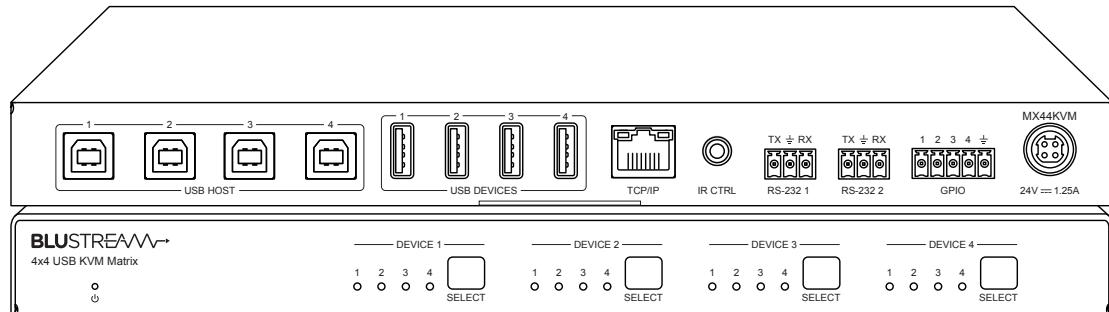




► MX44KVM

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.

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Introduction

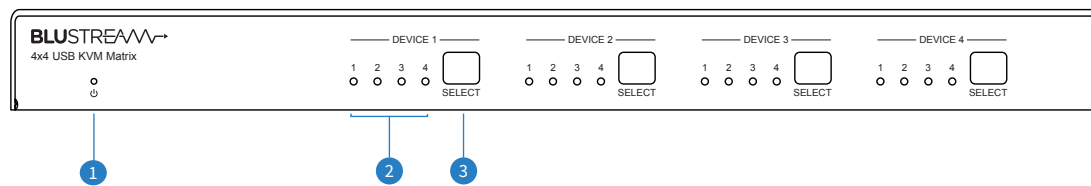
Our 4x4 USB 3.0 KVM Matrix offers unprecedented performance and value for the custom and commercial installation market. The MX44KVM is a USB 3.0 Matrix package allowing 4x USB peripheral devices to be shared between 4x host devices, supporting plug-and-play capabilities, and USB data transfer rates up to 5Gbps.

The Matrix provides advanced features including cascading of multiple MX44KVM units, GPIO functionality for 3rd party product triggers, an in-built web browser interface module for control and configuration of the Matrix, along with RS-232 for seamless control integration. An RS-232 loop-through connection allows for the MX44KVM to be intrinsically linked to any Blustream video matrix product for the addition of KVM support to our video-only switching products.

FEATURES:

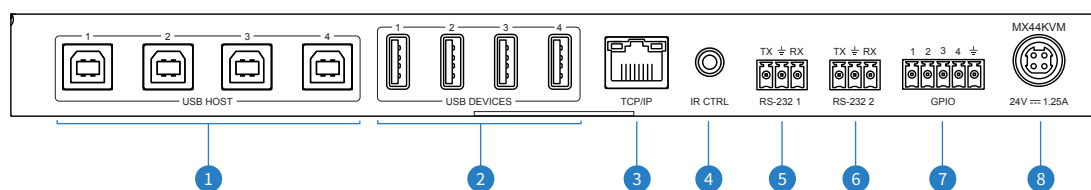
- 4x4 USB KVM Matrix allowing up to 4x USB peripheral devices to be shared between 4x host devices
- USB 3.0 connectivity with data transfer rates up to 5Gbps
- Backwards compatible with USB 2.0 and 1.1
- Plug-and-play with no drivers, downloads, or software required
- USB-A connections provide 5V 900mA
- Features 4x configurable GPIO ports for integration with 3rd party products
- Features RS-232 loop-through for repetition of incoming RS-232 commands to additional Blustream products
- Assignable inputs and outputs allowing automated switching when used with existing Blustream Matrix products
- Web interface module for control and configuration of the MX44KVM
- Control via front panel, IR, RS-232, and TCP/IP

Front Panel Description



- ❶ Power LED - Illuminates blue when the device is powered on. Illuminates red when the device is powered off
- ❷ Selection LED – The illuminated number corresponds to the USB Host the selected USB Device is routed to
- ❸ Select Button - Press to cycle the selected USB Device through each USB Host output

Rear Panel Description



- ❶ USB Host - Connects to USB port of Host device
- ❷ USB Device - Connects to USB Devices or peripherals
- ❸ TCP/IP - RJ45 connector for TCP/IP and Web-GUI control of the Matrix
- ❹ IR Control Input - 3.5mm stereo connector to connect to Blustream IR receiver for IR control of the Matrix
- ❺ RS-232 Port 1 - 3-pin Phoenix connector for direct RS-232 control of the Matrix
- ❻ RS-232 Port 2 - 3-pin Phoenix connector for RS-232 pass-through to cascaded MX44KVM or a Blustream HDMI/HDBaseT Matrix
- ❼ GPIO Port - 5-pin Phoenix connector for input sense/output relay/contact closure control of 3rd party devices
- ❽ 24V/1.25A DC power input 4-pin DIN connector

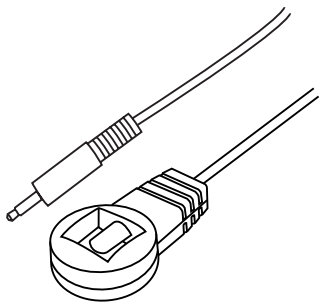
Infrared (IR) Control

The Blustream range of matrix products include Matrix control via IR.

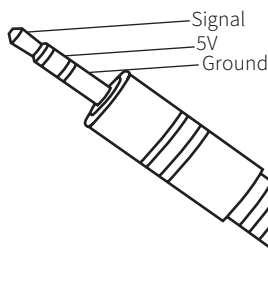
IMPORTANT: Blustream Infrared products are all 5V and NOT compatible with alternative manufacturers Infrared solutions. When using third party 12V IR control solutions please use the Blustream IRCAB cable for IR conversion.

IR Receiver - IRR

Blustream 5V IR receiver to receive an IR signal for control of the matrix.



IR Receiver - Stereo 3.5mm

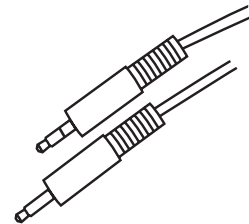


IR Control Cable - IRCAB (supplied)

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

Compatible with 12V IR 3 party products.

Please Note: cable is directional as indicated.



Web-GUI Control

This following pages outlines the operation of the Matrix Web-GUI. Connect the TCP/IP RJ45 socket to the local network in order to access the products Web-GUI, or connect a PC directly to the TCP/IP port for initial configuration.

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

Default IP Address: [192.168.0.200](#)

Default Username: [blustream](#)

Default Password: [1234](#) or [@BlS1234](#)

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 sources for each zone. Guest access can be changed by the Admin, limiting inputs or outputs as necessary.

User Accounts - 7x 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 Matrix, as well as assigning users with individual permissions.

Login Page

The Login Page allows a User or Admin to login and access additional functionality. This page displays the current firmware version of both the Matrix and Web-GUI.

Control Login

BLUSTREAM

Username
Please Enter

Password
Please Enter

Login

MX44KVM
GUI: V0.0a
Firmware: V0.0a

Guest Control Page

The Guest Control Page allows a guest to change inputs for each zone without needing to be logged into the matrix. Simply select the square that corresponds with the input and zone needing to be changed.

There is also a power button on the lower right corner to turn the Matrix on or off.

Control Login

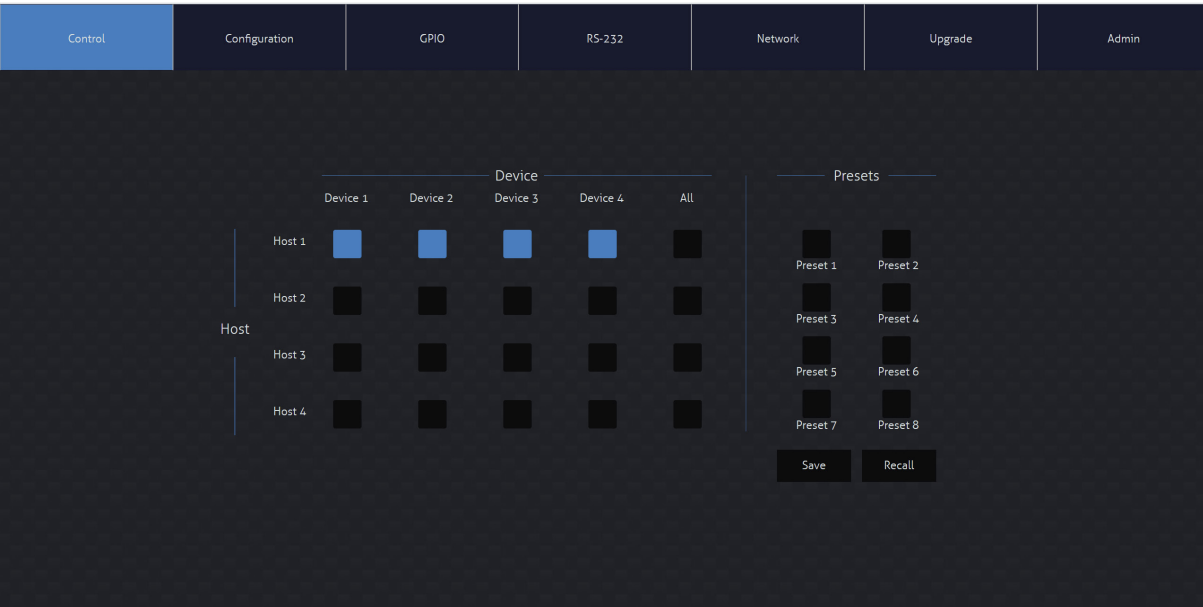
Device
Device 1 Device 2 Device 3 Device 4 All

Host
Host 1 Host 2 Host 3 Host 4

Presets
Preset 1 Preset 2
Preset 3 Preset 4
Preset 5 Preset 6
Preset 7 Preset 8
Recall

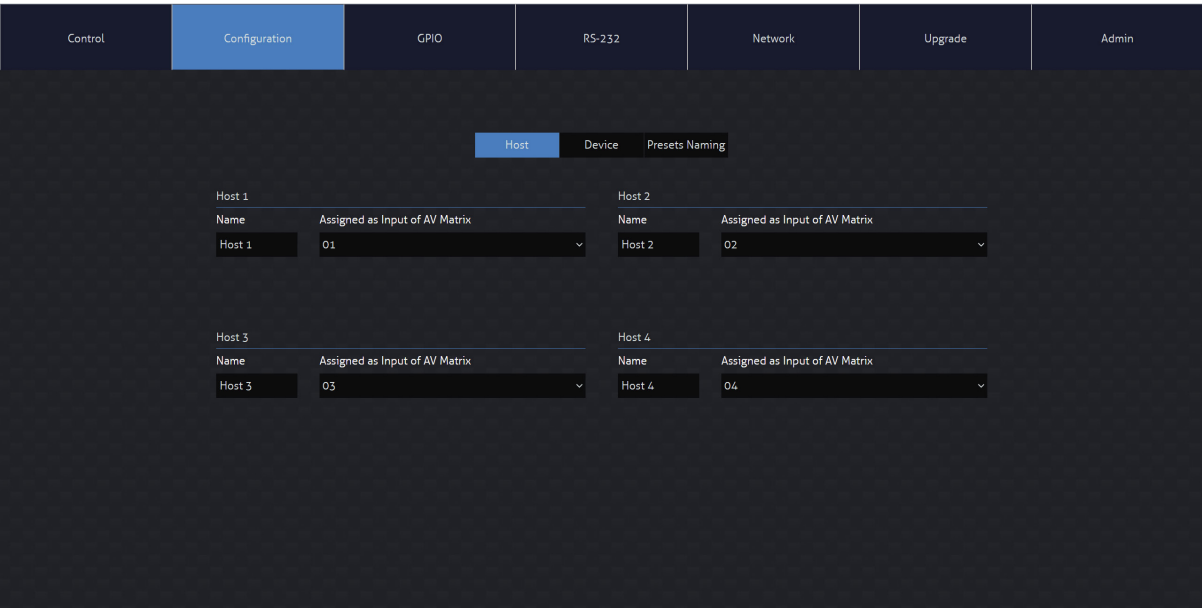
User Control Page

A logged in User, or Admin Control page allows a User to change inputs and/or presets for each Host. To change inputs, select the square that corresponds with the input and zone output needing to be changed. On the right, a preset can be recalled, or save the current input/output configuration into a specified preset slot. There is also a power button on the lower right corner to turn the Matrix on or off.



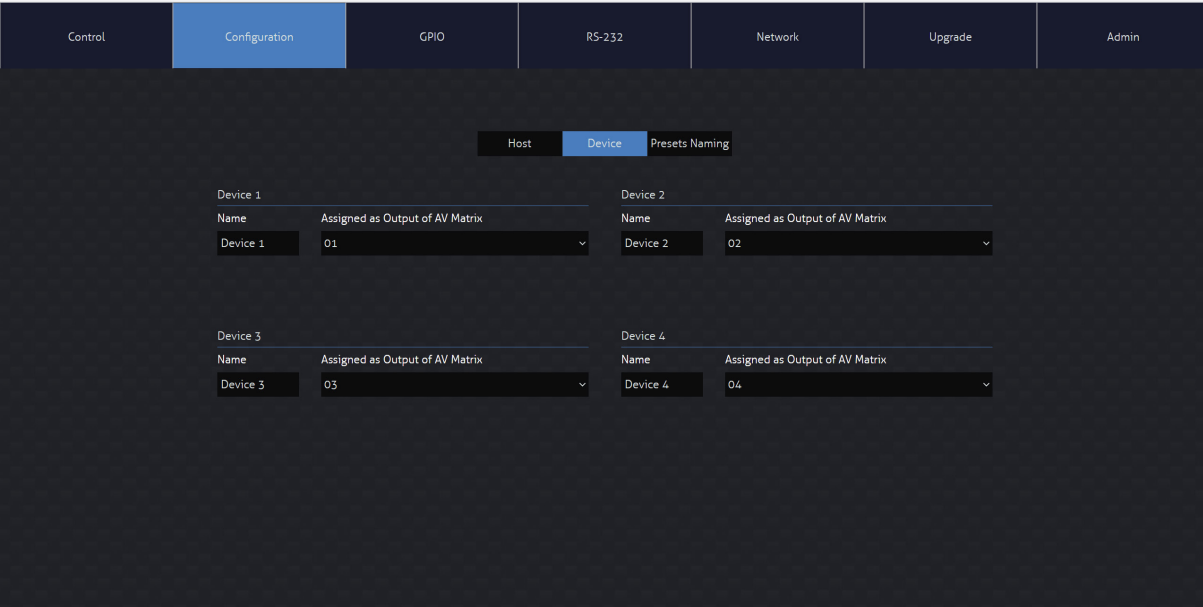
Host Configuration Page

The Host Configuration page allows each of the USB Host inputs to be assigned an ID associated with an input into a Blustream AV Matrix, as well as a name. This is particularly useful when being used in conjunction with a Blustream AV Matrix. The MX44KVM can be cascaded (for control via RS-232) with multiple MX44KVM units, with each USB Host assigned a specific ID number to switch with the associated inputs on additional MX44KVM, or when linked to AV Matrix products.



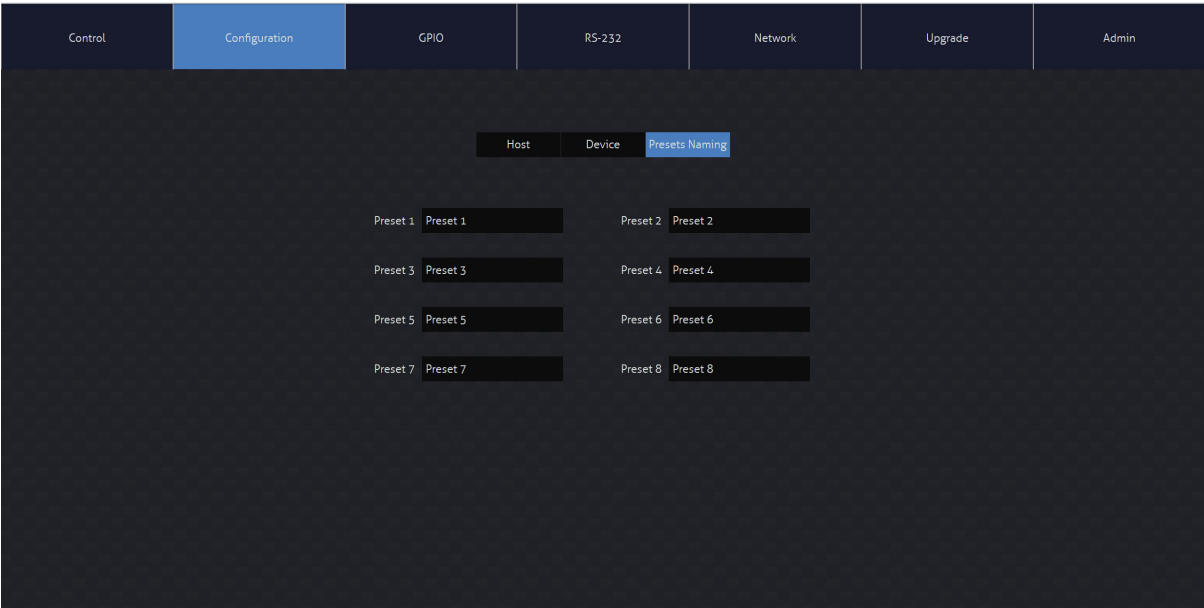
Device Configuration Page

The Device Configuration page allows each of the USB Device peripherals to be assigned an ID associated with an input into a Blustream AV Matrix, as well as a name. This is particularly useful when being used in conjunction with a Blustream AV Matrix. The MX44KVM can be cascaded with multiple MX44KVM units, with each USB Device assigned a specific ID number to switch with the associated output on additional MX44KVM, or AV Matrix products.



Preset Configuration Page

The Preset Configuration Page allows a User to change the naming of the presets on the Control Page of the Matrix for simpler navigation by additional users.



GPIO Page

The GPIO (General Purpose Input / Output) page allows for the configuration of the functionality of the GPIO ports on the MX44KVM.

Each of the MX44KVM's four I/O ports can be configured as either Inputs or Outputs, and have the following independent options available:

Input Triggers:

The MX44KVM can be triggered to carry out an action when a voltage is sensed from one of the GPIO's set to Input.

Trigger Conditions: Low Level (0-6V), or High Level (6-12V)

Trigger Event: Activate Standby, or Activate Auto Switching

Output Triggers:

The MX44KVM's outputs can be used as either a contact closure, or to output a 5V or 12V trigger for a set period of time.

Output type: 5V 50mA, 12V 50mA, or contact closure

Output duration: 1min to 60mins, or always on

Control Configuration **GPIO** RS-232 Network Upgrade Admin

Enable/Disable: ☒ On

I/O 1 Input
Trigger Condition: Low Level
Trigger Event: ☐ Standby ☐ Auto-switching

I/O 2 Input
Trigger Condition: Low Level
Trigger Event: ☐ Standby ☐ Auto-switching

I/O 3 Input
Trigger Condition: Low Level
Trigger Event: ☐ Standby ☐ Auto-switching

I/O 4 Output
5V 50mA 12V 50mA Contact Closure
☐ I/O Output Always On
Time(0-180s) Save

RS-232 Page

The RS-232 page allows for commands to be sent out of the local RS-232 port on the Matrix.

Baud rate and terminator command, as well as Hex or ASCII can be selected.

Sending an RS-232 command out via the Matrix can be useful in assisting with debugging and fault finding an RS-232 device connected to the Matrix.

The screenshot shows the RS-232 configuration page. At the top, there is a navigation bar with tabs: Control, Configuration, GPIO, RS-232 (selected), Network, Upgrade, and Admin. Below the navigation bar, there are two buttons: HEX and ASCII. The Baud Rate is set to 57600. The Command Ending is set to NULL. The Command field is empty. There are Send and Cancel buttons. A note at the bottom states: "This page allows you to configure RS232 port on the matrix and send out commands to the connected device."

Network Page

The Network page allows the ability to specify the TCP/IP network port settings. Static IP or DHCP, can be selected as well as specification of a fixed IP Address, Subnet Mask and Gateway. The Telnet port can also be adjusted for individual control systems as required.

The screenshot shows the Network configuration page. At the top, there is a navigation bar with tabs: Control, Configuration, GPIO, RS-232, Network (selected), Upgrade, and Admin. Below the navigation bar, there are two sections. The left section is for IP configuration, showing MAC Address: 34-D0-B8-23-00-13, DHCP (selected), Static IP, IP Address: 192.168.0.200, Subnet Mask: 255.255.255.0, and Gateway. The right section is for Telnet configuration, showing Telnet Access: On, Telnet Port: 23, and Port 8000: On. There is a Save button at the bottom.

Upgrade Page

The Upgrade page shows the current firmware versions on the Matrix, this includes the Web-GUI version and MCU firmware versions. The Matrix (MCU) firmware can be uploaded from this page as required. Please refer to the instructions within the files on the Blustream website prior to undertaking a firmware update. To update the firmware of the unit, download the relevant file from the Blustream website, browse for the firmware update file on your PC, and press Submit. Do not un-plug or turn off the updating PC during the update process.

The screenshot shows the 'Upgrade' tab selected in the top navigation bar. The main content area is dark blue and contains two sections: 'Device Information' and 'Upgrade Firmware'. The 'Device Information' section displays the following text: 'MX44KVM', 'GUI: V0.0a', and 'Firmware: V0.0a'. The 'Upgrade Firmware' section features a large black rectangular area for file selection, a 'Browse' button to its right, and a 'Submit' button centered below the file selection area.

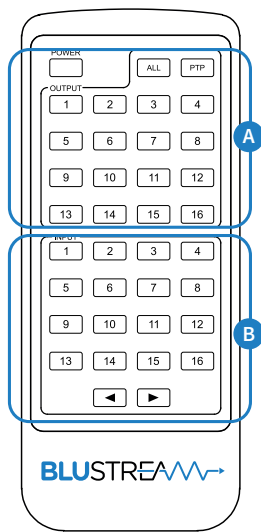
Admin Page

The Admin page allows the Admin user to configure up to 8x Users including a Guest user. Users have permission to update their own passwords as required, but can also be carried from this page by the Admin as required.

The Admin, or Users who have been given Admin permissions, are able to allocate permissions to Users. These permissions include allowing or disabling access to individual pages within the Web-GUI, as well as access to each input or output of the Matrix.

The Admin page also allows for the front panel buttons, and front panel IR control to be locked or unlocked. The Matrix can be factory defaulted by clicking the Reset button. This resets the matrix back to factory settings - this includes naming, users, permissions and network settings.

The screenshot shows the 'Admin' tab selected in the top navigation bar. The main content area is dark blue and contains several sections: 'Admin Credentials' with fields for Name (blustream), Current Password, New Password, and Confirm New Password; 'User Authorisation' with toggle switches for Guest (On) and Users 1 through 7 (all Off); 'User' selection with radio buttons for Guest, User 1 through 7; 'Host / Device Permissions' with checkboxes for Host (1, 2, 3, 4) and Device (1, 2, 3, 4), and a 'Preset' checkbox; and 'Main Features' with a 'Front Panel Lock' toggle (Off) and a red 'Reset' button. A note below the Reset button states: 'Reset all settings of the unit including network and general settings.' A 'Save' button is located at the bottom center of the page.



- A** Select the zone Output you wish to change the source on (Numbers 1-16 correspond to the zone outputs 1-16, or All corresponds with all outputs).
Pressing the PTP button will mirror all inputs and outputs (Example - Input 1 to output 1, input 2 to output 2 etc).
- B** Select the source Input you wish to change the selected zone to (numbers 1-8 correspond to the source inputs 1-8m or All corresponds with all inputs)

Advanced matrix features are not available via IR commands

[illegible]

Specifications

- **USB Device Connectors:** 4 x USB Type A, female
- **USB Host Connectors:** 4 x USB Type B, female
- **RS-232 Serial Port:** 2 x 3-pin Phoenix connector
- **IR Input Ports:** 1 x 3.5mm stereo jack
- **TCP/IP Control Port:** 1 x RJ45, female
- **GPIO Port:** 1 x 5-pin Phoenix connector
- **Casing Dimensions (W x H x D):** 273mm x 168mm x 25mm
- **Shipping Weight:** 0.8kg **(TBC)**
- **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:** 24V/1.25A DC, 4-pin DIN connector

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

Package Contents

- 1 x MX44KVM
- 1 x Mounting kit
- 1 x USB-A to USB-B cable
- 1 x IRR receiver
- 1 x IRCAB control cable - 3.5mm-3.5mm cable
- 2 x 3-pin Phoenix connector
- 1 x 5-pin Phoenix connector
- 1 x 24V/1.25A DC power supply
- 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.

RS-232 Configuration and Telnet Commands

The Blustream matrix can be controlled via serial and TCP/IP.

RS-232 port 1 is used for configuration and control of the product. RS-232 port 2 is used for cascading multiple MX44KVM units together to create a larger I/O KVM matrix system, or when used in conjunction with a Bustream AV matrix to add KVM switching to a larger system.

The default RS-232 communication settings for both ports are:

Baud rate: 57600

Data bit: 8

Stop bit: 1

Parity bit: none

The following pages list all available serial commands for RS-232 port 1:

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
USBOUTxxFRyy	(xx is the Host / zone out, yy is the USB Device input)
Example:-	USBOUT01FR04 (This would switch host 1 to device 4)

Common Mistakes

- Carriage return – Some programs do not require the carriage return, where others will not work unless included after / within 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 USBOUT01FR02
 - How the string may look if spaces are required: USBOUT{Space}01{Space}FR{Space}02
- Baud rate or other serial protocol settings are not correct

RS-232 Configuration and Telnet Commands

COMMAND	ACTION
STATUS	Print System Status And Port Status
INSTA	Print All Input Status
OUTSTA	Print All Output Status
PRESETSTATUS	Print All Preset Configurations
GPIOSTATUS	Print All GPIO Status
CASCADESTATUS	Print All Cascade Status
PON/OFF	Set System Power On Or Off
IR ON/OFF	Set System IR Control On Or Off
KEY ON/OFF	Set System Key Control On Or Off
RESET	Reset System To Default Setting (Type 'Yes' To Confirm, Or Send Other Command To Discard)
USBOUT xx FR yy	Set USB Host From Device:yy xx = [01-04] : USB Host 1 - 4 yy = [01-04] : USB Device 1 - 4 yy = 00 : All USB Device
DEVICESW xx	Set The Shutdown Time Of Device After USB Switchover To xx (/100ms) xx = [02-20] : Device Off Time To 200ms - 2000ms
DEVICE xx ON/OFF	Set Disable USB Device Data Connection xx = 0 : All Devices xx = [01-04] : Device 1 - 4
DEVICE xx PON/POFF Set Disable USB Device Power	xx = 0 : All Devices xx = [01-04] : Device 1 - 4
PRESET pp SAVE	Save Current Output Connections To Preset pp Config pp = [01-09] : Preset 1 - 9
PRESET pp CLR	Delete Preset pp Config pp = [00-09] : 00 : All Presets, pp = [01-09] : Preset 1 - 9
PRESET pp APPLY	Apply Preset pp Config To Output Connection pp = [01-09] : Preset 1 - 9
GPIOENABLE x	Set GPIO Enable/Disable x = [0-1] 0 : Disable, 1 : Enable
HOST xx FR yy	Set The Relationship Between MX44KVM Output And AV Input xx = [01-04] : USB Host 1 - 4 yy = 00 : Off yy = [01-16] : AV Input 1 - 16
DEVICE xx OUT yy	Set The Relationship Between MX44KVM Input And AV Output xx = [01-04] : USB Device 1 - 4 yy = 00 : Off yy = [01-16] : AV Output 1 - 16
OUTPIN xx MODE yy	TIME zzzz Set GPIO xx Output Mode To yy Trigger Time zzzz xx = 00 : All GPIO xx = [01-04] : GPIO 1 - 4 y = 00 : Close Output Mode yy = [01-03] : Mode 1 - 3 (1: output 5v 50mA, 2: output 12v 50mA, 3: Contact Closure) zzzz = [0005-1800] : time 0.5s - 180s

COMMAND	ACTION
INPIN xx MODE yy SN z	Set GPIO xx Input Mode To yy Trigger Level z xx = 00 : All GPIO xx = [01-04] : GPIO 1 - 4 yy = [00-02] : Mode 0 - 2 (0-Turn Off All Detection Modes, 1-Turn On Standby Mode Detection, 2-Turn On Auto Switching Mode Detection) z = [0-1] : SN 0 - 1 (Trigger Level: 0 - Low Level Valid, 1 - High Level Valid)
RS232PASSFEED ON/OFF	Set RS232-2 Feedback On Or Off
AUTOSWITCHING ON/OFF	Set Auto Switching Mode On Or Off
RS232PASS xx	Set The RS232 Transparent Transmission Mode xx = 01 : Local Control Of MX44KVM & Passthrough To Rs-232 Port 2 xx = 02 : Local Control Of MX44KVM Only xx = 03 : Passthrough To RS-232 Port 2 Only
RS232BAUD z	Set RS232-1 & RS232-2 Baud Rate To xx z = 1 - 2400, 2 - 4800, 3 - 9600, 4 - 19200, 5 - 38400, 6 - 57600 (Default), 7 - 115200
RS232ONOUT a:b:c:d	"Send The RS232 Command d To Port a At Baud Rate c And Format b a = 1 - RS232-1, 2 - RS232-2 b = a ASCII, h HEX c = 1 - 2400, 2 - 4800, 3 - 9600, 4 - 19200, 5 - 38400, 6 - 57600 (Default), 7 - 115200 d = RS232 Command"
NET DHCP ON/OFF	Set Auto IP(DHCP) On Or Off
NET MDNS ON/OFF	Set mDNS 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 RB	Set Network Reboot And Apply New Config!!!
NET TN xxxx	Set Telnet Port
NET TN ON/OFF	Set Telnet Port On Or Off
NET TN8000 ON/OFF	Set Telnet Port 8000 On Or Off

Web-GUI Firmware Update

The Web-GUI of the Matrix is used to configure and control the product through a web portal. The Matrix can be accessed on any internet connected device including: tablets, smart phones and laptops that are on the same network.

As the Web-GUI is used to update the main matrix firmware it is important to ensure that the Web-GUI firmware is the latest version **PRIOR** to updating the main MCU firmware. Please check the current firmware version against the version available to download from the Blustream website.

To update the Web-GUI firmware:

1) Login to the Web-GUI update menu:

Default IP Address: 192.168.0.200:100

Default Username: [blustream](#)

Default Password: [1234](#) or [@Bls1234](#)

Please note: the IP address may differ if default network settings have been updated. If this is the case, please replace the following with the products current IP address:

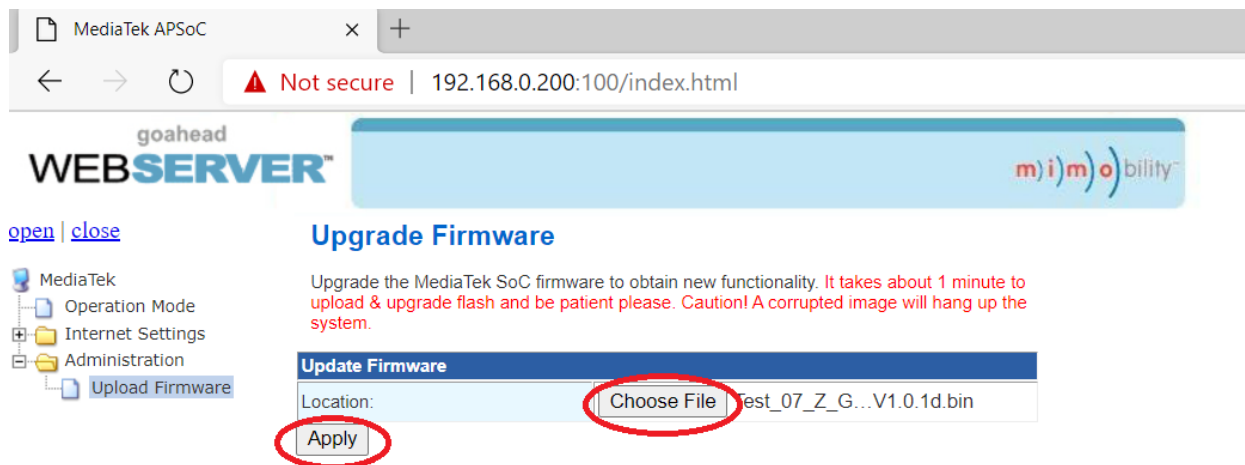
[XXX.XXX.XXX.XXX:100](#)

2) When the Web-GUI menu interface has been accessed, expand the 'Administration' file in the menu tree by clicking the small '+' icon next to the file.

3) Select 'Upload Firmware':

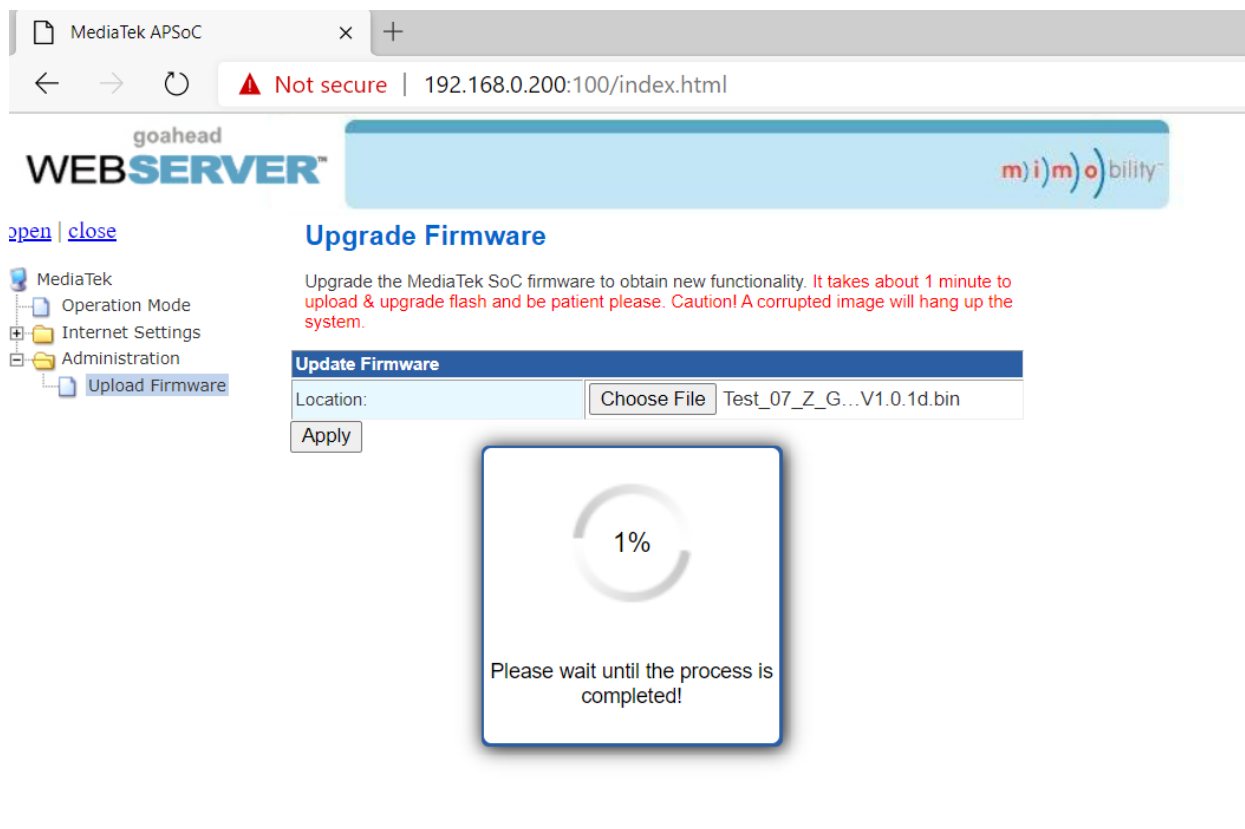


4) Click 'Choose File' and select the Web-GUI/MediaTek firmware file downloaded in advance from the Blustream website. This will be a .bin file:

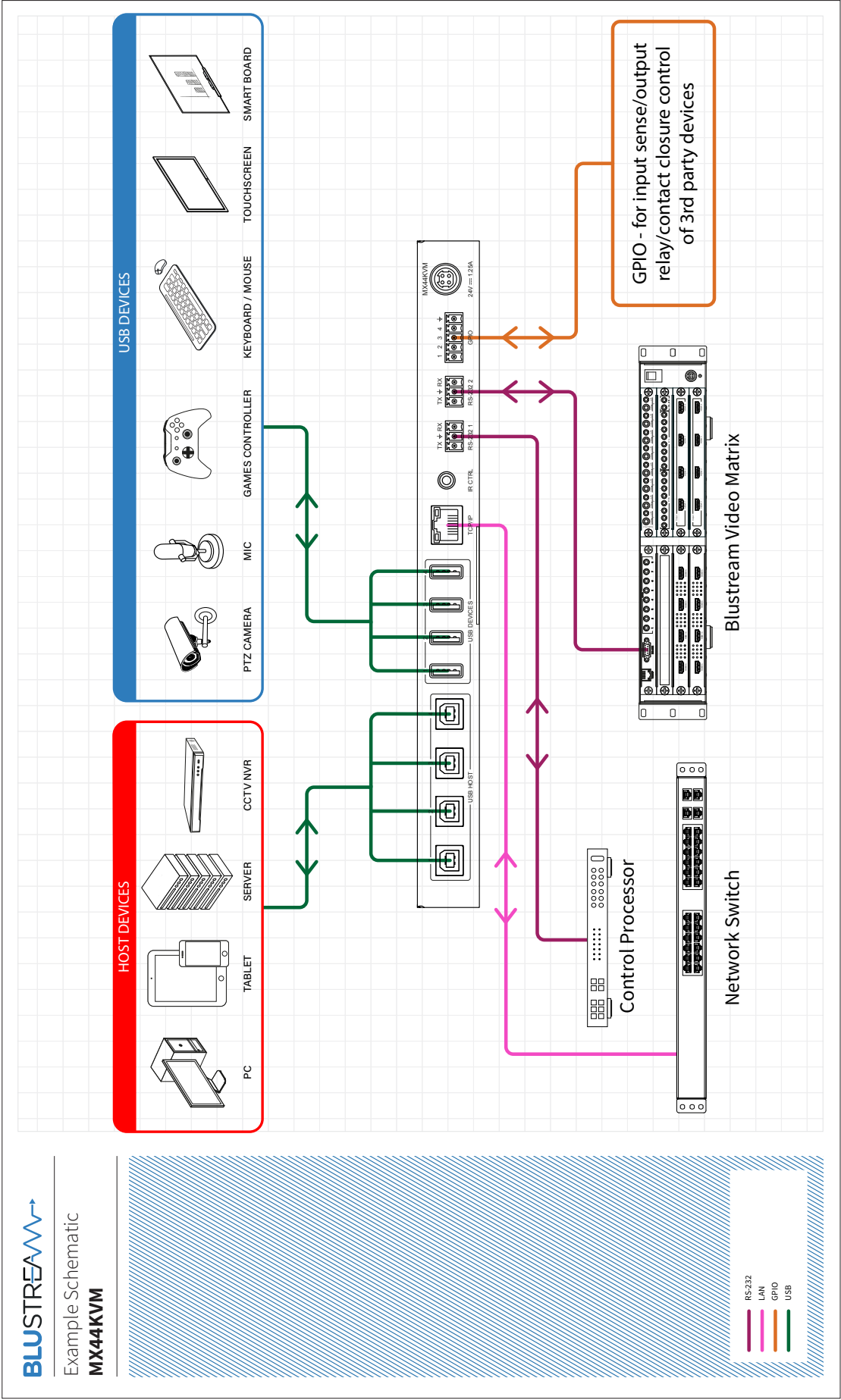


5) Press 'Apply' to begin the firmware update process.

The update process will take up to 1 minute to complete. Do not refresh or navigate away from this page, or disconnect the matrix from the PC until the update process has completed.



Example Schematic



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.





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