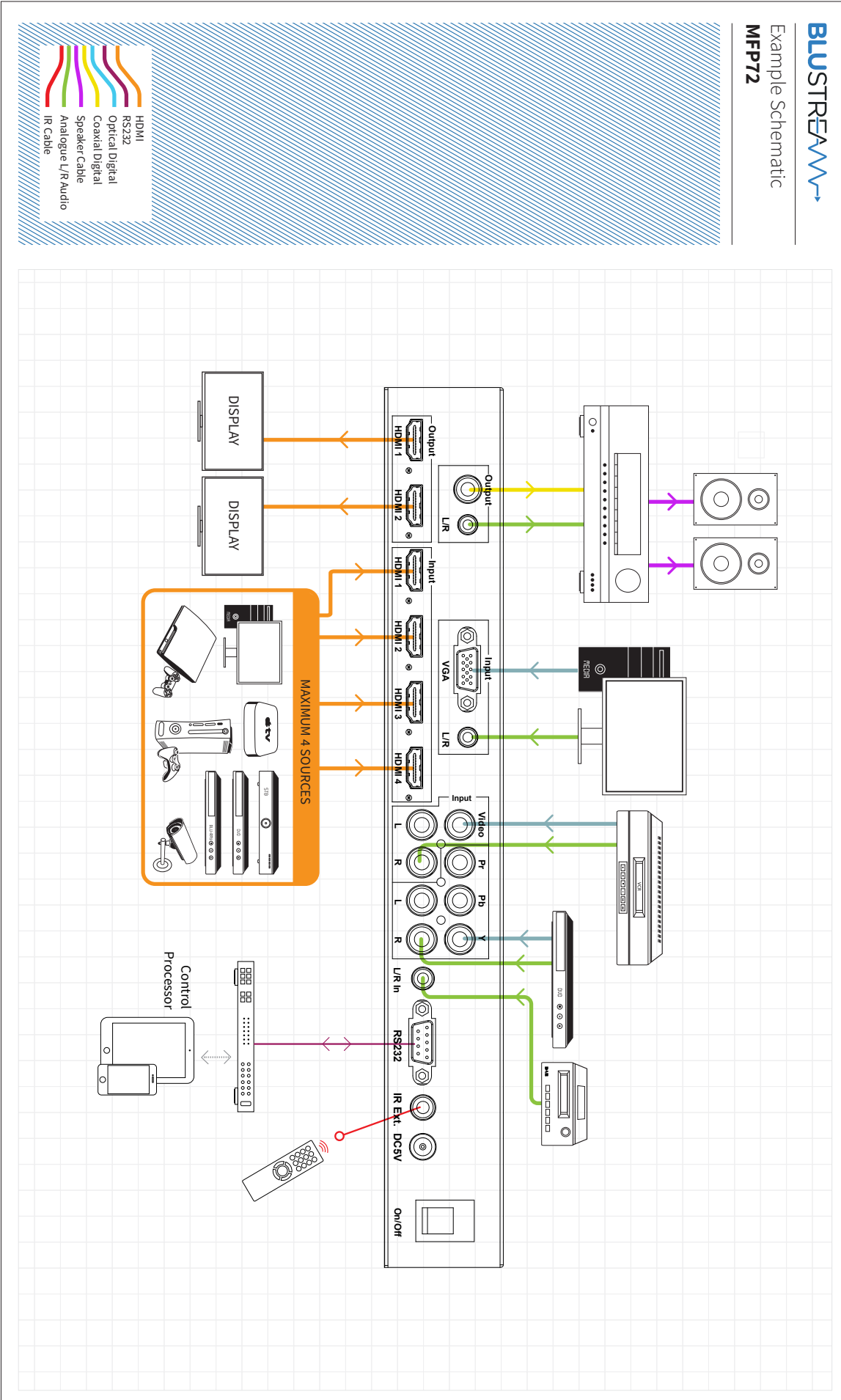
EDID Dip-switch settings:

- [DIP]=0000:** HDMI 1080p@60Hz, Audio 2ch PCM
- [DIP]=0001:** HDMI 1080p@60Hz, Audio 5.1ch PCM/DTS/Dolby
- [DIP]=0010:** HDMI 1080p@60Hz, Audio 7.1ch PCM/DTS/Dolby/HD
- [DIP]=0011:** HDMI 1080i@60Hz, Audio 2ch PCM
- [DIP]=0100:** HDMI 1080i@60Hz, Audio 5.1ch PCM/DTS/Dolby
- [DIP]=0101:** HDMI 1080i@60Hz, Audio 7.1ch PCM/DTS/Dolby/HD
- [DIP]=0110:** HDMI 1080p 3D@60Hz, Audio 2ch PCM
- [DIP]=0111:** HDMI 1080p 3D@60Hz, Audio 5.1ch PCM/DTS/Dolby
- [DIP]=1000:** HDMI 1080p 3D@60Hz, Audio 7.1ch PCM/DTS/Dolby/HD
- [DIP]=1001:** HDMI 4K@30Hz, Audio 2ch PCM
- [DIP]=1010:** HDMI 4K@30Hz, Audio 5.1ch PCM/DTS/Dolby
- [DIP]=1011:** HDMI 4K@30Hz, Audio 7.1ch PCM/DTS/Dolby/HD
- [DIP]=1100:** DVI 1280x1024, Audio 2ch PCM
- [DIP]=1101:** DVI 1920x1080, Audio 5.1ch PCM/DTS/Dolby
- [DIP]=1110:** DVI 1920x1200, Audio 7.1ch PCM/DTS/Dolby/HD
- [DIP]=1111:** HDMI EDID copy (EDID copied from HDMI output 2 display)

NOTE: *If the source selected is a VGA input the switcher will automatically output the best resolution possible.*

BLUSTREAM

Example Schematic
MFP72



Specifications:

Video Input Connectors: 4x HDMI Type A, 1x VGA, 1xYPbPr, 1x Composite

Video Output Connectors: 2x HDMI Type A

Audio Input Connectors: 2x 3.5mm Analogue audio stereo jack, 4x Analogue audio RCA (2 x L/R)

Audio Output Connectors: 1x 3.5mm Analogue audio stereo jack, 1x SPDIF Coaxial digital

RS-232 serial port: 1x DB 9 connector

IR Input ports: 1x 3.5mm stereo jack

Dimensions (W x H x D): 323mm x 135mm x 44mm, without feet

Shipping Weight: 1.5Kg

Operating Temperature: 32°F to 104°F (0°C to 40°C)

Storage Temperature : -4°F to 140°F (-20°C to 60°C)

Power Supply: DC 5V/2A

Package Contents:

- 1x MFP72
- 1x 5V/2A power supply
- 1x Remote control
- 1x IR Receiver
- 1x mounting kit

Maintenance

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

RS232 and Telnet Commands

The Blustream MFP72 can be controlled via RS-232/serial. The following pages list all available serial commands for the MFP72. Details of RS232 pin assignment can be found below.

Commonly used Serial commands:

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

STATUS	Status will give feedback on Matrix such as zones on, type of connection etc
PON	Power on
POFF	Power off
OUTxxON	(xx is the zone number you wish to turn on)
Example:-	OUT01ON (This would turn output one back on)
OUTxxFRyy	(xx is the zone out, yy is the input)
Example:-	OUT01FR04 (This would switch output 1 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 OUT01ON
 - How the string may look if spaces are required: OUT{Space}01{Space}ON
- Baud rate or other serial protocol settings not correct - please see below for Switcher settings

RS-232 Pin Assignment

MFP72		REMOTE CONTROL CONSOLE	
PIN	Assignment	PIN	Assignment
1	NC	1	NC
2	Tx	2	Rx
3	Rx	3	Tx
4	NC	4	NC
5	GND	5	GND
6	NC	6	NC
7	NC	7	NC

Baud Rate: 57600 bps

Data Bit: 8-bit

Parity: None

Stop Bit: 1-bit

Flow Control: None

RS232 and Telnet Commands

RS232 Command	Description
?	Print Help Information
HELP	Print Help Information
STATUS	Print System Status And Port Status
PON	Power On, System Run On Normal State
POFF	Power Off, System Run On Power Save State
IRON/OFF	Set System IR Control On Or Off
KEYON/OFF	Set System KEY Control On Or Off
DBGON/OFF	Set Debug Mode On Or Off
BEEPON/OFF	Set Onboard Beep On Or Off
RESET	Reset System To Default Setting (Type “Yes” To Confirm, “No” To Discard)
OUTxxFRyy	Set OUTPUT:xx From INPUT:yy
OUTSP/MX	Set OUTPUT To Splitter or Matrix Mode
EDIDxxCPyy	Copy EDID from output (yy) to input (xx) Both yy & xx can be set individually (01-08) or as ALL (00)
EDIDxxDFzz	Set Input:xx EDID To Default EDID:zz xx=00: Select All INPUT Port xx=[01...04]: Select One INPUT Port yy=[01...02]: Select One OUTPUT Port 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 4K2K, Audio 2CH PCM zz=10: HDMI 4K2K, Audio 5.1CH PCM/DTS/DOLBY zz=11: HDMI 4K2K, Audio 7.1CH PCM/DTS/DOLBY/HD zz=12: DVI 1280x1024@60Hz, Audio None zz=13: DVI 1920x1080@60Hz, Audio None zz=14: DVI 1920x1200@60Hz, Audio None

RS232 and Telnet Commands (continued)

RS232 Command	Description
AUDSCAORG	Scaler Audio Input Follow Port Selection
AUDSCAANA	Scaler Audio Input From Analog L/R Signal
AUDxx	Set Scaler Audio Volume xx=[00...30]: Volume Value
OUTBYPON/OFF	"Only applicable to HDBaseT & HDMI1-4 inputs In <i>Splitter mode</i> : When BYP is ON video is pass through without scaling When BYP is OFF video is scaled at set resolution In <i>Matrix mode</i> : HDMI output (out1) is pass-through without scaling. Bypass command is only applicable to HDBaseT out when in this mode"
OUTFREQmm	Set Output Frequency Mode (when resolution is 720p or 1080p): mm=AUTO: Output freq auto matches Input freq mm=FORCE: Set Output freq manually (using previous RES rr Select command)
AUDHDMIyyORG	Select between HDMI audio or associated L/R analogue audio. AUDHDMIyyORG sets to original HDMI audio
AUDHDMIyyANA	Select between HDMI audio or associated L/R analogue audio. AUDHDMIyyANA sets audio to associated embedded L/R analogue audio
AUDHDMIyyAUTO	Select between HDMI audio or associated L/R analogue audio. AUDHDMIyyAUTO sets audio to embedded L/R analogue audio when DVI video or HDMI audio when HDMI.
OUTRESrr	Set Scaler Output Resolution rr=01: 1080P@50Hz rr=02: 1080P@60Hz rr=03: 720P@60Hz rr=04: 720P@50Hz rr=05: 1280x1024@60Hz rr=06: 1024x768@60Hz rr=07: 1360x768@60Hz rr=08: 1440x900@60Hz rr=09: 1680x1050@60Hz

Notes



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