

# **CMLUX-4H4CAT**

4 by 4 HDMI V1.3

over CAT 6 Matrix with IR

Return Control

**Operation Manual**



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## • **Safety Precautions**

Please read all instructions before attempting to unpack or install or operate this equipment, and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through module openings or empty slots, as you may damage parts.
- Do not attach the power supply cabling to building surfaces.
- Do not allow anything to rest on the power cabling or allow it to be abused by persons walking on it.
- To protect the equipment from overheating, do not block the slots and openings in the module housing that provide ventilation.

## • **Revision History**

<b><i>Version No</i></b>	<b><i>Date</i></b>	<b><i>Summary of Change</i></b>
<b><i>V1</i></b>	<b><i>20091001</i></b>	<b><i>Preliminary Release</i></b>

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## **1. Introduction**

This HDMI over CAT6 Matrix is a high performance equipment with remote control, IR blaster and receiver. It is compatible with HDMI v1.3 specifications, a cutting-edge technology which defines support for Deep Color (12 bits/color) video and new lossless compressed (Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio) digital audio. It offers you the maximum convenience in HDMI signal distribution, when you need to have multiple HDMI sources and displays connected together. Each of the four HDMI sources can be directed to any one of the four HDMI displays, so each display can show a different source. When HDMI signal progresses through the system, it is re-timed, and level-compensated. Furthermore, Since signal is transferred over CAT 6, the distance can be extended over a long range (>50m at 1080p 8 bits) yet at a very low cost. CAT 6 connection can also be built with cascaded function with other devices to enjoy real time play and no signal loss. Moreover, with four individuals output IR blaster systems users can easily control the input source by the existing remote controls.

## **2. Applications**

- Multi-source with multi-display control
- Home entertainment integration
- Multi-task project presentation
- Showroom Display
- Advertising Display control
- System installation control

## **3. Package Contents**

- 4 by 4 HDMI V1.3 Matrix
- Remote Control (with Battery)
- 1 x IR Receiver
- 5 x IR Blaster
- 5V DC Power Supply Adaptor
- Power Cord
- Operation Manual

## **4. System Requirements**

- Input source equipment with HDMI cable(s).
- Output source equipment(s) with HDMI cable(s) and CAT 6 to HDMI receiver(s).

## 5. Features

- HDMI 1.3, HDCP 1.1 and DVI 1.0 compliant
- Supports digital video formats in Deep Color Mode of up to 36 bits (12bits/ color) and new lossless compressed (Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio) digital audio
- HDMI input compensation, clock / phase adjustments, and jitter eliminated guaranteed to output a brand new standard HDMI signal
- Supports input source LED indicators on each output select
- Compatible with all HDMI sources and displays
- Supports a wide range of PC and HDTV resolutions from VGA to UXGA and 480i to 1080p
- Supports RS-232 control
- Supports IR remote control with IR extender and blaster
- Dolby Digital, DTS digital audio transmission (32-192 kHz Fs sample rate)
- Supports CAT 6 cables of variable types
- Defines HDCP, HDMI and DVI source via LED light
- Supports high definition resolution, the cable distance test at 1080p/8 or 12 bits resolution: input & output sources max. distance up to 15 meters

### Notes:

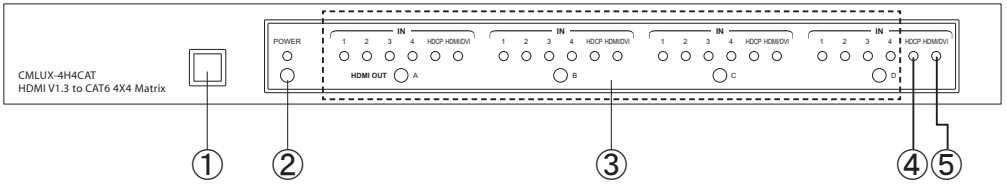
- A. Cable used during test is CAT-6E / 23AWG / Solid and therefore, cables of different specification may have different distance results.
- B. Cable distance test equipment used: PS3 20G, 37" Philips 8 bit LCD TV and 37" Samsung 12 bit LCD TV.
- C. Figures provided in this manual are for reference use only, actual figures very depending on source and display used with cable specification.

## 6. Specifications

Frequency Bandwidth	2.25Gbps (single link)
Input Ports	4 x HDMI female ports,
Output Ports	4 x Video/DDC CAT 6 ports
EDID	Standard, TV/Moving Port 1
ESD Protection	Human body model: $\pm 10\text{kV}$ (air-gap discharge) $\pm 6\text{kV}$ (contact discharge)
HDMI Audio Output	PCM2, PCM5.1, PCM7.1, Dolby5.1, DTS5.1, DD+, D-TrueHD, and DTS-HD
HDMI Cable In	1080p 8-bit (15M), 1080p 12-bit (15M)
HDMI Cable Out	1080p 8-bit (15M), 1080p 12-bit (15M)
CAT 6 Cable Out	1080p 8-bit (45M), 1080p 12-bit (15M)
Color Space	RGB_24/36, YCbCr 4:4:4_24/36, YCbCr 4:2:2, xvYCC
IR IN/OUT	Yes/Yes
Deep Color	1080p 12-bit
HDMI Resolution	480i~1080p 50/60, 1080p 24, VGA~UXGA
DVI Resolution	480i~1080p 50/60, 1080p 24, VGA~UXGA
Power Supply	5VDC/6A (US/EU standards, CE/FCC/UL certified)
Dimensions (mm)	438(W) x 175(D) x 44(H)
Weight(g)	2150
Chassis Material	Aluminum
Silkscreen Color	Black
Operating Temperature	0°C ~ 40°C / 32°F ~ 104°F
Storage Temperature	-20°C ~ 60°C / -4°F ~ 104°F
Relative Humidity	20% ~ 90% RH (non-condensing)
Power Consumption	16.5W (MAX)

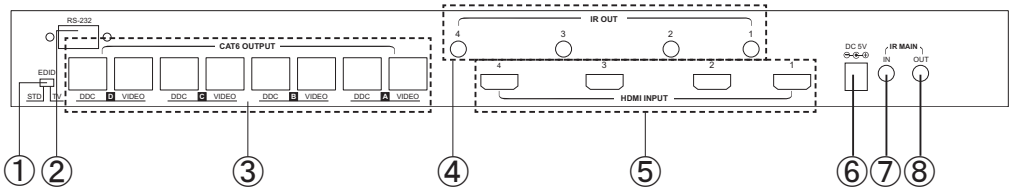
## 7. Operation Controls and Functions

### 7.1 Front Panel



- ①. Remote control sensor.
- ②. Power switch & LED Indicator: This LED will illuminate when the power is turned on.
- ③. Input Select/Indicators (A/B/C/D): Press each “HDMI out” button repeatedly to switch to your desired source. The LED that illuminates to indicate the input source being selected and routed to HDMI A display.
- ④. HDCP indicators: This LED will illuminate once the input source being played comes with a HDCP protection.
- ⑤. HDMI/DVI indicators: When the input is HDMI content, this LED will illuminate. When playing DVI from the input source, this LED will not illuminate.

### 7.2 Rear Panel



- ①. EDID Control Switcher: Default factory setting is on TV, leave as it is when the display is displaying properly. Switch to STD to use built-in EDID.

#### **Note:**

1. When EDID is switched to TV, the unit will detect the first HDMI output source's EDID and record it in the unit. If the first detected output source is DVI, it will skip onto the next source until the first HDMI source is detected. The detection priority is HDMI v1.3 > HDMI v1.2 > DVI.



2. When EDID is switched to STD, the unit will use its built-in EDID that supports:

Video →1080p 12-bit (max) supports xvYCC

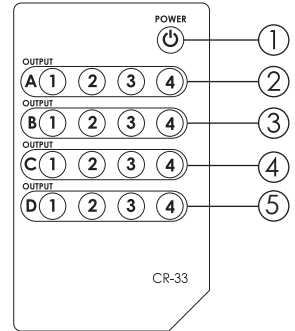
Audio →PCM 2CH

3. The EDID selection will only be activated after the unit is re-plugged and powered on.

- ②. RS-232: This slot is where you connect a D-Sub 9-pin cable to the PC COM port when controlling the device over RS-232. Detailed specifications are listed in section 9.
- ③. Video/DDC CAT 6 outputs: These slots are where you connect two CAT6 cables to a receiver box that has HDMI output and through the HDMI output it can be connect to TV. The receiver box can also be a splitter that provides additional CAT6 outputs when cascading from a HDMI receiver to the display via HDMI cable.
- ④. IR OUT: These slots are where you connect with IR blaster cables included in the package. Place it near each designate source equipment for infrared signal sending.
- ⑤. HDMI inputs: These slots are where you connect input ports to the HDMI or DVI output of your source equipments such as DVD player or set-top-box with HDMI cables.
- ⑥. Power: Plug the 5VDC power supply into the unit and connect the adaptor to an AC wall outlet.
- ⑦. IR MAIN IN: This slot is where you connect the IR receiver cable included in the package. Connecting the IR receiver cable allows you to source equipments through the existing remote controls.
- ⑧. IR MAIN OUT: This slot is where you connect the IR blaster cable included in the package. Place it near both the device and/or source equipments for infrared signal sending.

## 8. Remote Control

1. Power: Press this button to turn on/off the unit.
2. Input Select for HDMI OUT A: Press 1, 2, 3 or 4 to select the desired input source for HDMI OUT A.
3. Input Select for HDMI OUT B: Press 1, 2, 3 or 4 to select the desired input source for HDMI OUT B.
4. Input Select for HDMI OUT C: Press 1, 2, 3 or 4 to select the desired input source for HDMI OUT C.
5. Input Select for HDMI OUT D: Press 1, 2, 3 or 4 to select the desired input source for HDMI OUT D.



## 9. RS-232 Protocol

### 9.1 Pin Definitions

CMLUX-4H4CAT			Remote Control Console	
PIN	Definitions		PIN	Definitions
1	NC		1	NC
2	TxD		2	RxD
3	RxD	→	3	TxD
4	NC		4	NC
5	GND		5	GND
6	NC	←	6	NC
7	NC		7	NC
8	NC		8	NC
9	NC		9	NC

\* RS-232 transmission format:

Baud Rate: 9600bps

Data Bit: 8 bits

Parity: None

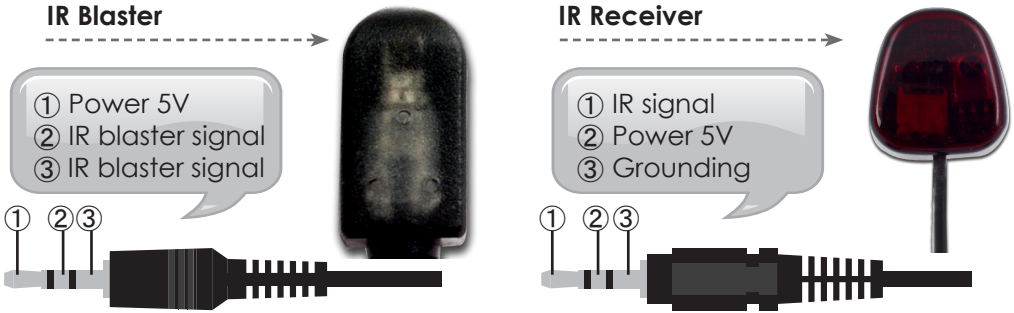
Stop Bit: 1 bit

Flow Control: None

## 9.2 Commands

<b>COMMAND</b>	<b>ACTION</b>
POWER 00 ←	Power Off (standby)
POWER 01 ←	Power On
PORT 11 ←	Output A select Input1
PORT 12 ←	Output A select Input2
PORT 13 ←	Output A select Input3
PORT 14 ←	Output A select Input4
PORT 21 ←	Output B select Input1
PORT 22 ←	Output B select Input2
PORT 23 ←	Output B select Input3
PORT 24 ←	Output B select Input4
PORT 31 ←	Output C select Input1
PORT 32 ←	Output C select Input2
PORT 33 ←	Output C select Input3
PORT 34 ←	Output C select Input4
PORT 41 ←	Output D select Input1
PORT 42 ←	Output D select Input2
PORT 43 ←	Output D select Input3
PORT 44 ←	Output D select Input4

### 9.3. IR Cable Pin Definitions



**Note:** The frequency on both IR Receiver & Blaster can support 20~60KHz.

## 10. 3.5Ø Connectors Pin Definitions

### 10.1 IR IN Pin Definitions

Pin	Assignment
1	Power 5V
2	IR Signal
3	GND

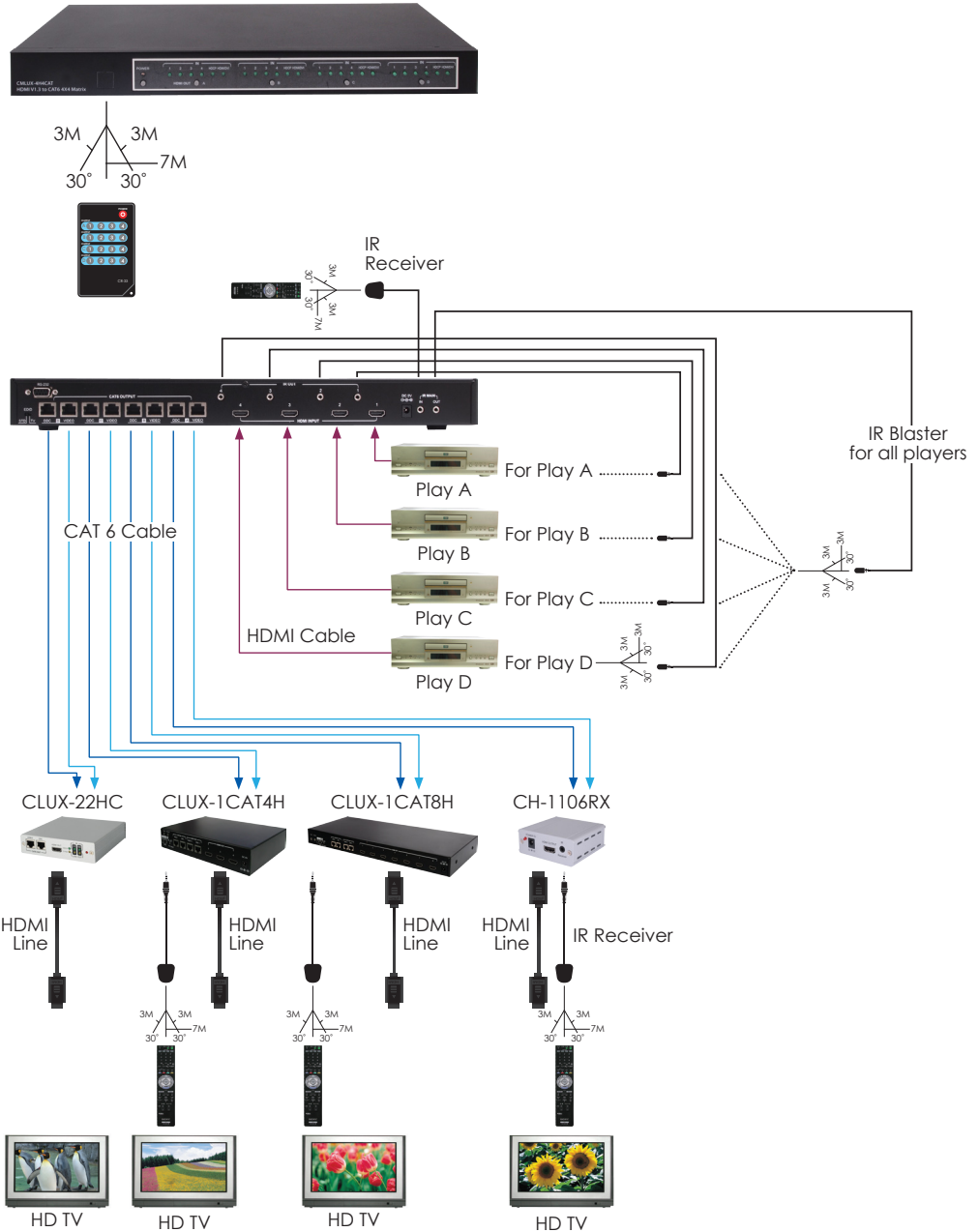
### 10.2 IR OUT Pin Definitions

Pin	Assignment
1	IR Blaster Signal
2	Power 5V
3	IR Blaster Signal

### 10.3 RJ-45 Pin Definitions

Pin	Video	DDC
1	TX2+	DDC Bus Clock
2	TX2-	NC
3	TX1+	DDC Bus Data
4	TX0+	Power 5V
5	TX0-	GND
6	TX1-	IR IN
7	TXC+	HPD
8	TXC-	NC

# 11. Connection and Installation





# Acronyms

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<b>Acronym</b>	<b>Complete Term</b>
CAT6	Category 6 Cable
DTS	Digital Theater Systems
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
HDCP	High-Bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
IR	Infrared
UXGA	Ultra Extended Graphics Array
VGA	Video Graphics Array





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