avgear

USER MANUAL

AVG-CS4K-44 V2

Matrix Switcher
4K HDBaseT 4x4

Version: CS4K-44 V2_2017V1.0

This product is a professional 4K HDBaseT Home Distribution Matrix Kit, which consists of a 4K HDBaseT Matrix Switcher, 3 HDBaseT Receivers and all accessories required for a standalone system. This system is also capable of being fully integrated into a whole home control system solution.

Features

- Supports HDMI 1.4 & HDCP 2.2, is compliant with lower standards.
- Supports manual HDCP management and auto-detection
- Transmits 4Kx2K signal for 8m via HDMI port, 40m via HDBT ports
- 3 HDBaseT outputs, distances up to 70m at 1080p and 40m at 4Kx2K on a single CAT6
- The HDBaseT Receivers are powered by the matrix switcher, 12VDC via PoC technology
- LED indicators show real-time switching status.
- Control via front panel, RS232, IR and TCP/IP
- Supports bi-directional IR & RS232 control
- Built-in GUI for TCP/IP control
- Powerful EDID management

PLEASE READ THIS PRODUCT MANUAL CAREFULLY

BEFORE USING THIS PRODUCT.

This manual is only for operational instruction only, and is not to be used in a maintenance capacity. The functions described in this version are current as at September 2017. Any changes of functions and operational parameters will be updated in future manual versions. Please refer to your dealer for the latest product details.

Version 1.0 08/09/17

SAFETY OPERATION GUIDE 

In order to guarantee the reliable operation of the equipment and safety of the user, please abide by the following procedures in installation, use and maintenance:

1. The system must be earthed properly. Please do not use two blade plugs and ensure the AC power supply ranges from 100v to 240v and from 50Hz to 60Hz.
2. Do not install the switcher in an environment where it will be exposed to extreme hot or cold temperatures.
3. This unit will generate heat during operation, please ensure that you allow adequate ventilation to ensure reliable operation.
4. Please disconnect the unit from mains power if it will be left unused for a long period of time.
5. Please DO NOT try to open the casing of the equipment, DO NOT attempt to repair the unit. Opening the unit will void the warranty. There are high voltage components in the unit and attempting to repair the unit could result in serious injury.
6. Do not allow the unit to come into contact with any liquid as that could result in personal injury and or product failure.

TABLE OF CONTENTS

1. Introduction

1.1. Introduction to the AVG-CS4K-44 V2

This AVG-CS4K-44 V2 is a professional 4K HDBaseT Home Distribution Matrix Kit, which consists of a 4K HDBaseT Matrix Switcher, 3 HDBaseT Receivers and its accessories.

The 4K HDBaseT Matrix Switcher consists of 4 HDMI IN, 3 IR IN, 1 IR CONTROL, 4 IR OUT, 3 HDBaseT OUT, 1 HDMI OUT, 1 SPDIF OUT, 1 L&R RCA OUT, TCP/IP and an RS232 control port via phoenix connector.

All HDMI inputs can be selected by either the front panel buttons, IR, RS 232 or GUI. The selected source is delivered to the HDBaseT zoned outputs 1~3 & HDMI Output.

The Matrix Switcher supports EDID management and is HDCP 2.2 & HDMI 1.4 compliant.

1.2. Features

- Supports HDMI 1.4 & HDCP 2.2, and is compliant with lower standards, able to transmit 4Kx2K@60Hz 4:2:0 & 1080p 3D
- Supports manual HDCP management and auto-detection
- Transmits 4Kx2K signal for 8m via HDMI port, 40m via HDBT ports
- 3 HDBaseT outputs, distances up to 70m at 1080p and 40m at 4Kx2K on a single CAT5e/6 cable can be achieved
- The HDBaseT Receivers are powered by the matrix switcher, 12VDC via PoC technology
- LED indicators show real-time switching status
- Controllable via front panel, RS232, IR and TCP/IP
- Supports bi-directional IR & RS232 control
- Built-in GUI for TCP/IP control
- Powerful EDID management
- Supports non-volatile memory [NVM] for reliable operation
- Supports firmware upgrade through the Micro USB port
- Easy installation with rack-mounting design

2. What's in the Box

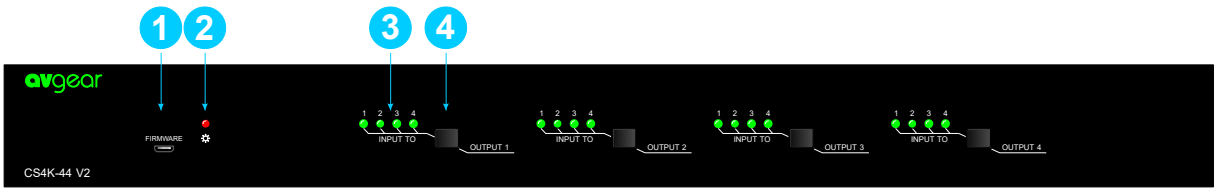
4K HDBaseT Matrix Switcher	▪ 1 x CS4K-44 V2 4K HDBaseT Matrix Switcher ▪ 2 x Mounting Ears with 6 Screws ▪ 4 x Rubber feet ▪ 3 x IR Remotes ▪ 4 x 5V IR Receivers ▪ 4 x 5V IR Emitters ▪ 1 x RS232 Cable (Phoenix to 9-pin D-Sub) ▪ 1 x Power Adapter (DC 24V 2.71A)
HDBaseT Receivers	▪ 3 x HD200R HDBaseT Receivers ▪ 6 x Mounting ears with 12 Screws ▪ 12 x Rubber Feet
	▪ 1 x User manual

Note: Please confirm if the products and the accessories are all included, if not please contact your dealer.

3. Product Appearance of the AVG-CS4K-44 V2

3.1 4K HDBaseT Matrix Switcher

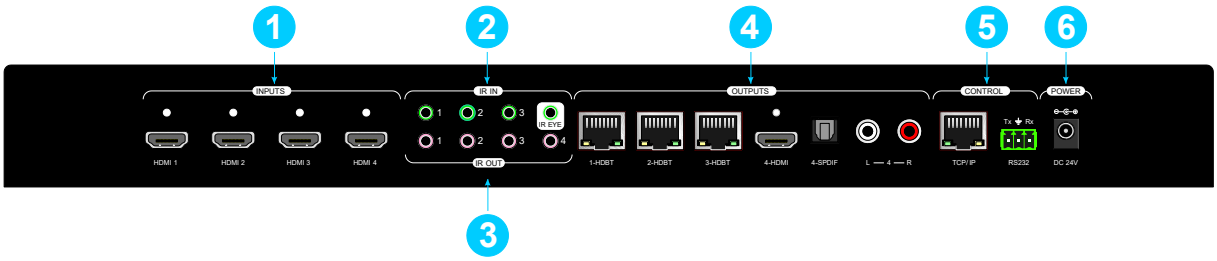
Front Panel



No.	Name	Description
①	FIRMWARE	Micro USB port for updating firmware
②	Power Indicator	▪ **OFF**: No power; ▪ **RED**: DC power present or Standby Mode
③	INPUT selector Indicators	Total of 4 groups, each group includes 4 green indicators for 4 input sources, numbered from "1" to "4"
④	Output selector button	Total of 4 output selector buttons, press the buttons to select desired input

Note: Pictures shown in this manual are for reference only.

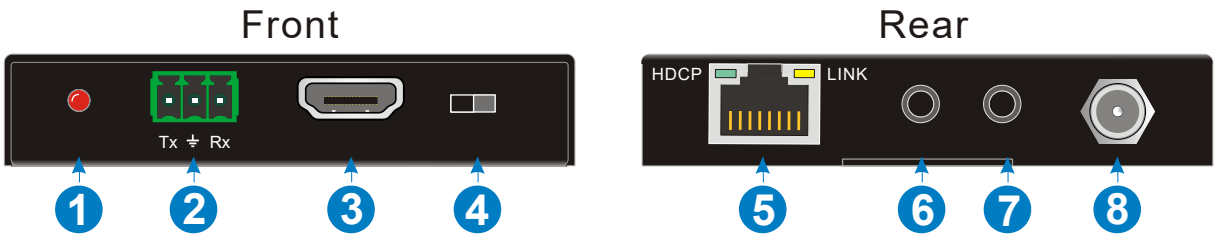
Rear Panel



No.	Name	Description
①	HDMI INPUTS	4 x HDMI input ports, type A female HDMI connector, connect the Source with an HDMI cable to any of the HDMI inputs
②	IR IN	▪ **3 x IR IN:** Connect with IR receiver, fixed IR input for the output, cannot be switched separately. It makes up an IR bi-directional TX path with the IR OUT on the corresponding HDBaseT receiver. ▪ **1 x IR CONTROL:** Connect with extended IR receiver, use the IR remote to control the Matrix Switcher
③	IR OUT (1~4)	Plug in the IR Emitter and attach to the front of the Source. This then emits the IR signal received from the HDBaseT Receiver. There are 4 IR OUTPUT sockets marked on the IR matrix
④	OUTPUTS	▪ **HDBaseT:** The HDBT RJ45 outputs deliver HD video, Audio and PoC to the HDBaseT Receiver up to 70m ▪ **HDMI:** Connect an HDMI cable from the Matrix Switcher to the display ▪ **SPDIF:** Digital audio output connects directly via an optic fiber cable to a Toslink input on source equipment ▪ **RCA (L&R):** PCM Analogue audio output sockets supply the de-embedded audio
⑤	Control	▪ **TCP/IP:** RJ45 port. Connect with a PC for Web-based GUI control. ▪ **RS232:** Serial port for unit control, 3-pin pluggable terminal block, connects with a control device (e.g. Control processor)
⑥	DC 24V	Connect with a DC24V 2.71A power adaptor

Note: Pictures shown in this manual are for reference only.

3.2 HDBaseT Receiver



No.	Name	Description
①	Power LED	Illuminates red when power is applied.
②	RS232	Phoenix plug to connect a RS232 device.
③	HDMI OUT	HDMI port for connecting the video display.
④	CTRL/UPDATE	Switch to select the mode of the RS232 port. When in the **CTRL** position, it serves as a RS232 serial extender. When in the **UPDATE** position, it allows you to update the Valens IC program by connecting to a PC and running the batch file.
⑤	HDBT IN	RJ45 socket for connecting the Cat5e/6 cable to the matrix.
⑥	IR IN	3.5mm socket to connect a 5V IR Receiver
⑦	IR OUT	3.5mm socket to connect a 5V IR Emitter.
⑧	DC 12V	DC barrel connector for connecting the included AC power adaptor.

4. System Connection

4.1 System Applications

The new 4K Home Distribution Matrix Kit is designed for the residential market delivering HD Video, Audio to 4 zones with total control and simplicity.
Usage Precautions:

1) The 4K Home Distribution Matrix Kit should be installed in a clean and dust free environment.
2) Ensure that all plugs, power cords and sockets are in good condition.
3) All devices should be connected before power is turned on.

4.2 Connection Diagram

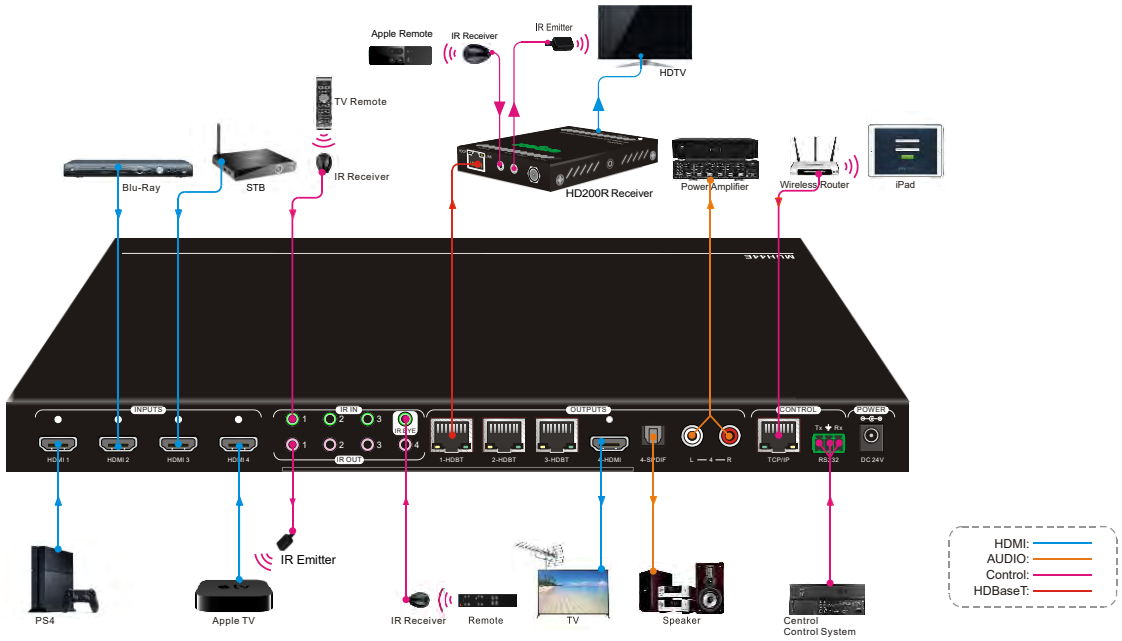


Figure 4- 1 Connection diagram

4.3 Connection Procedure

1) Connect HDMI sources (e.g. DVD) to HDMI input ports of the Matrix Switcher using good quality HDMI cables
2) Connect the Pre-Installed CAT5e/CAT 6 cable infrastructure to the Matrix Switcher and HDBaseT receivers
3) Connect a HDTV or AV Receiver to the HDMI output port with a HDMI cable.
4) Plug in a HDMI cable in to each of HDBaseT Receivers and connect to the local display [HDTV]
5) Connect an AV Receiver or Amplifier to the SPDIF output port or via the Toslink fiber optic cable
6) Connect an amplifier to the L&R (RCA) output RCA connectors with an audio cable
7) Connect the IR Receivers 3.5mm plug into the IR IN sockets on the HDBaseT Receivers and plug in the IR Emitters to the IR OUT sockets (1~4) on the Matrix

Switcher to make up the IR Matrix

8) Plug the phoenix connector in to the RS232 socket on the matrix, this will enable the Matrix Switcher to be controlled via a PC or 3rd Party Controller

9) Plug in a Patch lead from the router in to the Ethernet port on the Matrix Switcher to control the Matrix Switcher via TCP/IP protocol

10) Plug in the 24V DC Power supply adapter and tighten to secure. Once all components have been connected and the installation is completed, switch on the mains supply at the socket

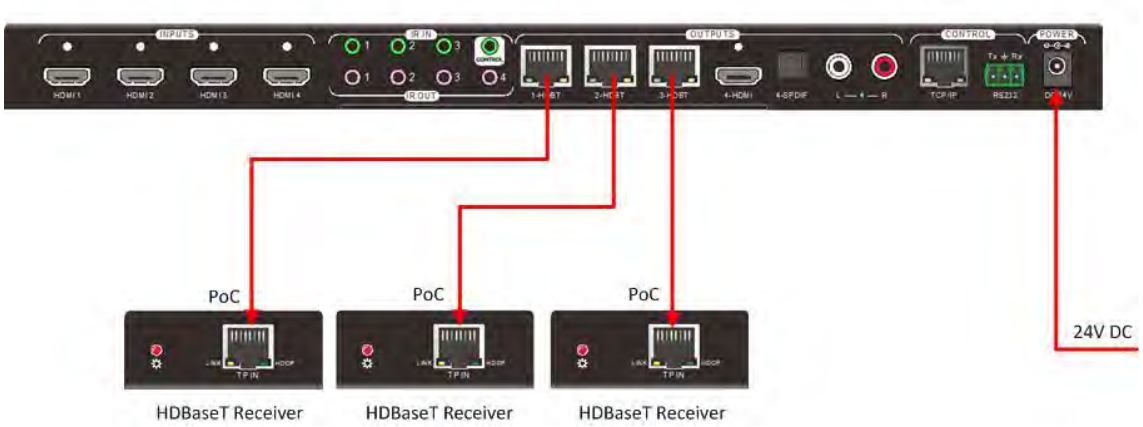
Note:

- Connect HDBT ports of Matrix Switcher and far-end HDBaseT Receivers with straight-through cable. Do not install through patch panels, wall sockets etc.

- IR receivers connected to IR IN should contain carrier. If required, send the RS232 command %0900. or %0901.to activate native carrier mode or force carrier mode in the IR matrix between the Matrix Switcher and the far-end HDBaseT Receiver.

4.4 Connection with the HDBaseT Receiver

The Matrix Switcher has 3 HDBaseT outputs which support PoC technology. Connect HDBaseT Receivers to the pre-installed cabling. Plug the power supply in to the power socket on the matrix, the HDBaseT Receivers will be powered by the Matrix Switcher via PoC.



5. System Operations

5.1 IR Control

5.1.1 IR Remote Description

Connect an IR receiver to the **IR CONTROL** port of the Matrix Switcher, users can control the matrix through the included IR remotes. Here is a brief introduction to the IR remote.

1) Standby button, press it to enter/exit standby mode.

2) Input channels, range from 1~4, corresponding IR signal is switched synchronously when switching input channels.

3) OUTPUTS
- **In normal mode:** output channel selection buttons.
- **In EDID invoke mode:** use buttons 1 & 2 to select between the 5 embedded EDID data's.

4) Menu buttons: ALL, EDID, CLEAR and ENTER.
- **ALL**: Select all inputs/outputs.
- **EDID** management button: Enable input port to manually capture and learn the EDID data of the output devices.
- **CLEAR:** Withdraw an operation like switching an output channel, learning EDID data before it comes into effect. Meanwhile, the matrix will return to the previous state.
- **ENTER:** Confirm operation. Press and hold it for 3 seconds to enter in Query mode.

Note: With this IR remote, the Matrix Switcher can be controlled by the built-in IR, the extended IR receiver connected to the **IR CONTROL** and the IR receiver on the far-end receiver balun.

By using IR & HDBaseT transmission technology, the 4K Home Distribution Matrix Kit has the following control options:

1) Control a far-end output device locally.

2) Control local input/output device remotely.

3) Control the Matrix Switcher locally/remotely.

5.1.2 Using the IR Remote

5.1.2.1 Switching I/O connection

1) To switch one input to an output:

Example: Input 1 to Output 3

→Press INPUTS 1 + OUTPUTS 3 + ENTER

NOTE:
Default status, on first boot up this matrix assigns the IR outputs to the corresponding HDMI input, meaning, IR out 1 is directly associated to HDMI input 1 and so on. When you switch an HDMI input to a different output, the corresponding IR OUT will be switched synchronously to allow the IR commands to be sent from the select zone back through the Matrix Switcher to the source.

2) To switch an input to multiple outputs:

Example: Switch Input 2 to Output 3 and 4

→Press INPUTS 2 + OUTPUTS 3 + OUTPUTS 4 + ENTER

3) To switch an input to all outputs:

Example: Input 1 to all Outputs

→Press INPUTS 1 + ALL + ENTER

5.1.2.2 EDID Management

The 4K Home Distribution Hub Kit features EDID management that enables the Matrix Switcher to learn the EDID of all sources and sink devices. The Matrix Switcher can learn the EDID from any device or be programmed to assign an EDID to the mirror port through EDID Invoking.

1) EDID Learning (from output) :

✓ One input port learns the EDID data of one output port:

Example: Input 2 learns EDID data from output 4

→Press EDID + INPUTS 2 + OUTPUTS 4 + ENTER

✓ All input ports learn EDID data from one output port:

Example: all input ports learn EDID data from output 4

→Press: EDID + ALL + OUTPUTS 4 + ENTER

2) EDID invoking:

There are five types of embedded EDID data. The chart below illustrates the detailed information of the embedded EDID data:

No.	EDID Data
1	1080P 2D 2CH
2	1080P 3D 2CH
3	1080P 2D Multichannel
4	1080P 3D Multichannel
5	3840x2160 2D（30Hz）

Press and hold “EDID” for 3 seconds to enter EDID invoke mode. In this mode, use the output buttons 1 & 2 to select the required embedded EDID data. Then press “ENTER” to confirm.

Format: Press and hold “EDID” button for 3 seconds, INPUT# +OUTPUT1/2 + ENTER.

Invoke embedded EDID data for one input:

Example: set the EDID data of input 2 to the fourth type of embedded EDID data

→Press EDID (hold for 3 seconds to enter into EDID set status) + INPUTS 2 + OUTPUTS1 or 2 + ENTER

5.1.2.3 Clear Operation

When you switch an output channel, learn EDID data, or set EDID data, press the “Clear” button to EXIT the operation before you press “ENTER” to finish. When you press “Clear”, the Matrix Switcher will return to its previous state.

5.1.3 Force Carrier

a) Only if the IR receiver connected to the HDBaseT receiver has an IR carrier, can the received IR signal be transferred to the IR OUT port of the Matrix Switcher.

b) Only if the IR receiver connected to the Matrix Switcher has an IR carrier, can the received IR signal be transferred to the IR OUT port of the Matrix Switcher.

If the IR receiver connected to HDBaseT receiver or the Matrix Switcher is without an IR carrier signal, send the RS232 command “%0901.” to enter infrared carrier enforcing mode, and then the IR signal will be enabled to the IR OUT ports.

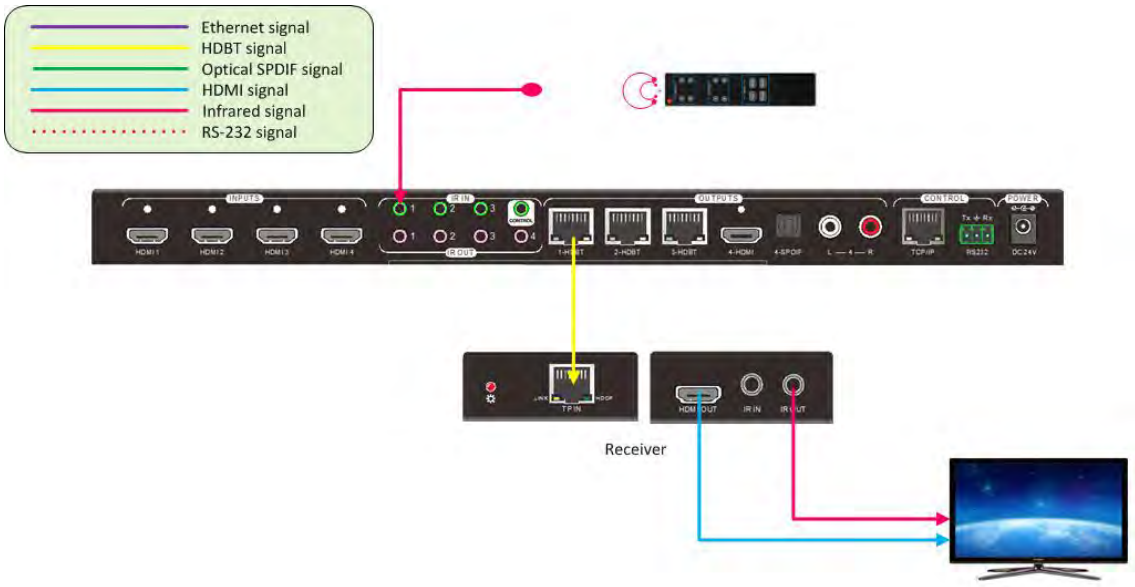
5.1.4 Controlling a Far-end Device from the Matrix location

Connect an IR receiver to the IR IN on the Matrix Switcher. Use the IR Remote of the far-end device to control the device locally.

Connect an IR receiver with IR carrier to the IR IN port of the Matrix Switcher, users can control a far-end output display via its IR remote locally.

In this case, the IR signal is transferred via twisted pair. Only the corresponding IR OUT port can emit control signals to the remote display.

See the figure below:



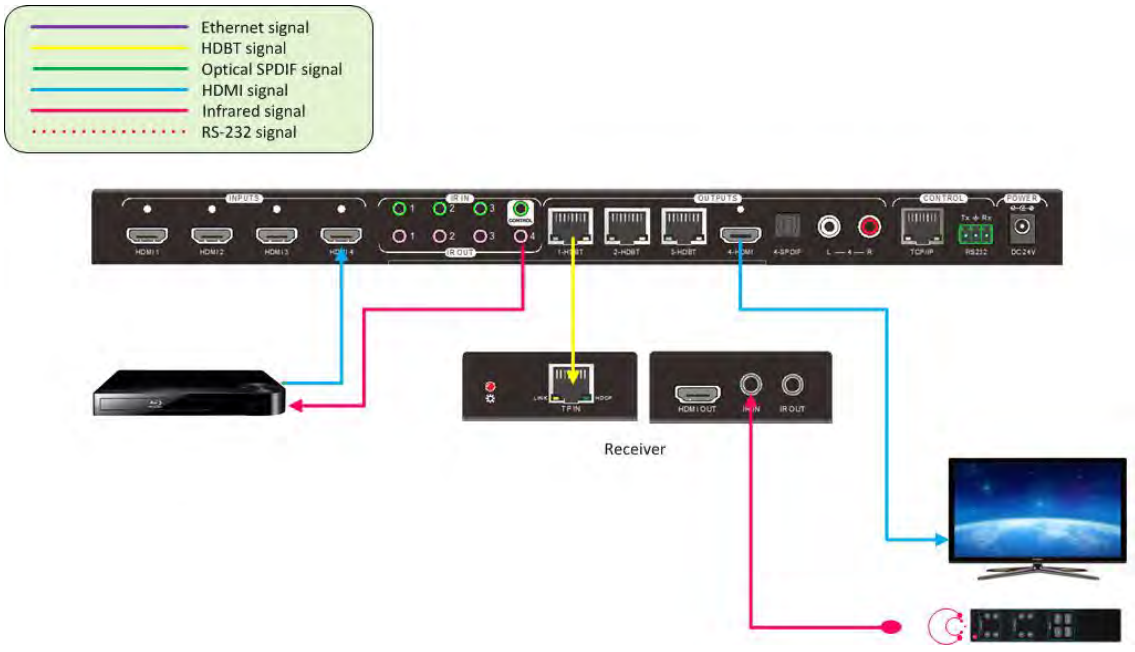
Controlling a Far-end Device from the Matrix location

Note: The IR receiver connected to **IR IN** must contain an IR carrier

5.1.5 Controlling a Local Device Remotely

Connect IR receiver(s) to IR IN on the far-end HDBT receiver(s), and IR Emitter(s) to IR OUT port of the switcher, and use the IR Remote of local source to control the device remotely.

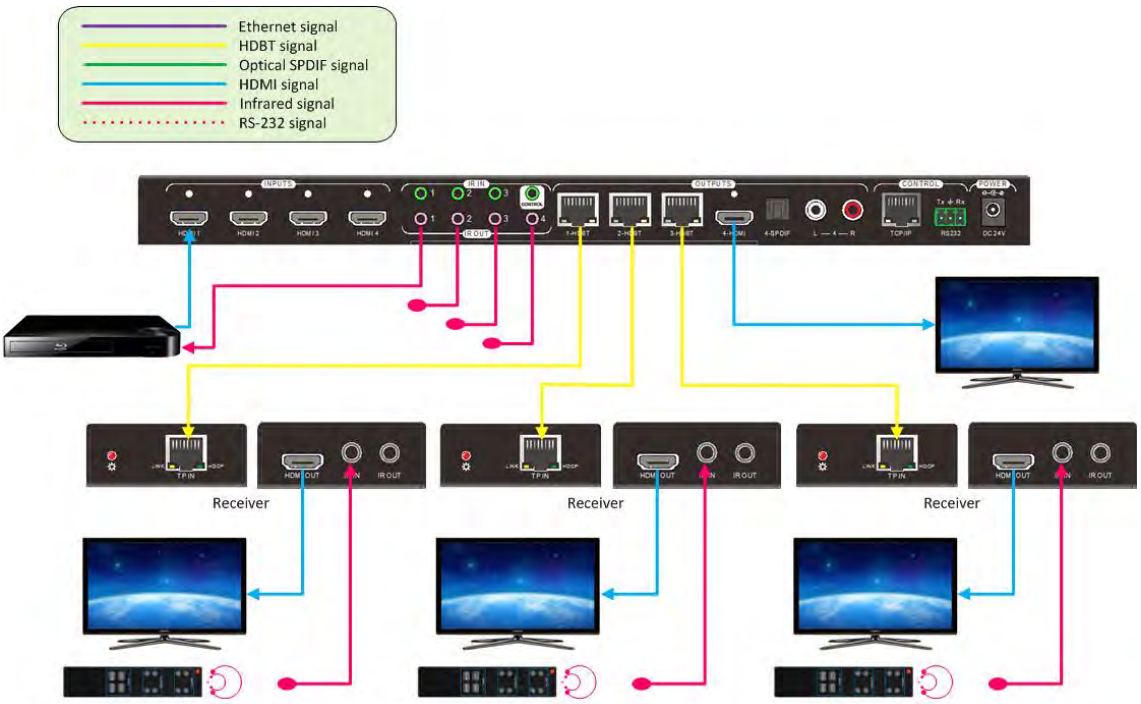
- **1 to 1:**
  Connect an IR receiver to IR IN on far-end HDBT receiver, and an IR Emitter to IR OUT port of the switcher. Use the IR Remote of local source to control the device remotely. See below:



Controlling a Local Device remotely

Note: Send command “%0901.” to enter infrared carrier enforcing mode if the IR Receiver connected to IR IN of the receiver does not have an IR carrier.

- **Multiple to Multiple: (IR Matrix)**
  The 4 “IR OUT” ports and the 3 “IR IN” ports on the far-end receivers make up a 4x3 IR matrix. See as below:



IR Matrix

The IR signal is sent by an IR remote, then it is input to the HDBaseT receiver, then to the corresponding zone of the matrix through the twisted pair, finally it is transferred to the IR OUT port and received by the appropriate source device.

Switching Operation:

Sending command (reference to *5.2 RS232 Control)*: [x1]R[x2].

x1: Corresponding to the 4 IR OUT ports of the Matrix Switcher, the IR transmitter connected to this port can be placed at the IR receiving area of output device or the Matrix Switcher itself.

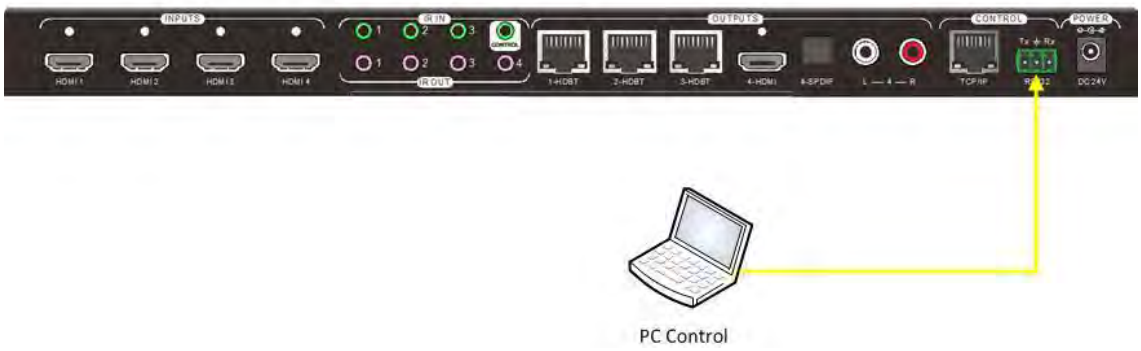
x2: Corresponding to the zone (receive IR signal from HDBaseT receiver with IR IN port, connects with IR receiver) number of the Matrix Switcher.

→ Example: Send command “3R2.” to transfer IR signal received from zone 2 to IR OUT port 3.

5.2 RS232 Control

5.2.1 RS232 Connection

Aside from the front control panel, the Matrix Switcher can also be controlled by a 3rd party control system/PC through the RS232 communication port. This RS232 communication port is a 3-pin phoenix connector. Use the supplied RS232 cable (Phoenix to 9-pin D-Sub) to connect to the RS232 port to a PC, see as below:



5.2.2 Installation/Removal of the RS232 Control Software

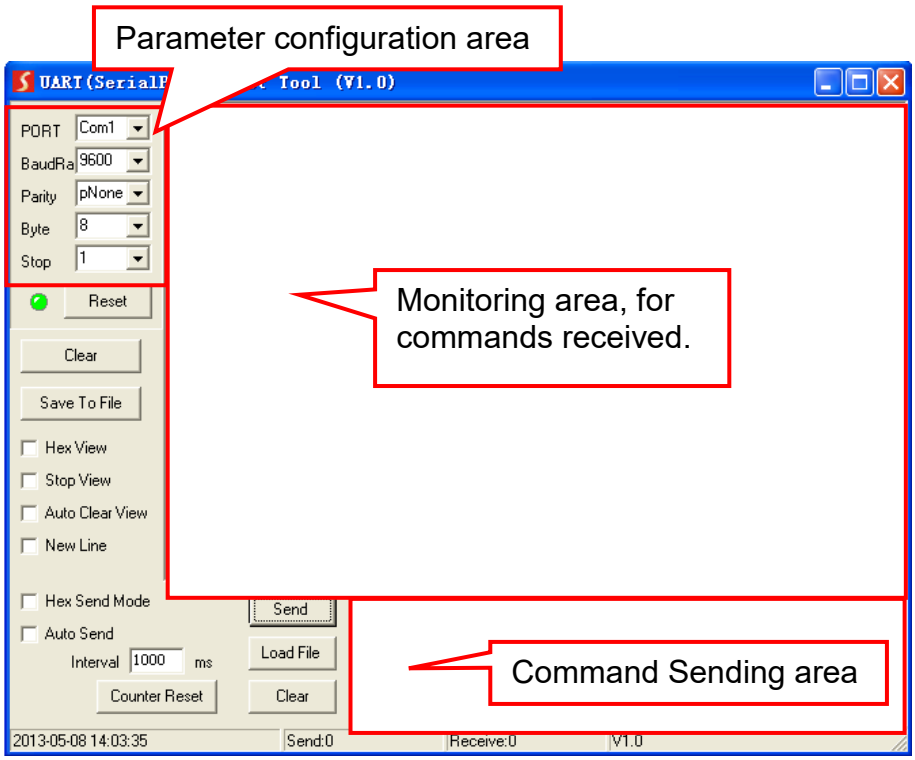
- **Installation** Copy the control software file to the computer connected with the Matrix Switcher.
- **Removal** Delete all the control software files in the corresponding file path.

5.2.3 Basic Settings

Firstly, connect the Matrix Switcher with an input device and an output device. Then, connect it with a computer which has installed RS232 control software. Double-click the software icon to run this software.

Here we take the software **CommWatch.exe** as example. The icon is showed as below:

The interface for the control software is showed as below:



Please set the parameters for COM number, baud rate, data bit, stop bit and the parity bit correctly, only then will you be able to send command in the Command Sending Area.

5.2.4 RS232 Communication Commands

Note:

1) Please disconnect all twisted pairs before sending command EDIDUpgrade[X].
2) In the above commands, "["and "]" are symbols for easy reading and do not need to be typed into the actual operation command.
3) Please remember to end the commands with the end symbols "." and ";".
4) Type the command carefully, it is case-sensitive.

Baud rate: 9600 Data bit: 8 Stop bit: 1 Parity bit: none

Command	Function	Feedback Example
System Commands		
/*Type;	Query the models information.	XXXXX
/%Lock;	Lock the front panel buttons on the Matrix.	System Locked!
/%Unlock;	Unlock the front panel buttons on the Matrix.	System Unlock!
/^Version;	Query the version of firmware	VX.X.X
Demo.	Switch to the "demo" mode, switch input and output in sequence e.g. 1B1, 1B2, …4B3, 4B4,	Demo Mode AV:01->01

Command	Function	Feedback Example
	1B1… and so on .The switching interval is 2 seconds.	IR:01->01 AV:01->02 IR:01->02 …… AV:04->04 IR:04->04 ……
Operation Commands		
[x]All.	Route signal from the input channel [x] to all output channels	X To All. (X=01~04)
All#.	Route all input signals to the corresponding output channels respectively like 1->1, 2->2…	All Through.
All$.	Switch off all the output channels.	All Closed.
[x]#.	Route signals from the input channel [x] to the output channel [x].	X Through. (X=01~04)
[x]$.	Switch off the output channel [x].	X Closed. (X=01~04)
[x]@.	Switch on the output channel [x].	X Open. (X=01~04)
All@.	Switch on all output channels.	All Open.
[x1]V[x2].	Route the AV signal from the input channel [x1] to one or several output channels ([x2], separate output channels with comma).	AV: X1-> X2 (X1/X2=01~04)
[x1]B[x2].	Route the AV and IR signal from input channel [x1] to one or several output channels ([x2], separate output channels with a comma).	AV: X1-> X2 (X1/X2=01~04)
[x1] R[x2].	Route the IR signal from output [x1] to input [x2].	IR: X1-> X2(X1、X2=01~04)
Status[x].	Check the I/O connection status of output [x]	AV: Y-> X (X=01~04, Y=01~04)
Status.	Query the input channel to each output channel one by one.	AV: 01->01 … … AV: 04->04 IR: 01->01 … … IR: 04->04
Save[Y].	Save the present operation to the preset command [Y], range is from 0 to 9.	Save To FY (Y=0-9)
Recall[Y].	Recall the preset command [Y].	Recall From FY (Y=0-9)
Clear[Y].	Clear the preset command [Y].	Clear FY (Y=0-9)
PWON.	Work in 'normal' mode.	PWON
PWOFF.	Enter into standby mode and cut off the power supply to HDBaseT receivers.	PWOFF
STANDBY.	Enter into standby mode. (Do not cut off the power supply to HDBaseT receivers, press any button or send commands to start.)	STANDBY
/%[Y]/[X]:[Z].	HDCP management command. [Y] is for input (value: I) or output (value: O); [X] is the number of the port, if the value of X is ALL, it means all ports; [Z] is for HDCP compliant status, the value may be 1 (HDCP compliant) or 0 (not HDCP compliant).	/%[Y]/[X]:[Z].
DigitAudioON[x].	Enable HDMI audio output of port x. ▪ X=1, 2, 3, 4, enable this port. ▪ X=5, enable all the 4 ports.	DigitAudio ON with [x]

Command	Function	Feedback Example
DigitAudioOFF[x].	Disable HDMI audio output of port x. ▪ X=1, 2, 3, 4, disable this port. ▪ X=5, disable all the 4 ports.	DigitAudio OFF with [x]
/+[Y]/[X]:******.	Set communication between PC and HDBaseT receiver. 1. Y is for the RS232 port (connect with RS232 port of the HDBaseT receiver) ▪ Y= 1~5 or A~H, The value of Y is defined into the following meanings (for a given baud rate based on the value of X): ▪ Y = 1~4, send this command to the corresponding HDBaseT receiver to control a far-end device. ▪ Y = 5, send this command to all HDBaseT receivers to control all far-end devices. ▪ Y = A, B, C, or D ▪ Y = E, F, G, or H For items c or d, send this command, it will be saved to the matrix switcher but taken without action to the corresponding HDBaseT receiver. It's command function will be completed synchronously when the command PWON (for item c) or PWOFF (for item d) is sent. Note: A & E are for port 1. B & F are for port 2. C & G are for port 3. D & H are for port 4. 2. X is for baud rate, its value ranges from 1 to 7 (1--2400, 2--4800, 3--9600, 4--19200, 5--38400, 6—57600, 7--115200) 3. ***** is for data (max 48 Byte)	******
EDIDH[x]B[y].	Input port [y] learns the EDID from output port [x]. If the EDID data is available and the audio section supports not only PCM mode, then force-set it to support PCM mode only. If the EDID data is not available, then set it as initialized EDID data.	EDIDH[x]B[y]
EDIDPCM[x].	Set the audio section of input port [x] to PCM format in EDID database.	EDIDPCM[x]
EDIDG[x].	Get EDID data from output [x] and display the output port number.	Hexadecimal EDID data and carriage return character
EDIDMInit.	Restore the factory default EDID data of every input.	EDIDMInit.
EDIDM[X]B[Y].	Manual EDID switching. Enable input[Y] to learn the EDID data of output[X]. If the EDID data is not available, then set it as initialized EDID data.	EDIDM[X]B[Y]
EDIDUpgrade[x].	Upgrade EDID data via the RS232 port. [x] is the input port, when the value of X is 9, this will upgrade all input ports. When the switcher receives the command, it will show a message to prompt you to send an EDID file (.bin file). Operations will be canceled after 10 seconds. Please disconnect all HDBaseT ports.	Please send the EDID file
EDID/[x]/[y].	Set the EDID data of input port [x] to built-in EDID No.[y]. [y]=1~5, correspond to the 5 embedded EDID data separately	EDID/[x]/[y]

Command	Function	Feedback Example
UpgradeIntEDID[x].	Upgrade one of the 5 embedded EDID data, x is the serial number for the EDID data: 1. 1080P 2D 2CH 2. 1080P 3D 2CH 3. 1080P 2D Multichannel 4. 1080P 3D Multichannel 5. 3840x2160 2D (30Hz) When the matrix receives the command, it will show a message to send EDID file (.bin file). Operations will be invalid after 10 seconds.	Please send the EDID file
GetIntEDID[x].	Return the embedded EDID data selection x, [x]=1~5	
GetInPortEDID[X]	Return the EDID data of input [x], [x]=1~4	
%0801.	Auto HDCP management, activate carrier native mode	%0801
%0900.	Switch to carrier native mode.	Carrier native
%0901.	Switch to force carrier mode.	Force carrier
%0911.	Reset to factory default.	Factory Default
%9951.	Check the command sent by port 1 when PWON.	Port 1:data when PWON
%9952.	Check the command sent by port 2 when PWON.	Port 2:data when PWON
%9953.	Check the command sent by port 3 when PWON.	Port 3:data when PWON
%9954.	Check the command sent by port 4 when PWON.	Port 4:data when PWON
%9955.	Check the command sent by port 1 when PWOFF.	Port 1:data when PWOFF
%9956.	Check the command sent by port 2 when PWOFF.	Port 2:data when PWOFF
%9957.	Check the command sent by port 3 when PWOFF.	Port 3:data when PWOFF
%9958.	Check the command sent by port 4 when PWOFF.	Port 4:data when PWOFF
%9961.	Check the system lock status.	System Locked/ Unlock!
%9962.	Check the power status	STANDBY/PWOFF/ PWON
%9963.	Check the working mode for the infrared carrier.	Carrier native/ Force carrier
%9964.	Check the unit IP address.	IP:192.168.0.178 (default)
%9971.	Check the connection status of the inputs.	In 01 02 03 04 Connect Y Y Y Y
%9972.	Check the connection status of the outputs.	Out 01 02 03 04 Connect Y Y Y Y
%9973.	Check the HDCP status of the inputs.	In 1 2 3 4 HDCP N N N N
%9974.	Check the HDCP status of the outputs.	Out 1 2 3 4 HDCP N N N N
%9975.	Check the I/O connection status.	Out 01 02 03 04 In 04 04 04 04
%9976.	Check the output resolution.	Out 1 1920x1080 Out 2 1920x1080

Command	Function	Feedback Example
		Out 3 1920x1080 Out 4 1920x1080
%9977.	Check the status of digital audio for output channels.	Out 1 2 3 4 Audio Y Y Y Y
%9978.	Check the HDCP compliance status of the inputs.	In 01 02 03 04 HDCPEN Y Y Y Y
I-Lock[X].	Lock the channel [x], X=1~4	Channel[x] Lock!
I-UnLock[X].	Unlock the channel [x], X=1~4	Channel[x] Unlock!
A-Lock.	Lock all channels	
A-UnLock.	Unlock all channels	
Lock-Sta.	Check the lock status of all channels.	Channel 1->1 Lock! Channel 1->2 Lock! ..... Channel 2->1 Unlock! .....

5.3 TCP/IP Control

Besides IR control and RS232 control, the Matrix Switcher boasts a TCP/IP port for IP control.

Default settings: IP: 192.168.0.178; Subnet Mast: 255.255.255.0; Gateway: 192.168.0.1; TCP Port: 4001.

The IP & gateway can be changed to suit network requirements, the TCP Port cannot be changed.

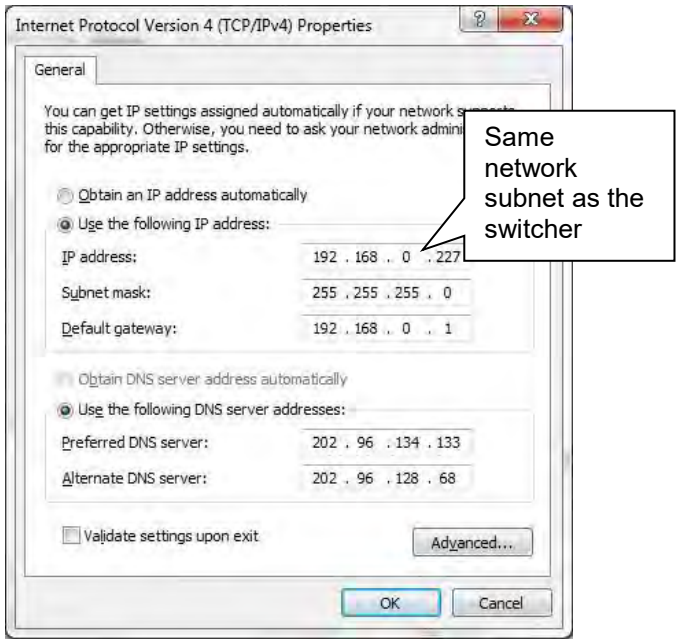
Connect the Ethernet port of the control device and the TCP/IP port of the Matrix Switcher, and set same network subnet for the 2 devices, users are then able to control the device via the web-based GUI or TCP/IP communication software.

5.3.1 Control Modes

The Matrix Switcher can be controlled by PC without Ethernet access or PC(s) within a LAN.

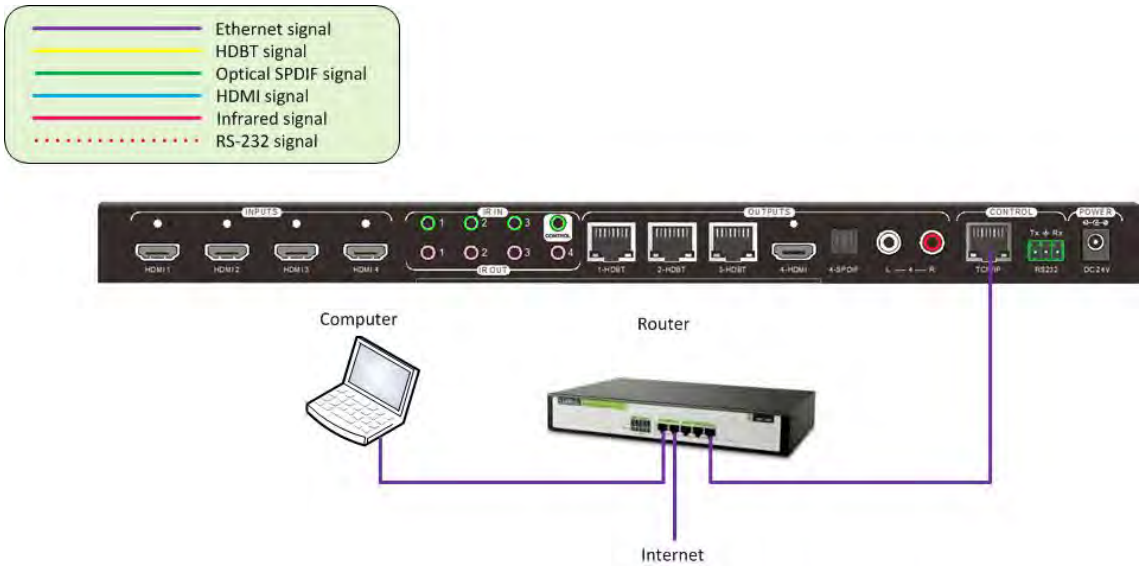
- **Controlled by PC**

Connect a computer to the TCP/IP port of the Matrix Switcher, and set its network subnet to the same as the Matrix Switcher's.



- **Controlled by PC(s) in LAN**

Connect the Matrix Switcher, a router and several PCs to setup a LAN (as shown in the following figure). Set the network subnet of the Matrix Switcher to the same as the router's, then PCs within the LAN are able to control the Matrix Switcher.



Follow these steps to connect the devices:

Step1. Connect the TCP/IP port of the Matrix Switcher to an Ethernet port of PC with twisted pair.

Step2. Set the PC's network subnet to the same as the Matrix Switcher's. Please remember the PC's original network subnet.

Step3. Set the Matrix Switcher's network subnet to the same as the router.

Step4. Set the PC's network subnet back to the original.

Step5. Connect the Matrix Switcher and PC(s) to the router. PC(s) within the LAN are then able to control the Matrix Switcher asynchronously.

The PC's are now able to control the device via GUI.

5.3.2 GUI for TCP/IP control

The 4K Home Distribution Matrix Kit comes with a built-in GUI for convenient TCP/IP control. GUI allows users to interact with this Matrix through graphical icons and visual indicators.

Type *192.168.0.178* in your browser, it will enter the log-in interface as shown below:

There are 2 selectable usernames – admin (default password: admin) and user (default password: user). Logging in as the administrator allows access more configuration interfaces than a standard user. Here is a brief introduction to the interfaces.

Main: Interface shown after logging in, provides intuitive I/O connection status and selection. See the screenshot below:

The button matrix displays every possible connection between every input and output, users can select the connections by clicking buttons.

Buttons 1~9 at the right-bottom corner provide quick save and recall presets.

Users: Display or modify credential settings, front panel lock, and GUI version.

If modified, press Save to store the settings, or press Cancel to leave unchanged.

Interface: Set title bar label and button labels, press Save to save the settings

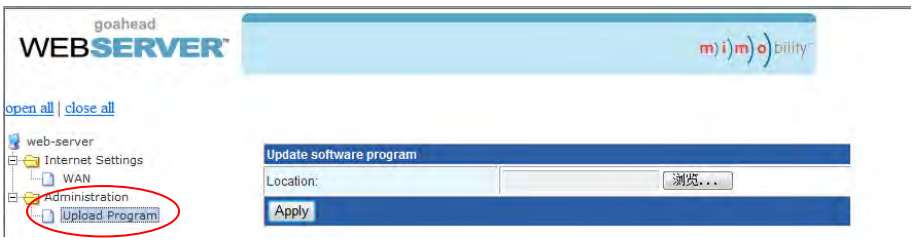
Configuration: Set HDCP Compliance status for every input, and manage EDID. See the screenshot below:

Network: Query and configure network settings including MAC address, IP address, subnet mask, and Gateway

Note: Log in as user to access the main interface.

5.3.3 GUI Update

The GUI for the 4K Home Distribution Matrix Kit supports online updates at *http://192.168.0.178:100*. Type the username and password (the same as the GUI log-in settings, the modified password will be available only after rebooting) to log into the configuration interface. Click Administration at the source menu to get to **Upload Program** as shown below:



Select the desired update file and press Apply, updating will then commence.

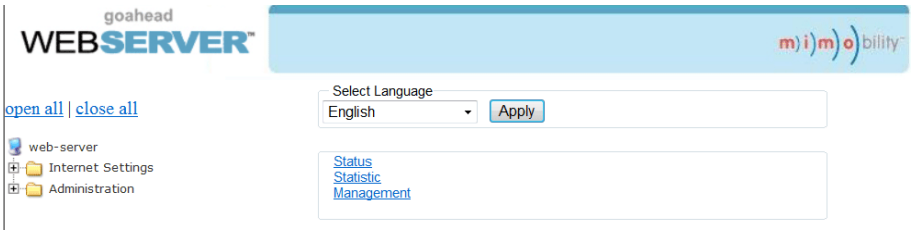
5.3.4 TCP/IP Configuration

IP address, subnet mask, and the Gateway of AVG-CS4K-44 V2 can be modified via the GUI from the above description, beyond that users can configure the IP port, including IP reset, password reset, and IP module firmware update using the Webserver.

Type the Webserver address (Default: *192.168.0.178:100*, changeable) in your browser. Enter the correct username and password to log into the Webserver:

Username: admin; **Password**: admin

Here is the main configuration interface of the Webserver:

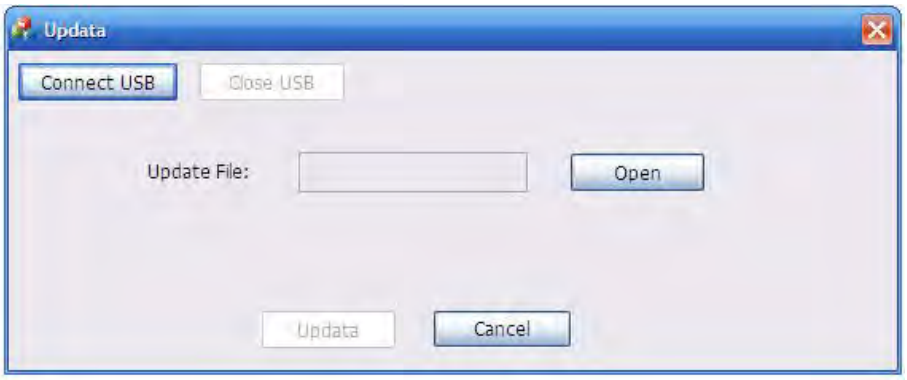


5.4 Firmware Upgrade through the USB port

The Matrix Switcher has a USB port for online firmware upgrades on the front panel. Follow these steps to upgrade the firmware:

Step1. Copy the upgrade software and the latest upgrade file (.bin) to the PC.
Step2. Connect the USB ports of the Matrix Switcher and the PC via a USB cable.
Step3. Double-click the update software icon (see as below).

It will enter the upgrade interface shown as below:



Step4. Click **Connect USB**.
Step5. Click **Open** to load the upgrade file, then click **Updata** to start the firmware upgrade.

Note: To ensure communication, the COM number of the PC should be 1~9.

6. Specifications

6.1 4K HDBaseT Matrix Switcher

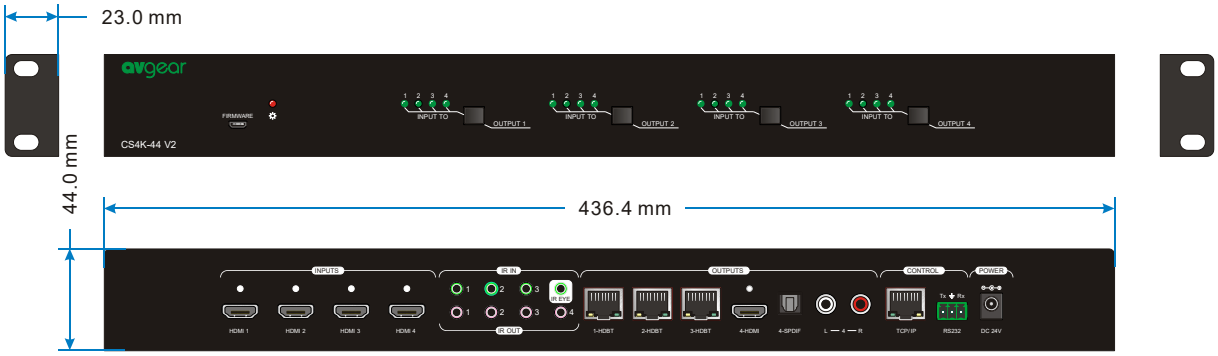
Video Input	
Input	4 HDMI
Input Connector	Female HDMI
Input Level	T.M.D.S. 2.9V~3.3V
Input Impedance	100Ω (Differential)
HDMI Standard	Supports HDMI 1.4 & HDCP 2.2 and is backwards compatible with all previous standards.
Video Output	
Output	1 HDMI – 3 HDbaseT
Output Connector	Female HDMI; Female RJ45(with LED indicators)
Output Level	T.M.D.S. 2.9V~3.3V
Output Impedance	100Ω (Differential)
HDMI Standard	Supports HDMI 1.4 & HDCP 1.4 and is backwards compatible with all previous standards.
Video general	
Video Signal	HDMI (or DVI-D)
Transmission Distance	1080P@60Hz ≤70m; 4Kx2K@60Hz ≤40m
Resolution Range	Up to 4Kx2K@60Hz
EDID Management	In-built EDID data and manual EDID management
Gain	0 dB
Bandwidth	10.2Gbit/s
Switching Speed	200ns (Max.)
Audio general	
Output Signal	Stereo audio; Digital audio
Analog Audio Output	Supports PCM
Digital Audio Output	Supports PCM，Dolby，DTS，DTS-HD
Frequency Response	20Hz~20KHz
Output Connector	1 L&R(RCA); 1 SPDIF
Control	
Control Ports	4 IR OUT; 3 IR IN ; 1 IR CONTROL; 1 TCP/IP (female RJ45); 1 RS232 (3-pin pluggable terminal block)
Panel Control	Front panel buttons
RS232 Control	3-pin pluggable terminal block
IR	Extended IR receiver
TCP/IP Control	Web-based GUI
General	
Power Supply	Input: 100-240V~, 50/60Hz; Output: DC 24V 2.71A
Power Consumption	35W (Max)
Temperature	0~ +50℃
Relative Humidity	10% ~ 90%
Dimension (W*H*D)	436.4mm x 44.0mm x 150.0 mm
Net weight	910g

6.2 HDBaseT Receiver

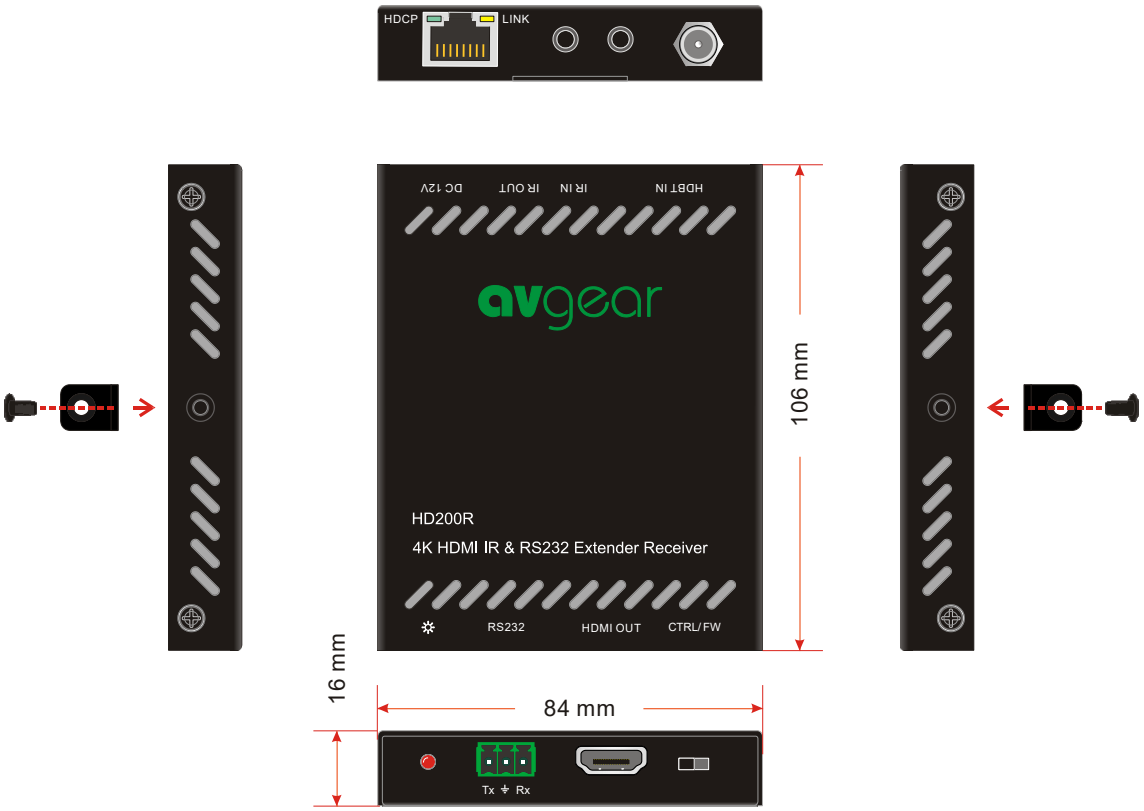
Input & Output	
Input	HDBT IN
Output	HDMI OUT
Control	IR IN, IR OUT, RS232
General	
Maximum Video Resolution	4K×2K@60Hz 4:2:0, including 1080p@60Hz
Transmission Mode	HDBaseT
Transmission Distance	1080p signal to 70m, 4K signal to 40m
Bandwidth	10.2Gbps
Video Standard	HDMI1.4 with HDCP2.2
Power Consumption	10 watts
Operating Temperature	0 ~ +40℃
Storage Temperature	-10 ~ +55℃
Operating Humidity	0% ~ 90%
Power Supply	Input Power: 12VDC 1A or Power over Cable (PoC); AC Adaptor Input Power: 100~240VAC, 50/60Hz
Dimension (W*H*D)	106mm x 16mm x 84mm
Net Weight (g)	250g

7. Panel Drawing

7.1 4K HDBaseT Matrix Switcher



7.2 HDBaseT Receiver



8. Troubleshooting & Maintenance

Problems	Potential Causes	Solutions
Colour loss or no video signal output	The connected cables may not be connected correctly or faulty	Check whether the cables are connected correctly and in working condition
	Failed or loose connection	Make sure the connection is secure
No output image when switching	No signal at input or output	Check with oscilloscope or multimeter if there is any signal at the input/output
	Failed or loose connection	Make sure the connection is secure
	Input source contains HDCP while the HDCP compliance is switched off	Send command /%[Y]/[X]:1. or change the HDCP compliance status in the GUI
	The display doesn't support the input resolution	Switch to another input source or enable the display to learn the EDID data of the input
Cannot control the device via the front panel buttons	Front panel buttons are locked	Send command /%Unlock, or select unlock in the GUI interface to unlock
Cannot control the device via the IR remote	The battery has depleted	Replace battery
	The IR remote is faulty	Send it to an authorized dealer for repair
	Unit is beyond the effective range of the IR signal or not pointing directly at the IR receiver	Adjust the distance and angle and point at the IR receiver
	The IR receiver connected to IR IN port does not contain IR carrier	Change to an IR receiver with carrier
Power Indicator remains off when powered on	Failed or loose power connection	Check whether the cables are connected securely
EDID management does not work normally	The HDMI cable is broken at the output end	Change to another HDMI cable which is in good working condition
There is a blank screen on the display when switching	The display does not support the resolution of the video source	Manage the EDID data manually to make the resolution of the video source identical to the output resolution
Cannot control the unit with the control device (e.g. a PC) through the RS232 port	Wrong connection	Check to ensure the connection between the control device and the unit
	Wrong RS232 communication parameters	Enter the correct RS232 communication parameters: Baud rate:9600, Data bit: 8, Stop bit: 1, Parity bit: none
	Faulty RS232 port	Send it to an authorized dealer for repair