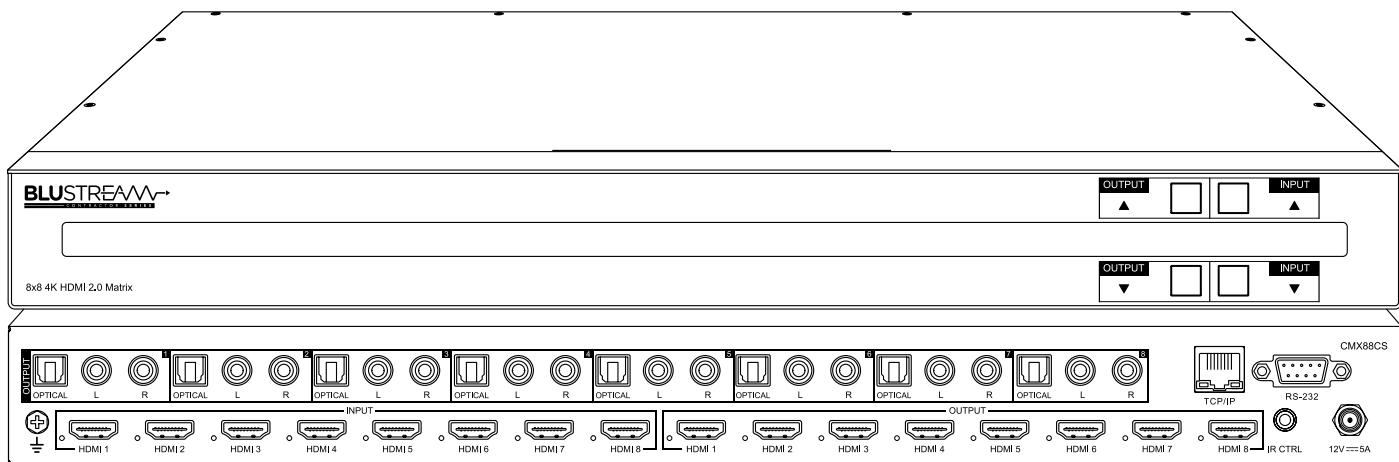




► CMX88CS User Manual

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 Contractor CMX88CS 4K HDMI Matrix offers unprecedented performance and value for the custom installation market.

The CMX88CS supports HDMI 2.0 with HDCP 2.2, allowing distribution of eight HDMI sources to eight displays. This enables all sources to be viewed as required within a matrix configuration.

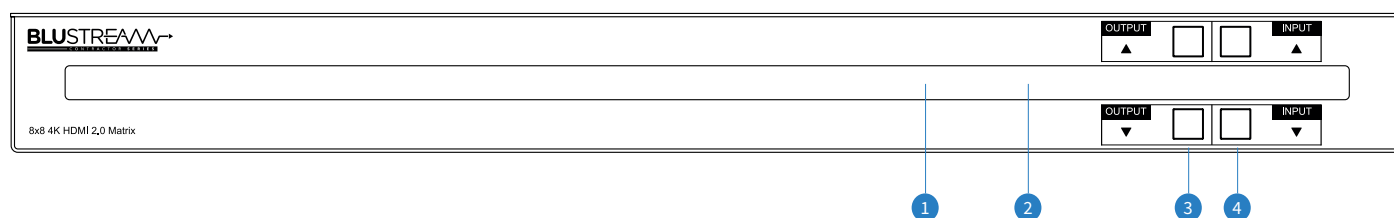
The unit transmits all HDMI resolutions up to and including 4K 60Hz 4:4:4. The 8-Way matrix also includes audio breakout, EDID management and a web browser interface module for control and configuration of the matrix.

FEATURES:

- Features 8x HDMI inputs which can be independently routed to 8x HDMI outputs
- Supports 4K UHD video including HDR (up to 4K @60Hz 4:4:4)
- Independent video down conversion on all HDMI outputs allowing a display only capable of supporting lower 4K video resolutions (4K 60Hz 4:2:0) to receive 4K 60Hz 4:4:4 video content while still showing maximum original 4K UHD resolution on remaining outputs
- Supports all industry standard video resolutions including VGA-WUXGA and 480i-4K
- Supports all known HDMI audio formats including Dolby TrueHD, Dolby Atmos, Dolby Digital Plus and DTS-HD Master Audio transmission
- HDMI audio breakout to associated output analogue L/R audio and optical digital outputs concurrently
- Web interface module for control and configuration of the Matrix
- Control via front panel, IR, RS-232 & TCP/IP
- 3rd party drivers available for major home control brands
- Advanced EDID management
- HDCP 2.2 compliant

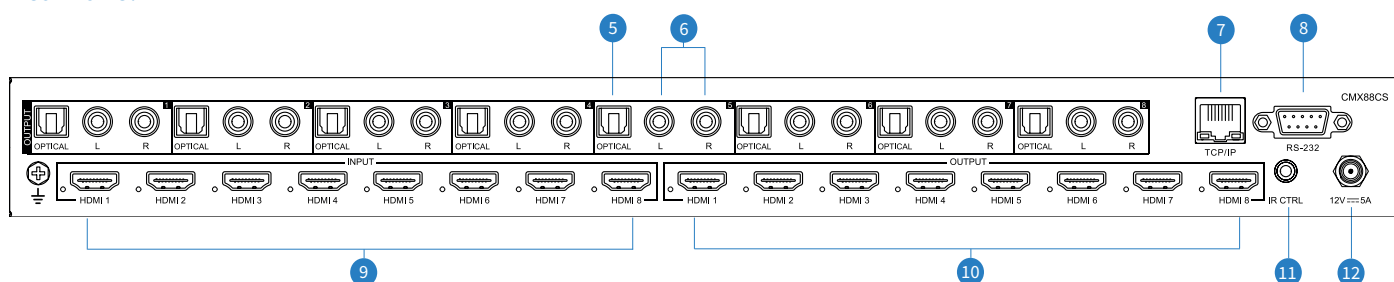
CMX88CS Panel Descriptions

Front Panel



- 1 IR receiver window for Matrix control
 - 2 LED indicator - Will flash when IR commands are received
 - 3 HDMI output selection buttons UP/DOWN. Press to scroll through HDMI outputs 1-8 (A = all outputs)
 - 4 HDMI input selection buttons UP/DOWN. Press to scroll through HDMI inputs 1-8
- To lock the front panel buttons, press and hold the 'Input Down' button for 10 seconds. Repeat this process to unlock the front panel buttons. The key lock can also be toggled using an API command - see commands later in this guide.
 - To power toggle the unit, press and hold the 'Input Up' button for 5 seconds/
 - To factory reset the matrix from the front panel, press and hold the 'Output Up' button for 5 seconds.

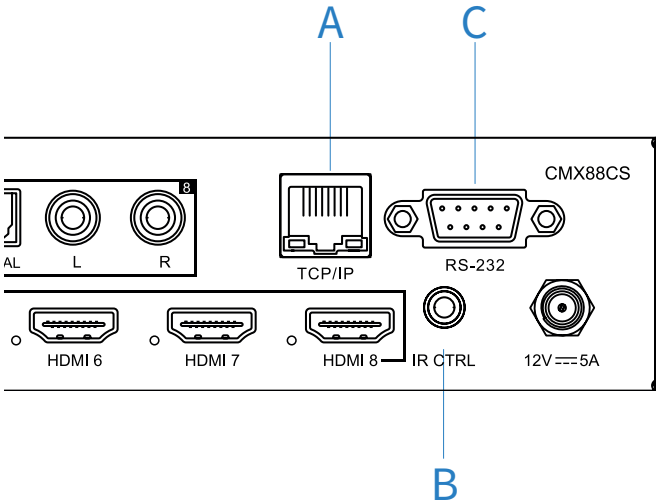
Rear Panel



- 5 Optical digital audio output - Toslink (S/PDIF)
- 6 Analogue L/R audio output - Supports 2 channel PCM only. The Matrix does not down-mix multi-channel audio signals.
- 7 TCP/IP connection - Connect to local network. Default network setting is DHCP.
Note: If Matrix is not connected to a router, the default IP address is 192.168.0.200
- 8 RS-232 serial port - For control of switcher by third party control devices
- 9 HDMI inputs - connect to HDMI source devices
- 10 HDMI outputs - connect to HDMI display devices
- 11 IR control - IR input for Matrix control. Connect 5V Blustream IR receiver.
- 12 Power port - Use included 12V/5A DC power adaptor

CMX88CS Control Ports

The CMX88CS main communication ports are located on the rear panel and includes the following connections:



Connections:

- A. TCP/IP – For control of the Matrix (RJ45 Connector)
- B. Global IR Input 3.5mm stereo jack - For control of the Matrix Switcher*
- C. RS-232 – For control of the Matrix (9 pin serial connection)

*Note - Blustream products use 5V IR hardware. For further details please see page 6 'Infrared Control'.
Blustream’s CMX88CS Matrix is supplied with the required 5V IR Receiver cabling.

TCP/IP

The Blustream CMX88CS Matrix can be controlled via TCP/IP.
For the full list of protocols please see CMX88CS control pages located at the rear of this manual.
The CMX88CS Matrix features a built-in web browser user interface allowing control and configuration of the matrix. 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 below details:

Default IP Address is: 192.168.0.200
Default Username is: blustream
Default Password is: @BlS1234

RS-232 2-Way

The Blustream CMX88CS Matrix can be controlled via a 9-pin serial cable.
For the full list of protocols please see ‘CMX88CS Control Protocols’ located at the rear of this manual.
Details of RS-232 pin assignment and communication are adjacent. Please note that depending on your control device serial port pin configuration you may require either a ‘Straight’ RS-232 cable or ‘Null-modem’ type.

BLUSTREAM RS-232		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
8	NC	8	NC
9	NC	9	NC

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

Front Panel Control

The front panel buttons are used to individually amend the input / output structure of the matrix. Using the Output UP / DOWN buttons, first select the desired output, then using the Input UP / DOWN buttons, select the source device to switch to. Clicking the Input UP / DOWN buttons scrolls through the INPUT / OUTPUT numbers sequentially from 1 - 8 then back to 1.

The Output UP / DOWN buttons scroll from 1 - 8 then 'A' for ALL, before returning to output 1. Selecting 'A': will switch all outputs to the selected Input.

The front panel buttons can be used for other control features:

- INPUT UP - Press and hold for 3 seconds to power off the Matrix (press to power on when in standby mode)
- INPUT DOWN - Press and hold for 10 seconds to turn on/off front panel button lock
- OUTPUT UP - Press and hold for 3 seconds to set PTP mode (output 1 = input 1, output 2 = input 2 etc)

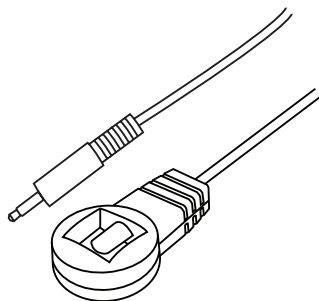
Infrared (IR) Control

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

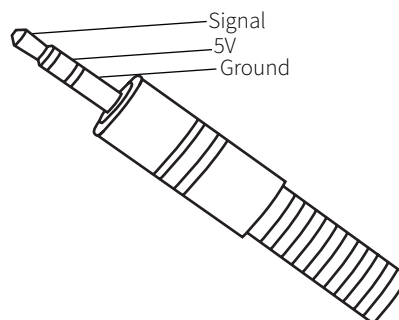
IMPORTANT: Blustream Infrared products are all 5V and NOT compatible with alternative manufacturers Infrared solutions. When using third party 12V IR control solutions please use the Blustream IRCAB cable for IR conversion (sold separately).

IR Receiver - IRR

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



IR Receiver - Stereo 3.5mm

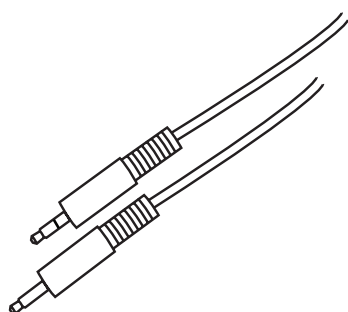


IR Control Cable - IRCAB (supplied separately)

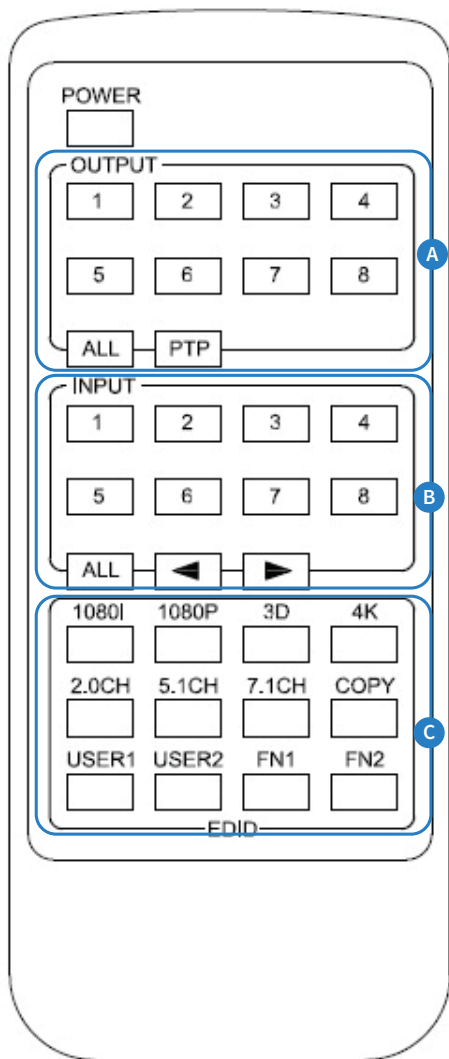
Blustream IR Control cable 3.5mm Mono to 3.5mm Stereo for linking third party control solutions to Blustream products.

Compatible with 12V IR third party products.

Please note: Cable is directional as indicated



Remote Control Description



OUTPUT AND INPUT SELECTION

- A** Select the zone OUTPUT you wish to change the source on (numbers 1-8 correspond to the zone outputs 1-8).
- B** Select the source INPUT you wish to change on the selected zone to (numbers 1-8 correspond to the source inputs 1-8)
- C** Press PTP button If you wish to instantly mirror all inputs and outputs (example - input 1 to output 1, input 2 to output 2 etc).

EDID Configuration

Fixed EDID to INPUT / ALL INPUTS:

To select video resolution - Press **1080i/1080p/3D/4K**

To select Audio resolution - Press **2.0CH/5.1CH/7.1CH**

To assign settings to individual input/all inputs – Press **INPUT/ALL** button in 'ZONE INPUT' area of remote control

Copy EDID of any specific OUTPUT to any assigned INPUT or ALL INPUTS:

Press **COPY** button

Press **OUTPUT** zone button you wish to copy EDID from

Press **INPUT** zone button /ALL button to copy EDID to

User defined EDID to any INPUT or ALL INPUTS:

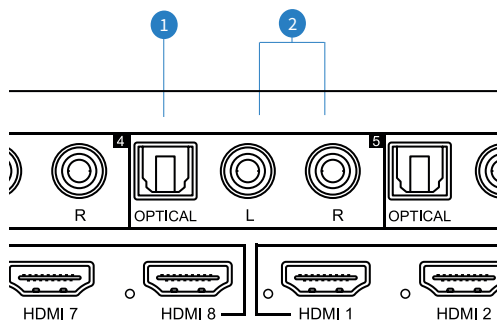
Press **USER1/USER2** button

Press selected **INPUT** or **ALL** button to assign EDID

PLEASE NOTE: THE BUTTON PRESS SEQUENCE SHOULD BE FINISHED WITHIN 3 SECONDS, OTHERWISE THE OPERATION IS DISCARDED

Audio Breakout

The CMX88CS Matrix includes audio breakout from the selected HDMI zone output to associated analogue L/R audio and optical digital outputs. Extracted audio will be concurrent with the corresponding HDMI video output.



1. Coaxial digital output - Output 5
2. Analogue pre-amp line level output 3.5mm stereo jack - Output 5

Please note: The CMX88CS matrix does not down-mix multi-channel digital audio signals

Automatic Video Resolution Conversion

The CMX88CS features an automatic video resolution down-conversion tool allowing for the matrix to convert the chroma subsample of the native video source signal to a lower format of the same resolution.

Where the matrix is fed with a source signal that is (for instance) 4K 60Hz 4:4:4 but any screen connected to any of the 8 HDMI outputs cannot accept this native chroma subsample, the matrix will automatically convert the signal to 4K 60Hz 4:2:0.

Please note: The CMX88CS matrix cannot automatically down-convert a 4:2:2 chroma subsample.

Adjusting EDID Settings

The EDID configuration of the CMX88AB can be altered per input by using the Web-GUI of the Matrix, using serial commands per the API details towards the rear of this manual, or using the supplied remote control (details above).

Please note: The 4K auto down-conversion feature will read the EDID from the display and output a suitable 4K video resolution. The EDID handshake will not know if the method of HDMI signal distribution between Matrix and display is capable of supporting all 4K resolutions. It may be necessary to use EDID management to lower the source resolution to support the method of signal distribution required, especially if the displays being used are only capable of 1080p (or lower) support.



Example Schematic

-

Specifications

Video Input Connectors: 8x HDMI Type A, 19-pin, female

Video Output Connectors: 8x HDMI Type A, 19-pin, female

Audio Output Connectors: 8x Optical (S/PDIF), 8x RCA Phono (L/R)

RS-232 Serial Port: 1x DB9 connector (control)

TCP/IP Control: 1x RJ45, female

IR Input Port: 1x 3.5mm stereo jack

Dimensions (W x H x D) including connections / feet: 441mm x 226mm x 50mm

Case Dimensions (W x H x D): 441mm x 234mm x 45mm

Shipping Weight: 3.5kg

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: 1x 12V / 5A DC

Please note: Specifications are subject to change without notice.

Package Contents:

- 1 x CMX88CS Matrix
- 1 x 19" Rack mounting kit for CMX88AB Matrix
- 1 x 12V 5A power supply (PS125)
- 1 x Remote control
- 1 x IRR Blustream 5V IR receiver
- 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 and Telnet Commands

The Blustream CMX88CS can be controlled via serial and TCP/IP. The following pages list all available serial commands for the CMX88CS Matrix. Details of RS-232 pin assignment can be found on page 05.

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 Page 5 for Matrix settings

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
DBG ON/OFF	Set Debug Mode On Or Off
BEEPON/OFF	Set Onboard Beep On Or Off
RESET	Reset System To Default Setting (Should Type “Yes” To Confirm, “No” To Discard)
OUTxxON/OFF	Set OUTPUT:xx On Or Off
OUTxxFRyy	Set OUTPUT:xx From INPUT:yy
EDIDxxCPyy	Copy EDID from output (yy) to input (xx) Both yy & xx can be set individually (01-08) or as ALL (00)

RS-232 and Telnet Commands (continued)

RS232 Command	Description
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 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
RESETDEF	Restore factory settings

8x8 Matrix IR Database (continued)

[illegible]

8x8 Matrix IR Database (continued)

3D	0F	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 003F 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 003F 0016 003F 0016 0689
4K	51	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 003F 0016 0016 0016 003F 0016 0689
2.0CH	0A	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 003F 0016 003F 0016 003F 0016 003F 0016 0689
5.1CH	1E	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 0016 0016 003F 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 003F 0016 0689
7.1CH	0E	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 0016 0016 0016 0016 003F 0016 003F 0016 003F 0016 003F 0016 0689
COPY	1A	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 0016 0016 003F 0016 003F 0016 003F 0016 0689
USER 1	53	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 003F 0016 003F 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 003F 0016 0016 0016 003F 0016 0689
USER 2	52	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 0016 003F 0016 0016 0016 003F 0016 0689
USER 3	01	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 003F 003F 0016 003F 0016 003F 0016 003F 0016 0689
USER 4	45	0000 006D 0000 0022 0157 00AC 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 003F 0016 003F 0016 0016 0016 0016 0016 0016 0016 0016 0016 003F 0016 0016 0016 0016 0016 003F 0016 0016 0016 003F 0016 003F 0016 0016 0016 003F 0016 0689

Blustream Web Browser Interface

The Blustream CMX88CS matrix unit can be both controlled and configured using the in-built web-server.

The CMX88CS Matrix must be connected to an active network router/switch and it is advised that the Matrix is given a static IP address. You can configure the network settings of the Matrix using the Web Browser Interface (Blustream Matrix products are shipped with the network set to DHCP).

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.

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.

Notes:



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