

1275 Danner Dr Tel:330-562-7070 TECHNOLOGIES Aurora, OH 44202 Fax:330-562-1999

# SM-4X4-4K18GBA-LC

# 4x4 HDMI2.0 Matrix

# Support 4K@60hz YUV4:4:4, 18Gbps, HDR

**Operating Instruction** 



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.

# **Table of Contents**

1. Features	4
2. Package Contents	4
3. Specifications	4
4. Panel Descriptions	5
5. Connecting and Operating	6
6. Application Diagrams	6
7. Remote Control Description	7
8. RS232 Pin Assignment	7
9. RS232 Control 9.1 Software Control 9.2 Command Control	8 8 11
<ul> <li>10. Web Control</li> <li>10.1 Static IP Address</li></ul>	13 13 13 14 15
11. Online upgrading firmware	17

# **Dear Customer**

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.

### 1. Features

- HDMI 2.0 version (Support 4K@60Hz YUV4:4:4)
- Support 3D
- Bandwidth upto 18Gbps
- HDCP2.2 input ,HDCP2.2 output
- HDCP1.4 input, HDCP1.4 output
- Support HDR10
- 4xHDMI Input, 4xHDMI output with 4xSPDIF Audio
- Any one of the 4 Ultra HD sources to any one of the 4 Ultra HD displays
- Support Panel Button, Local IR, RS232 Control with command, IP Control, Web GUI Control
- Support Dolby True HD and DTS-HD master audio
- Unit size: L216XW105XH34mm

# 2. Package Contents

- 1). 1x HDMI Matrix
- 2). 1x 5V DC power supply
- 3). 1x Remote control
- 4). 1x IR Ext RX Cable
- 5). 1x Phoenix plugs for RS232 cable termination
- 6). 1x mounting kit
- 7). 1x CD for control software & user manual

# 3. Specifications

Operating Temperature	-4°F to 140°F (-20°C to 60°C)
Storage Temperature	-40°F to 158°F (-40°C to 70°C)
Resolution	480p@60hz,576P@50hz,720P@60hz, 1080P@24hz,1080P@50hz,1080P@60hz,4K@24hz,4K@30hz, 4K@60hz YUV4:2:0, 4K@ 60hz YUV4:4:4
Video Input Connectors	4xHDMI Type A, 19-pin, female
Video Output Connectors	4xHDMI Type A, 19-pin, female
RS-232 serial port	3PIN terminal block connectors
Ethernet port (IP control)	RJ45, female
IR Ext port	1x3.5mm stereo jack
Bandwidth	18 Gbps
Default IP	192.168.1.168
Rack-Mountable	Rack ears included
Dimensions(WxHxD)	L216XW105XH34mm
Net Weight	0.72kg
Power consumption	13W(Max)

# 4. Panel Descriptions



- ① IR receive window.
- 2 Output button OUT1~4: choose the desired output port from input ports 1~4.
- Note: 1) To Turn ON/OFF DHCP function: Press the selector buttons of output 1 and output 2 at the same time for 3 seconds.
  - 2) To restore factory settings: With all outputs connected to input 1, press the selector buttons of output 3 and output 4 at the same time for 3 seconds.



- ① SPDIF Audio output.
- 2 For IR external receiver cable.
- ③ RS232 for control or upgrading the firmware.
- ④ USB micro 5P port for upgrading the firmware.
- ⑤ IP control.
- 6 DC power input.
- ⑦ HDMI input port.
- (8) HDMI output port.

# 5. Connecting and Operating

- 1. Connect source devices to input ports of the matrix
- 2. Connect HDMI output ports to TV or other HDMI sink devices.
- 3. Optional: connect RS232 cable from PC RS232 port.
- 4. Optional: connect an Ethernet cable from the TCP/IP port on the matrix to a local area

network.

- 5. Connect 5V POWER supply to DC power socket.
- 6. Power ON the matrix, HDMI sources and displays.

# 6. Application Diagram



# 7. Remote Control Description



① Standby Mode.

② OUTPUT-X select INPUT-Y: Press OUTPUT-X (X means 1 to 4 of outputs) Press INPUT-Y (Y means 1 to 4 of inputs)
③ All outputs select INPUT-Y: Press ALL button in zone OUTPUT Press INPUT-Y button (Y means 1 to 4 of inputs), then INPUT-Y switched to ALL OUTPUTS.
④ Cancel Button: Cancel the switching operation
⑤ PTP button: Mirror all inputs and outputs (Ex. Input 1 to output 1, input 2 to output 2, etc):

Press PTP button in Zone OUTPUT.

Matrix	Remote C	control Console
Assignment	PIN	Assignment
	1	NC
Тх	2	Rx
Rx	3	Тх
	4	NC
GND	5	GND
	6	NC
	7	NC
	8	NC
	9	NC

# 8. RS232 Cable Pin Assignment

# 9. RS232 Control

#### 9.1 Software control

Connect the 4x4 Matrix to PC with a RS232 cable (see pinout table on page 7), open the software "PC Tool" included with the download of this manual. On the COM Setting session, select the COM port according to your PC and click "Connect" to get connected.

On this COM setting session, you can also change the Device name, Device name supports up to 16 characters. Save or edit your status by clicking the "Edit" button.

Come to Port Set session to select or switch your input sources for each output. We can read the current status by clicking the "Status" button, or Clear our historical operating record by clicking "Clear" button. The right down blank shows the operating history.

HDMI 2.0 4*4 Matrix COM Setting Port: COM9 - Search Disconnect! Device Name	Port Set EDID Config   IP Config   Net Config   System Cor Output 1 1 2 3 4 1 Output 2	nfig Status Clear Get All Ports Load All config data success! Set Input 2 to Output 2! Waiting Set success!
4*HDMI2.OMatrix Get Edit	1     2     3     4     2       Output 3     1     2     3     4     3       Output 4     0     0     0     0	Set Input 3 to Output 3! Waiting Set success! Set Input 4 to Output 4! Waiting Set success! Set Input 1 to Output 1! Waiting Set success!
	1 2 3 4 4 Output All 1 2 3 4 1	4

Picture 1: Porting Setting

The EDID session helps us to Read and Configure EDID for each input, such as HDR, 3D, Data rates and Audio channel.

Search		S	et Input HDMI	1		
)isconnect!	EDID Mode:	4K2K@60Hz (YC444)	•	Read		Apply
	T HDR 🔽	1080P 4K2K@30Hz 4K2K@60Hz (YC420)	it	⊂ 7.1 CH	⊂ 5.1 CH	© 2.0 CH
ice Name		4K2K@60Hz (YC444) Copy From TV1	я :	2		
HDMI2.OMatrix	EDID Mode:	Copy From TV2 Copy From TV3 Copy From TV4		Read		Apply
Get	F HDR 🔽	3D □ 30Bit □ 36Bit	☐ 48Bit	○ 7.1 CH	С 5.1 СН	@ 2.0 CH
Edit		S	et Input HDMI 🗧	3		
	EDID Mode:	4K2K@60Hz (YC420)	•	Read		Apply
		3D 🗆 30Bit 🗖 36Bit	☐ 48Bit	○ 7.1 CH	C 5.1 CH	@ 2.0 CH
		S	et Input HDMI 🤞	1		
	EDID Mode:	4K2K@60Hz (YC420)	•	Read		Apply
	🗆 HDR 🔽	3D 🗆 30Bit 🗖 36Bit	☐ 48Bit	C 7.1 CH	C 5.1 CH	@ 2.0 CH

Picture 2: EDID Setting

The IP configure session helps to read and configure the IP address and MAC of the Matrix. Click DHCP if you want the router to automatically assign an IP for the Matrix, then click "Save IP Config". Otherwise, you can assign network settings manually here. After doing so, click "Save IP Config" to have them take effect.

Search	- IP Address Setting									
Disconnect!	Host IP Address:	192	. 16	3.	1		168			
	Net Mask:	255	. 25	5.	255	4	0			
evice Name	Router IP Address:	192	. 16	3.	1	4	0			
Get										

Picture 3: IP Config

The Net Config section allows us to configure the PC and the Matrix (provided they are in the same LAN) with the IP Address and make a connection.

If you don't change the default settings, the Host (Matrix) IP address is 192.168.1.168.

If you wish to change the Network Settings, make the changes on the screen under "IP Config", and then click "Save IP Config" (see Picture 3).

If you want to have a DHCP server apply settings, click the box next to "DHCP", and then click "Save IP Config" (see Picture 3). Wait **at least** 5 minutes for the IP Address settings to update to what the DHCP server assigns. (The setting blocks will also gray out so that you cannot edit them.) Then enter the displayed IP address into your browser to open the control interface (Page 14, Picture 11).

#### Use the Discovery Feature to Identify the IP address assigned by the DHCP server

Note: This is only truly useful if you have multiple Matrix Switches connected to the LAN and need to know what IP address is assigned to each.

1. Under "Net Config" ("1" right), the address and port number of your PC connection should already be shown under "Current PC Information". Click "Connect" ("2" right) to the right of that information.

2. The Host Device Information section will be shown. Click "Search Device" ("3" below). The IP address and Matrix switch name for any Matrix Switches connected to your subnet will be displayed.

urrent PC Inform IP Address:	nation 192 . 168 .	0.140	Ports: 5001	Cor	2) nnect	

Picture 4: Net Config

3. If there are more than one connected to the subnet, make sure the Matrix you want to control is indicated under "Set Device Number" ("4" below), and click "Connect" ("5" below) next to the Host Device IP Address.

4. To open the web interface for the Switch to control it, either go to your browser and enter the IP address shown, or, click the "IE" button ("6" below) and the PC's default browser will open automatically to that IP address.

Port: COM1 - Search Connect	Port Set   EDID Config   IP Config   art Config   System Config         Current PC Information       IP Address:     192 . 168 . 0 . 140       Ports:     5001       Disconnect
GetEdit	Host Device Information 6 3 IP Address: 192 . 168 . 0 . 173 Connect Search Device 1->IP=192.168.0.173 Name=4*4HDMi2.0Matri 6 Sel Device Number: 1
	Reset

Picture 5: Net Config (Cont'd)

The last section is System Config, which allows the user to power ON/OFF or to Reset, resetting the Matrix to default settings.

	Apply
On OFF	
	Power Ctrl On OFF

Picture 6: System config

**9.2 RS232 Command Control** 1). Open a terminal program. Use one that has a "Send" box for sending commands (i.e. Terminal.exe).

2). Connection port settings:

Baud Rate:	115200 bps
Parity:	None
Data Bits:	8 bit
Stop Bits:	1 bit

#### 3). Enter Port Command in "Send" box.

	CommUart Assistant	·₩\ - □ :
COM Settings	Data receive	AVAGE V4.2.0
PortNum COM9 BaudR 115200 DPaity NONE DataB 8 StopB 1 Close Recv Options Receive to file Auto linefeed Show timestamp Receive as hex	Data receive MtPeW0E000203010203020203030203342 s3448444d49322s304d61747269784 MtPeW0E000203010203020203030203342s3448444d49322s304d61747269784 MtPeW0E000203010203020203030203342s3448444d49322s304d61747269784 MtPeW0E000203010203020203030203342s3448444d49322s304d61747269784 MtPeW0E000203010203020203030203342s3448444d49322s304d61747269784 MtPeW0E000203010203020203030203342s3448444d49322s304d61747269784 MtPeW0E000203010203020203030203342s3448444d49322s304d61747269784	¥ ¥ ¥ ¥
Fause receive Save Clear Send Options Data from file Auto checksum Auto clear input Send as hex Period 1000 ms Load Clear	1.DCD ◆ 2.RXD ◆ 3.TXD ◆ <u>4.DTR</u> ◆ 5.GND ◆ 6.DSR ◆ <u>7.RTS</u> ◆ @₩ 04 03 02 01 00 #	8.CTS ♦ 9.RI 4 ————————————————————————————————————
🗲 COM Settings	Send: 67 Recv: 1816	Reset

Picture 7

4). Command		
Command	Function	Note
	DTD Eurotian	Mirror all inputs and outputs
@ \V 04 00 01 02 03 #	PTP Function	(Ex. Input 1 to output 1, input 2 to output 2, etc)
@W 50 #	Reboot	
@W 51 #	Restore Factory Setting	
	Ctore dlb v	00: Standby Mode
@ W 0F 00 #	Standby	01: Cancel "Standby Mode"

#### 5). Select HDMI input for HDMI output

Command	Description
00	Output1
01	Output2
02	Output3
03	Output4
04	All Output
00	Input1
01	Input2
02	Input3
03	Input4

E.g: @W 00 00 #: Output 1 display Input1

Output 1

- Input1

6). EDID Setting

@W XX AA BB #:

Parameter Description:

# XX for configuration of "INPUT EDID"

Command	05	06	07	08
Description	Input1	Input2	Input3	Input4

# AA for selecting "Video Mode"

Command	00	01	02	03
Description	1080P	4K2K_30	4K2K_60(YC420)	4K2K_60(YC444)

**BB** for selecting below function

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
HDR	48Bit	36Bit	30Bit	7.1CH	5.1CH	2CH	3D
1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0

"1" : choose the function, "0" : doesn't choose the function.

E.g: 11001001: HDR, 48Bit, 7.1CH, 3D

Chang Binary code "11001001" to hexadecimal format "C9".

# E.g: @W 05 03 C9 #

The EDID of input 1 is: 4K2K\_60(YC444)、HDR、48Bit、7.1CH、3D.

# 10. Web Control

#### 10.1 Static IP Address.

The default IP Address of HDMI Matrix is 192.168.1.168.

#### 10.1.1 Change the IP address of your PC.

- 1). Connect the HDMI Matrix and PC to the LAN.
- 2). Configure your PC as follows:
- ① Click Start > Control Panel > Network and Sharing Center.
- 2 Click Change Adapter Settings.
- Highlight the network adapter you want to use to connect to the device and click
   Change settings of this connection.
- 3). Connect to the device and click change settings of this connection:

etworking	Sharing		
Connect u	sing:		
🔮 Intel	(R) 82579V 0	Gigabit Network Conr	nection
			Cartaria
This compa	action uses th	e following items:	Configure
Conne	to the Market of the	a Natural and Natural	
	lient for Micro	North Networks	
	oS Packet S	cheduler	
	UST BORGE SI	cheduler	
🖌 📕 Fi	le and Printer	Sharing for Microsof	ft Networks
Fi 🛃 Fi 🕹 🖬	ile and Printer itemet Protoc	Sharing for Microsof ol Version 6 (TCP/IP	ft Networks Pv6)
	ile and Printer iternet Protoc iternet Protoc	<ul> <li>Sharing for Microsof</li> <li>Version 6 (TCP/IP</li> <li>Version 4 (TCP/IP</li> </ul>	ft Networks Pv6) Pv4)
	ile and Printer iternet Protoc iternet Protoc ink-Layer Top	Sharing for Microsof ol Version 6 (TCP/IP ol Version 4 (TCP/IP oology Discovery Map	ft Networks 2v6) 2v4) pper I/O Driver
	ile and Printer iternet Protoc iternet Protoc ink-Layer Top ink-Layer Top	Sharing for Microsof ol Version 6 (TCP/IP ol Version 4 (TCP/IP ology Discovery Map ology Discovery Res	ft Networks Pv6) Iv4) pper I/O Driver sponder
	ile and Printer itemet Protoc itemet Protoc ink-Layer Top ink-Layer Top all	Sharing for Microsof ol Version 6 (TCP/IP ol Version 4 (TCP/IP ology Discovery Map ology Discovery Res Uninstall	ft Networks 2v6) 2v4) pper I/O Driver sponder Properties
Finite State	ile and Printer itemet Protoc ink-Layer Top ink-Layer Top all	Sharing for Microsof ol Version 6 (TCP/IP ol Version 4 (TCP/IP ology Discovery Map oology Discovery Res Uninstall	ft Networks <sup>1</sup> v(6) <sup>1</sup> v(4) pper I/O Driver sponder Properties
Fi      Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi     Fi          Fi          Fi	Ile and Printer Itemet Protoc Itemet Protoc Ink-Layer Top Ink-Layer Top all on version 6. Th	Sharing for Microsof Ol Version 6 (TCP/IP iol Version 4 (TCP/IP iology Discovery Mag bology Discovery Res Uninstall     ine latest version of th	ft Networks vr(6) vv(4) pper I/O Driver sponder Properties ie internet protocol
Find the second	le and Printer ternet Protoc ternet Protoc ink-Layer Top ink-Layer Top all on version 6. Th vides communi	- Sharing for Microsoft - Sharing for Microsoft - Sharing 6 (TCP/IP - Nology Discovery Mag - Nology Discovery Mag - Uninstall - Hanstall - Hatest version of the - Inication across diversion of the microsoft	ft Networks (v6) (v4) poper I/O Driver sponder Properties te internet protocol se interconnected
Final States Sta	le and Printer ternet Protoc ternet Protoc ink-Layer Top ink-Layer Top all on version 6. Th vides communits.	- Sharing for Microsoft - Sharing for Microsoft - ICP/IP - Nology Discovery Mag - Nology Discovery Res - Uninstall - Initiation across diven	ft Networks (v6) v4) poper I/O Driver sponder Properties te internet protocol se interconnected
<ul> <li>✓ ■ Fi</li> <li>✓ ▲ In</li> <li>✓ ▲ I</li> <li>✓ ■ I</li>     &lt;</ul>	le and Printer ternet Protoc ternet Protoc terne	Sharing for Microsoft tol Version 6 (TCP/IP iol Version 4 (TCP/IP iology Discovery May bology Discovery May bology Discovery Res Uninstall the latest version of the nication across diverse	ft Networks (v6) (v4) sponder Properties re internet protocol se interconnected

Picture 8

- 4). Highlight Internet Protocol Version 4 (TCP/IPv4) by clicking on the item.
- 5). Click **Properties**.

eneral	Alternate Configuration				
You car this cap for the	n get IP settings assigned a bability. Otherwise, you nee appropriate IP settings.	utomatically if d to ask your	your n retwoi	etwork s rk admini	upports strator
() ()	otain an IP address automa	tically			
O Us	e the following IF address:				
IP ad	ddress:		4		
Subr	iet mask:	201	14	25	0
Defa	ult gateway;	(6		+	
@ 0	otain DNS server address a	utomatically			
() Us	e the following DNS server	addresses:			
Prefi	erred DNS server:				1
Alter	nate DNS server:		÷		
E v	alidate settings upon exit			Adva	nced

Picture 9

6). Select **Use the following IP Address** for static IP addressing and fill in the details. For TCP/IPv4 you can use any IP address in the range 192.168.1.2 to 192.168.1.254 (excluding 192.168.1.168).

You can get IP settings assigned this capability. Otherwise, you ne for the appropriate IP settings.	automatically if your network supports eed to ask your network administrator
🔘 Obtain an IP address autom	natically
• Use the following IP address	S:
IP address:	192.168.1.2
Subnet mask:	255.255.255.0
Default gateway:	<b>.</b>
Obtain DNS server address	automatically
Obtain DNS server address	er addresses:
Preferred DNS server:	
Alternate DNS server:	
Validate settings upon exit	Advanced

Picture 10

7). Click **OK**.

8). Click Close.

#### 10.1.2 Open the web browser and control the matrix.

1). Open the Web browser and enter the IP address of the HDMI Matrix:192.168.1.168, then you can set the function as below pictures:

· -> C 0 1	92.168.1.168				■ ☆
Port Set		EDID	Config		IP Config
		Port S	Set page		
Outpu	1: Input 1	Input 2	Input 3	Input 4	4
Output	2: Input 1	Input 2	Input 3	Input 4	4
Output	3: Input 1	Input 2	Input 3	Input 4	4
Output	4: Input 1	Input 2	Input 3	Input 4	4
Output	Input 1	Input 2	Input 3	Input 4	1

Picture 11: Port Setting Page

#### **Operating Instruction**



Picture 13: IP Configuration Page

#### 10.2 Using DHCP server

You can also choose "DHCP" for HDMI Matrix (refer to section 9.1 picture3) 1). Connect the HDMI Matrix and PC to the LAN.



2). Open the PC tool.

3). Search for the IP address of HDMI Matrix, (refer to page 10, section 9.1 pictures 4 & 5).4). Open the web browser and enter the IP address you found in picture 5, then you

can set the function as shown below:

ort Set		EDID	Config		IP Cont
		Port	Set page		
Output1	Input 1	Input 2	Input 3	Input 4	4
Output2:	Input 1	Input 2	Input 3	Input 4	4
Output3:	Input 1	Input 2	Input 3	Input 4	4
Output4:	Input 1	Input 2	Input 3	Input 4	4

Picture 14: Port Setting Page

→ C ① 192.168	.0.20	Bi 🕁
Port Set	EDID Config	IP Config
	EDID Set page	
Input HDMI1:	4K2K@60Hz[YC444] •	Apply
🗎 3D 🗐 3	0Bit 🗐 36Bit 🗐 48Bit 🔍 7.1Ch	© 5.1Ch 🖲 2.0Ch
Input HDMI2:	4K2K@60Hz[YC444] •	Apply
🗎 3D 🗐 3	0Bit 🗍 36Bit 🗐 48Bit 🗐 7.1Ch	© 5.1Ch 🖲 2.0Ch
Input HDMI3:	4K2K@60Hz[YC444] •	Apply
🛙 3D 🗐 3	0Bit 🗐 36Bit 🗐 48Bit 🎯 7.1Ch	© 5.1Ch * 2.0Ch
Input HDMI4:	4K2K@60Hz[YC444] •	Apply
Bap Ba	08it 368it 488it 97.1ch	0 5.1ch # 2.0Ch

Picture 15: EDID Setting Page

#### **Operating Instruction**

e - C O	192.168.0.20		<b>₽</b>   ☆
Port Set	EDID	Config	IP Confi
	IP Cor	ifig page	
	MAC Address:	6C 51 38 07 63 9C	
	Host IP Address:	192, 168, 0, 20	
	Net Mask Address:	255 255 255 0	
	Router IP Address:	192.168.0.1	
	Device Name:	1234567890123456	
	Понго		

Picture 16: IP Configuration Page

# 11. Online upgrading firmware.



1). Connect the HDMI Matrix with PC via USB or RS232 port.

2). Open the software to upgrade firmware (no new software available at this time).

3). Click "Search" choose the port, then click "connect", then you can see "S3R(C)", click "Load FW File" to upload the firmware, click "update", the firmware can be upgraded in one minute.

IPDATE_FW	0	505	5-0-05		
Uart config	2	0	3		
Port Sel:	сома —	Search	Disconnect!		
S3RLC			Reset		
<u>U</u>			<u></u>		
	<i></i>				
D:\upgradır	ng firmware\MUX	ALL_HDMI20(1).hex			Load FW File
					Update
					- Clear
14				+	

Picture 17:Upgrading firmware

# MAINTENANCE

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

#### **PRODUCT SERVICE**

#### (1) Damage requiring service:

The unit should be serviced by qualified service personnel if:

- (a) The DC power supply cord or AC adaptor has been damaged;
- (b) Objects or liquids have gotten into the unit;
- (c) The unit has been exposed to rain;
- (d) The unit does not operate normally or exhibits a marked change in performance;

The unit has been dropped or the cabinet damaged.

(2) **Servicing Personnel:** Do not attempt to service the unit beyond that described in these operating instructions.Refer all other servicing to authorized servicing personnel.