

EL-4KM-V88

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

The transmission distances of HDMI over UTP cables are measured using TE CONNECTIVITY 1427071-6

EIA/TIA-568-B termination (T568B) of cables is recommended for optimal performance.

To minimize interference of the unshielded twisted pairs in the CAT5e/6 cable do not run the HDBaseT/Cat5e/6/6a cabling with or in close parallel proximity to mains power cables.

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

Do not disassemble either the Transmitter or Receiver units for any reason. Doing so will void the manufacturer's warranty.

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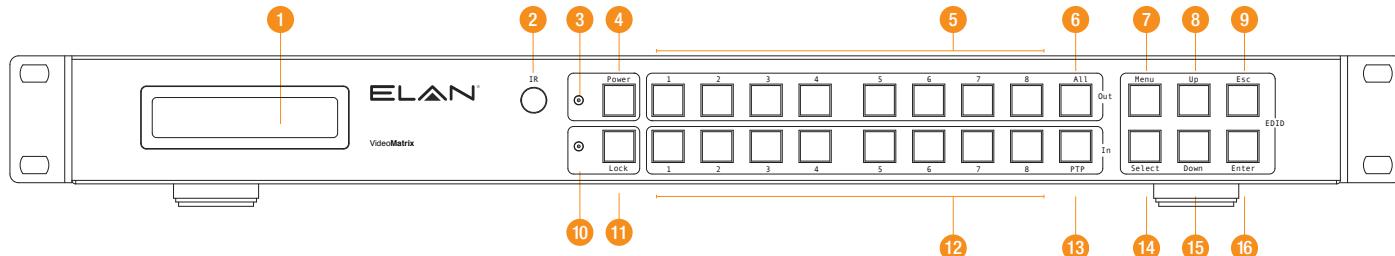
Introduction

The ELAN 8x8 HDBaseT™ Matrix offers unprecedented performance and value for the custom installation market. The EL-4KM-V88 is a 4K HDCP 2.2 8x8 matrix with a combination of 6 x HDBaseT™ and 2 x HDMI outputs. This allows for cost-effective integration of local displays or AV receivers within an installation. The Matrix delivers HDMI, Bi-directional IR and PoH (PoE) up to lengths of 40m at 4K (70m @1080p) over a single CAT cable. The EL-4KM-V88 Matrix features a web browser interface for control and configuration and is seamlessly integrated into ELAN control systems.

Features:

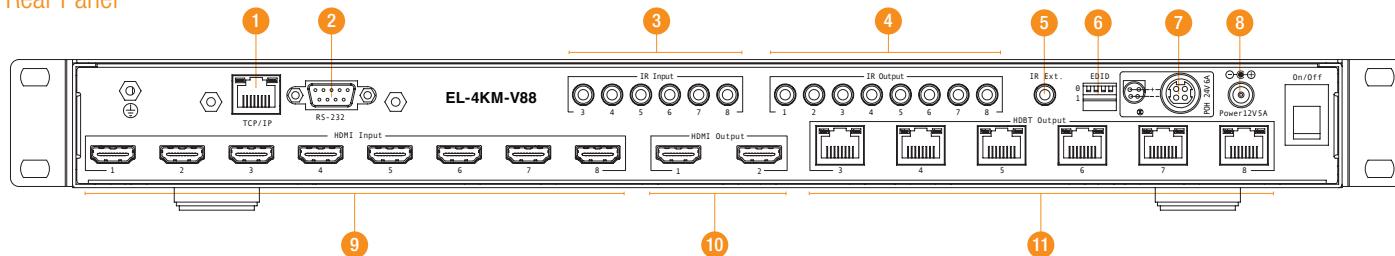
- Features 8x HDMI inputs which can be independently routed to 6x HDBaseT™ outputs and 2x independent HDMI outputs
- Extends HDMI up to a distance of 70m 1080P over single CAT cable
- Supports 4K UHD video up to 40m (3840 x 2160 @30Hz 4:4:4, 4096 x 2160 @24Hz 4:4:4, and 4K @60Hz 4:2:0)
- Supports all industry standard video resolutions including VGA-WUXGA and 480i-4K
- Supports 3D signal display
- Supports all known HDMI audio formats including Dolby TrueHD, Dolby Atmos, Dolby Digital Plus and DTS-HD Master Audio transmission
- Supports bi-directional IR on all HDBaseT outputs
- Web browser interface for control and configuration of Matrix
- Control via front panel, IR, RS-232, and TCP/IP
- Supports PoH (Power over HDBaseT™) to power compatible HDBaseT™ receivers
- Advanced EDID management
- HDCP 2.2 compliant
- 1U Design for 19" rack mount integration - mounting kit included

Front Panel



- | | | |
|---|---|---|
| <p>1 LCD display – Shows the status of input-output selection, menu and EDID info.</p> <p>2 IR receiver window – Receives IR from a hand held remote control or processor.</p> <p>3 Power LED indicator – Indicates the power status of the matrix.</p> <p>4 Power button – Press to toggle the power of the matrix on/off.</p> <p>5 HDMI output selection button 1 to 8 – Press to select the output from 1 to 8.</p> <p>6 All button for HDMI outputs – Press to select all of the outputs from 1 to 8.</p> | <p>7 Menu button – Press to enter EDID setup mode. Three EDID segments will display on the LCD panel listed as: INPUT, VIDEO and AUDIO, for example: IN1 1080P 2.0CH, means to set 1080P 2.0CH EDID to INPUT1. The blinking segment is the adjustable parameter.</p> <p>8 Up – Press to change up through the adjustable values.</p> <p>9 ESC – Press to quit EDID setup menu.</p> <p>q Lock LED indicator – Indicate the status of the key lock.</p> <p>w Lock button – Press to lock the buttons on the front panel.</p> | <p>e HDMI input selection button 1 to 8 – Press to select the input from 1 to 8.</p> <p>r PTP – Press to mirror all inputs and outputs (e.g. output 1 to input 1, output 2 to input 2 and so on).</p> <p>t Select – Press to select an EDID parameter to change. Selected segment will blink.</p> <p>y Down – Press to change down through the adjustable values.</p> <p>u Enter – Press to set EDID to specified INPUT or copy EDID from specified OUTPUT to specified INPUT.</p> |
|---|---|---|

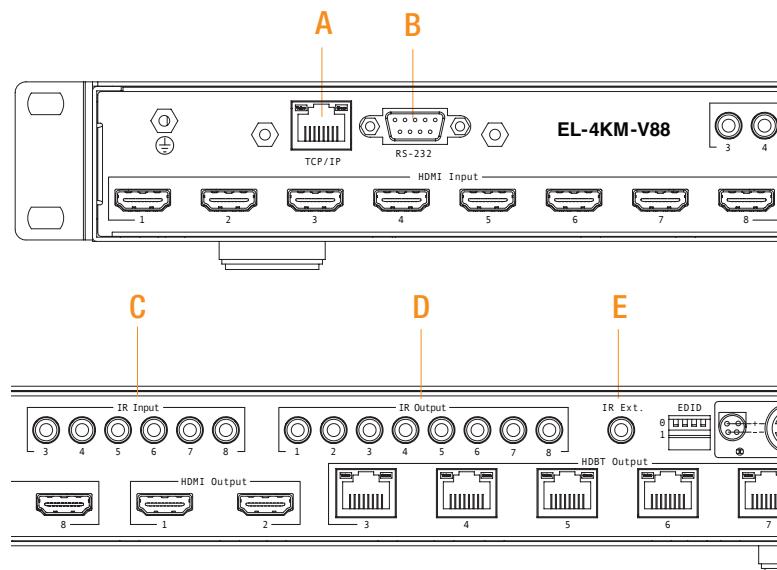
Rear Panel



- | | | |
|---|---|---|
| <p>1 RJ45 – TCP/IP control (Connect to LAN)</p> <p>2 RS-232 port – Connect to this port for the control of the matrix from a computer or control processor.</p> <p>3 IR inputs – 3.5mm stereo jack. Transmits IR to the zone HDBaseT receiver (displays). When using the IRCAB cable (supplied) ensure cable direction is correct.</p> | <p>4 IR outputs – 3.5mm mono jack – Routed IR from HDBaseT extender (zone output).</p> <p>5 IR input for matrix control – For hard wired IR connection. Connect to ELAN control processor.</p> <p>6 EDID DIP switch – Used for global EDID settings</p> <p>7 POH power port – Use included 24V/6A DC adaptor to power the remote HDBaseT receivers.</p> | <p>8 Power port – Use included 12V/5A DC adaptor to power the matrix switcher.</p> <p>9 HDMI inputs 1 to 8 – Connect HDMI sources.</p> <p>q HDMI outputs 1 to 2 – Output for displays.</p> <p>w HDBaseT outputs 3 to 8 – Output for displays.</p> |
|---|---|---|

EL-4KM-V88 Control Ports

The EL-4KM-V88 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. RS-232 – For control of the Matrix (9 pin serial connection).
- C. IR Input (3.5mm stereo jack) for IR pass-through to associated output HDBaseT Receiver*.
- D. IR Output (3.5mm mono jack) for routed IR control of source equipment*.
- E. Global IR Input 3.5mm stereo jack - For controlling the Matrix Switcher*.

There is no IR routing for outputs 1 & 2 on the EL-4KM-V88 Matrix as these are HDMI outputs only and designed for connection to local displays/hardware.

TCP/IP

The ELAN EL-4KM-V88 can be controlled via TCP/IP.

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

The EL-4KM-V88 features a built-in web browser user interface allowing control and configuration of the matrix. For further details please see page 19 'Web Browser User Interface'.

A 'Straight-through' RJ45 patch lead should be used.

RS-232 2-Way

The ELAN EL-4KM-V88 can be controlled via a 9-pin serial cable.

For full list of protocols please see 'RS-232 & Telenet Commands' 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.

ELAN 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

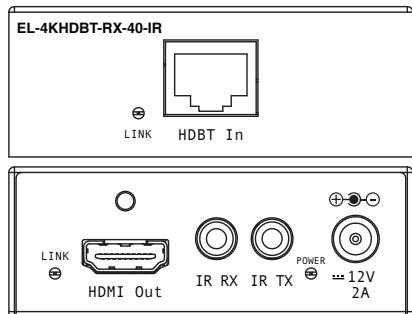
Flow Control: None

EL-4KM-V88 HDBaseT Receiver Options

There are two HDBaseT receiver options that are recommended to be used with the HDBaseT outputs on the EL-4KM-V88:-

EL-4KHDBT-RX-40-IR

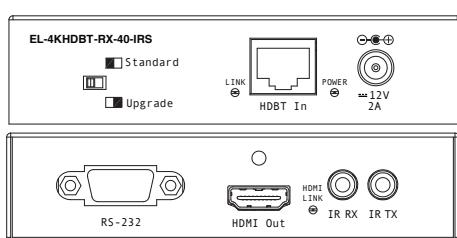
Basic HDBaseT Receiver with 2-way IR pass-through. Supports display distances up to 70m @ 1080P and 40M 4K (30Hz 4:4:4 & 60Hz 4:2:0).



- HDBaseT input/HDMI output
- IR Output 3.5mm mono jack
- IR Input 3.5mm stereo jack

EL-4KHDBT-RX-40-IRS

Mid-Level HDBaseT receiver which has the same features as the EL-4KHDBT-RX-70-ARC receiver but with added 2-way RS-232 control.



- HDBaseT input/HDMI output
- 2-way RS-232 (9-pin serial) - NOTE: EL-4KM-V88 does not support RS-232
- IR Output 3.5mm mono jack
- IR Input 3.5mm stereo jack

* **Note** - Other HDBaseT receivers will work with the HDBaseT outputs of the ELAN EL-4KM-V88 but some features of these receivers may not be supported by the Matrix.

Matrix Front Panel Control

Front Panel Display - Input/Output selection

The following display shows current source input selection per zone output.

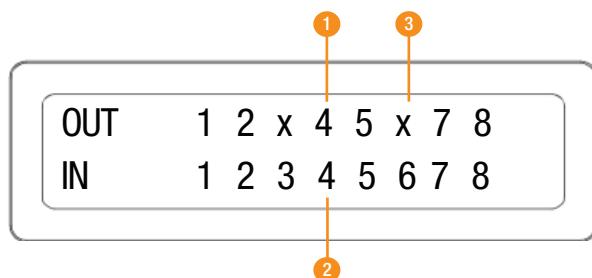
1. To change input selection first press 'OUTPUT' button (1-8)
2. Press desired 'INPUT' button (1-8)
3. An 'X' indicates that the zone output has been turned off.

Zones can be turned on/off using RS-232/TCP/IP commands.

Zone outputs can be forced back on by powering OFF/ON the matrix. All outputs will be turned on when powered up.

Zone outputs can be forced back on by pressing and holding 'OUTPUT 1' button on the front panel for 10 seconds.

The matrix will reset and all outputs will be turned back on.

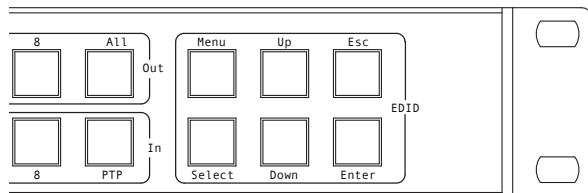


EDID Management - Global or individual input settings

The following characters show adjusting the EDID for 'All' inputs (Global). Current EDID value is set to 1080P & 2ch audio.



To change the input signal type using the Matrix front panel buttons press the following:-



Using Matrix Front Panel Buttons

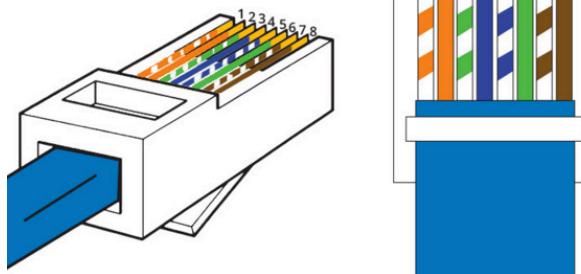
- a. Press **MENU** button
- b. Panel will display 'EDID settings'. Press **SELECT** button
- c. Select the input you wish to fix the EDID on (1-8) or select 'All'. Use **UP/DOWN** buttons to toggle selection and **SELECT** button to confirm
- d. Select video resolution required (4K, 1080p, 3D etc). Use **UP/DOWN** buttons to toggle selection and **SELECT** button to confirm
- e. Select audio resolution required (2CH, 5.1 or 7.1). Use **UP/DOWN** buttons to toggle selection and **SELECT** button to confirm
- f. Press the **ESC** button to exit

Terminating HDBaseT CAT cable

It is important that the interconnecting CAT cable between the ELAN HDBaseT products is terminated using the correct RJ45 pin configuration. The link CAT cable **MUST** be a 'straight' (pin-to-pin) CAT cable and it is advised that this is wired to the T568B wiring standard as this format is less prone to EMI (Electro-Magnetic Interference).

When installing CAT cables it is advised that you use the best possible CAT cable quality possible. HDMI distribution products will only work if used with CAT5e standard cable or above. ELAN recommends using a CAT6 cable for your installations, especially when running over longer distances, in areas of high EMI, or with 4K signal distribution.

RJ45 Pin-Out T568B



Understanding the Matrix/Receiver HDBaseT status lights

The ELAN Matrix and HDBaseT extender solutions include status LED indicators on both the Matrix and Receiver products to show all connections are active and to help diagnose possible problems.

Understanding the status lights:-

ELAN Matrix:

- The Yellow HDBaseT status link light will be off when the zone output has been turned off or there is a problem with the specific Matrix output.
- The Yellow HDBaseT status link light will blink when the zone output is on and working
- The Green HDBaseT link light will blink if there is an unstable connection between the ELAN Matrix and HDBaseT Receiver
- The Green HDBaseT link light will be lit when a there is an active HDBaseT Receiver connected to the Matrix
- The Green HDBaseT link light will be off when a there is no connection with a HDBaseT receiver

ELAN HDBaseT Receiver:

- The HDMI link light will be off when there is no connection with a display
- The HDMI link light will be on when there is an active connection with a display (NOTE - Not all HDBaseT RX feature a HDMI status LED)
- The HDBaseT link light will be off when there is no CAT cable/active HDBaseT connection on the RJ45 HDBaseT input
- The HDBaseT link light will blink if there is an unstable connection between the ELAN Matrx and HDBaseT receiver
- The HDBaseT link light will be lit when a CAT cable is connected to the HDBaseT RJ45 output on the Matrix and an active connection is achieved with the ELAN HDBaseT Receiver.

Infrared (IR) Distribution

The ELAN range of HDMI matrix products include multiple options for control and routing of IR.

IMPORTANT: The ELAN HDMI Platinum, Matrix, & HDBaseT product lines utilize 5 volts to power an IR Receiver on the IR Input and include an EL-4KACC-IR-CAB, 3.5mm Mono to 3.5mm Stereo 5v to 12v IR converter cable. This cable is required when using 12v IR products from Xantech, Niles, and SpeakerCraft.

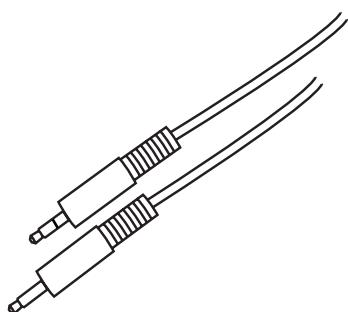
Each ELAN Matrix and HDBaseT receiver is supplied with all necessary IR hardware required and includes:

IR Control Cable - EL-4KACC-IR-CAB

ELAN IR Control cable 3.5mm Mono to 3.5mm Stereo for linking third party IR Receivers to ELAN Platinum, Matrix, and HDBaseT HDMI Series products.

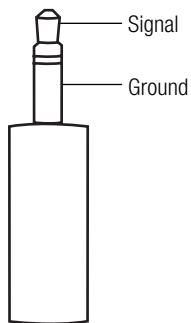
Compatible with 12v IR third party products.

Note: Cable is directional as indicated

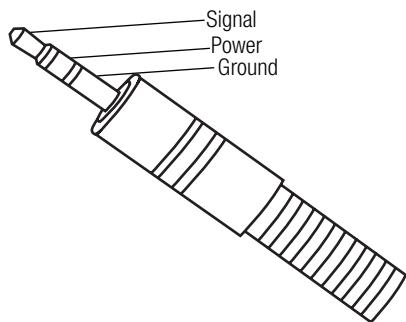


Infrared 3.5mm Pin-Out

IR Emitter - Mono 3.5mm



IR Receiver - Stereo 3.5mm

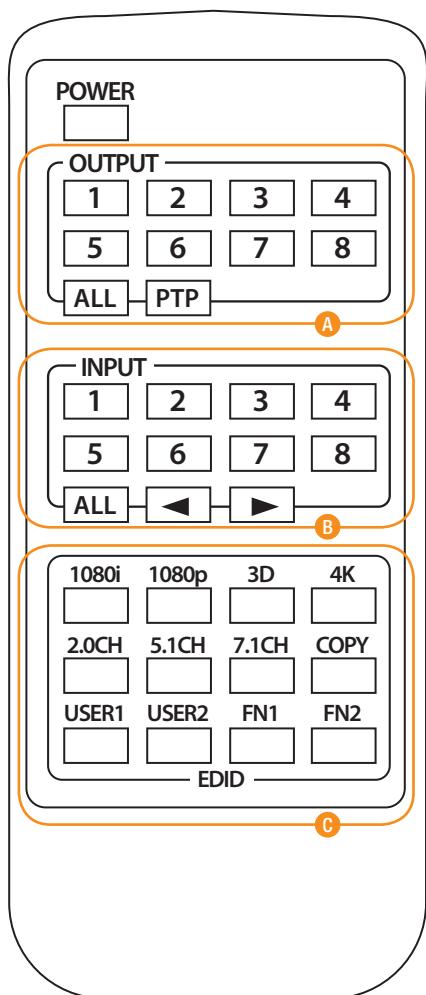


Infrared (IR) Control

The ELAN EL-4KM-V88 Matrix is supplied with one IR Remote Control for source selection and general setup.

As well as controlling matrix solutions using the original ELAN remote the ELAN products can be controlled using the original Infrared codes shown at the rear of this manual.

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 corresponds 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

NOTE: THE BUTTON PRESS SEQUENCE SHOULD BE FINISHED IN 5 SECONDS,
OTHERWISE THE OPERATION IS DISCARDED

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 discover what the best audio and video resolutions need to be outputted.

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.

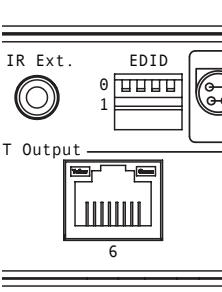
By pre-determining the video resolution and audio format of the source and display device you can reduce the time need for EDID hand shaking thus making switching quicker and more reliable.

Configuration of the EDID settings can be achieved in one of four ways:

- 1 Via the Web GUI
- 2 Using Matrix Front Panel Buttons (For further details see page 7)
- 3 Using Supplied ELAN Matrix IR Remote Control (For further details see page 10)
- 4 Using dip-switches on the rear panel of the EL-4KM-V88 Matrix. Please see below table for global EDID settings.

***Note** - Once dip-switch settings have been made the EL-4KM-V88 must be power cycled for settings to be applied.

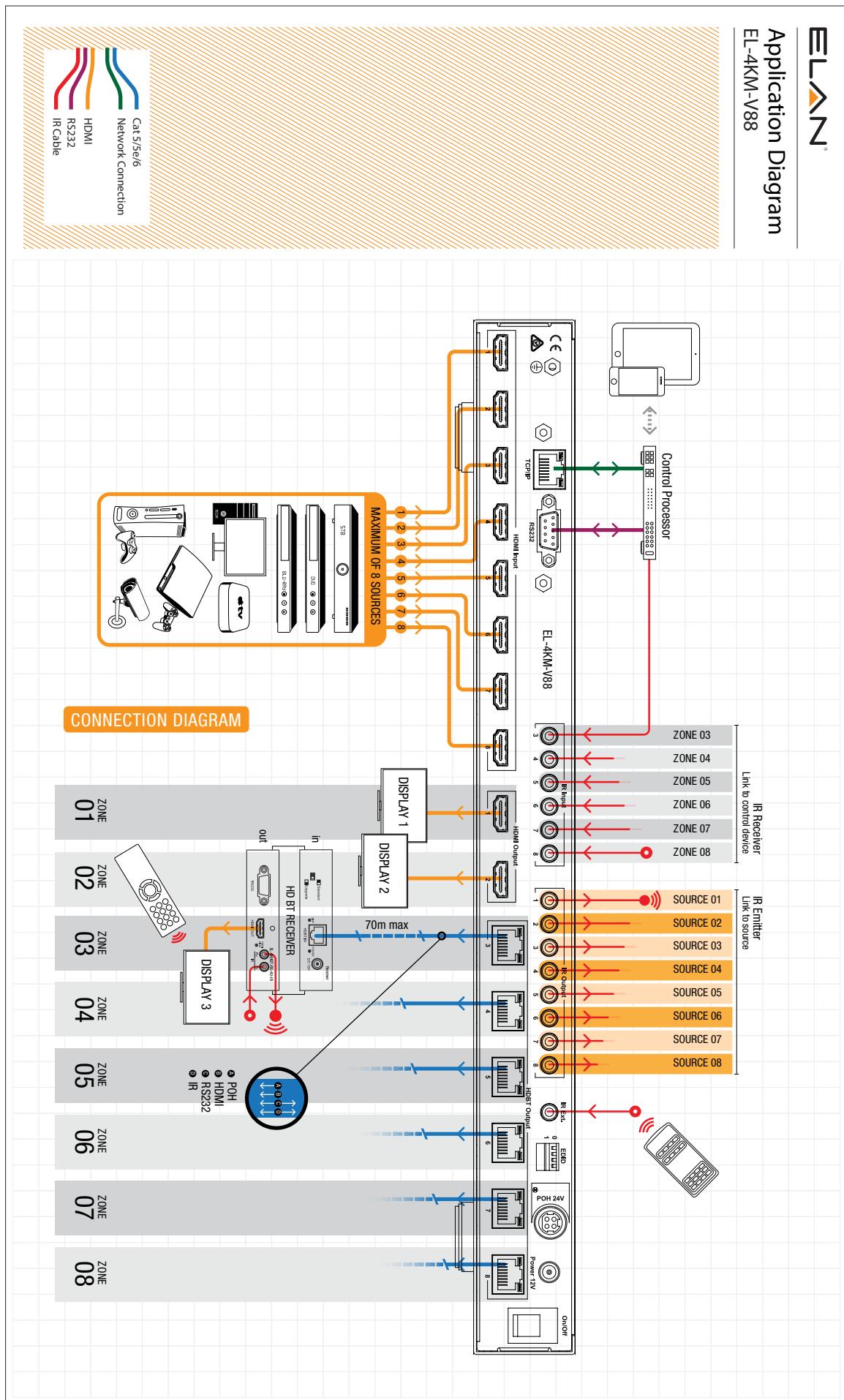
Global EDID settings



Dip-switch position '0' = Off
Dip-switch position '1' = On

DIP ON /OFF SWITCHING POSITIONS					EDID TYPE
3	2	1	0		EDID TYPE
OFF	OFF	OFF	OFF		1080p/2.0
OFF	OFF	ON	OFF		1080i/2.0
OFF	ON	OFF	OFF		4K60Hz 4:2:0 2.0
OFF	ON	ON	OFF		4K30Hz 4:4:4 2.0
ON	OFF	OFF	OFF		4K30Hz 4:4:4 5.1
ON	OFF	ON	OFF		4K30Hz 4:4:4 7.1
ON	ON	OFF	OFF		DVI 1280x1024

Note - When setting EDID values using the dip-switches there are limited EDID types available. It is advised that EDID values are adjusted using the EL-4KM-V88 front panel. For full details please see page 7 'Matrix Front Panel Control'.



Specifications:

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

Video Output Connections: 6x HDBaseT RJ45 connector, 2x HDMI Type A, 19-pin, female

RS-232 serial port: DB-9, female

TCP/IP Control: RJ45, female

IR Input ports: 9x 5v 3.5mm stereo jack

IR Output ports: 8x 5v 3.5mm mono jack

Rack-Mountable: 1U rack height, rack ears included

Casing Dimensions (W x H x D): 440mm x 300mm x 43mm, without feet

Dimensions (W x D x H): 440mm x 305mm x 43mm, with feet

Shipping Weight: 2.7kg

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: 12V/5A DC (main) & 24V/6A DC (POH)

NOTE: Specifications are subject to change without notice.

Package Contents:

- 1 x EL-4KM-V88
- 1 x Rack mounting kit
- 1 x 24V/6A power supply
- 1 x 12V/5A power supply
- 1 x Remote control
Remote Includes CR2025 battery
- 8 x 5v-to-12v IR converter cables
- 1 x User manual
- 8 x Power cables (2x Type A, C, G & I)

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 ELAN EL-4KM-V88 can be controlled via serial and TCP/IP. The following pages list all available serial commands for the EL-4KM-V88 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 OD (in hex)
- Spaces – ELAN 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

RS-232 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
IR ON/OFF	Set System IR Control On Or Off
KEY ON/OFF	Set System KEY Control On Or Off
DBG ON/OFF	Set Debug Mode On Or Off
BEEP ON/OFF	Set Onboard Beep On Or Off
RESET	Reset System To Default Setting (Should Type "Yes" To Confirm, "No" To Discard)
RESET ALL	Reset System And Network To Default Setting
OUT xxON/OFF	Set OUTPUT:xx On Or Off
OUT xx FR yy	Set OUTPUT:xx From INPUT:yy
EDID xx CP yy	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)

RS-232 COMMAND	DESCRIPTION
EDID xx DF zz	<p>Set Input:xx EDID To Default EDID:zz</p> <p>xx=00: Select All INPUT Port xx=[01...08]: Select One INPUT Port yy=[01...08]: Select One OUTPUT Port zz=00: HDMI 1080p@60Hz, Audio 2CH PCM 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: DVI 1280x1024@60Hz, Audio None zz=13: DVI 1920x1080@60Hz, Audio None zz=14: DVI 1920x1200@60Hz, Audio None zz=15: User EDID 1 zz=16: User EDID 2 zz=17: GUI Download EDID zz=18: HDMI 4K@60Hz 4:2:0, Audio 2CH PCM zz=19: HDMI 4K@60Hz 4:2:0, Audio 5.1CH DTS/DOLBY zz=20: HDMI 4K@60Hz 4:2:0, Audio 7.1CH DTS/DOLBY/HD</p>
RESETDEF	Restore factory settings
MXIR xx FR yy	<p>Set HDBT RX:xx IR Out From Local IR In:yy</p> <p>xx=[00]: All HDBT RX IR Out,[03...08]: HDBT RX IR Out yy=[03...08]: Local IR In</p>
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 RB :	Set Network Reboot and Apply New Config!!!
NET TN xxxx :	Set Telnet Port

Infrared Commands

Infrared Commands

Infrared Commands

ELAN Web Browser Interface

The ELAN EL-4KM-V88 matrix unit can be both controlled and configured using the in-built web-server.

The EL-4KM-V88 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 (ELAN 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.

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.



**main:**

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