4K HDMI KVM USB/RS232/IR/Analog Audio CAT5e Extender over IP Series
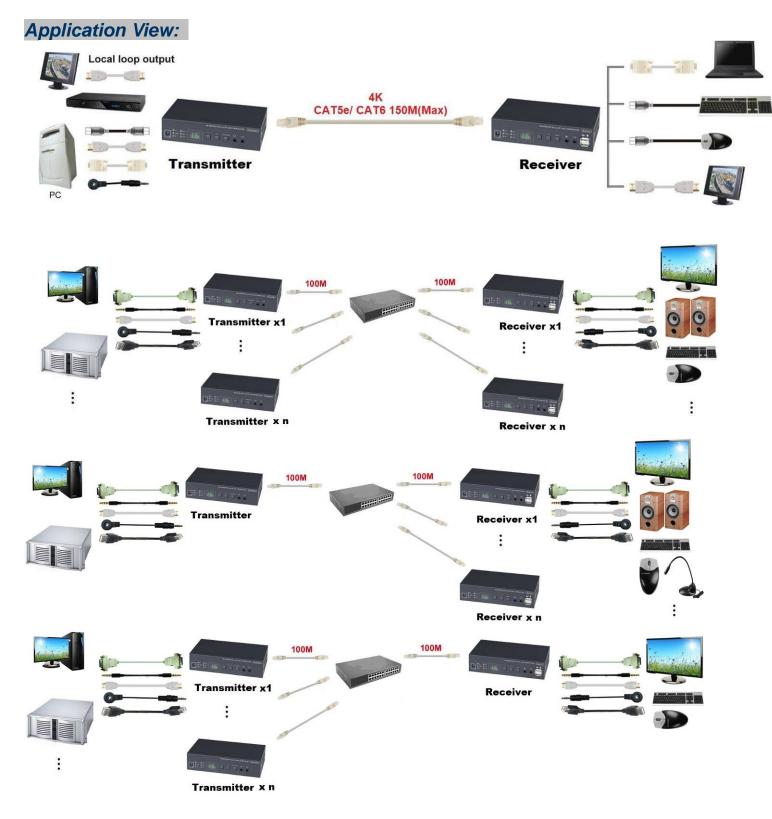
ITEM NO:
HKM02BT-4K: 4K HDMI KVM over IP/Fiber - Transmitter
HKM02BR-4K: 4K HDMI KVM over IP/Fiber – Receiver
HKM02BPT-4K: 4K HDMI KVM over PoE - Transmitter
HKM02BPR-4K: 4K HDMI KVM over PoE – Receiver
HKM02BT: 1080p HDMI KVM over IP - Transmitter
HKM02BR: 1080p HDMI KVM over IP – Receiver

Features:

- Extend and distribute 4K HDMI signal with USB, bi-directional RS232/IR, and analog audio signals over LAN.
- Supports resolutions up to 4K@30Hz Ultra HD.
- HDCP 2.2 compliant.
- Transmission range up to 150M over CAT5e/CAT6.
- Support SFP optical transceiver, single mode transmission distance up to 60KM.
- Support Windows based management software, using PC for easy setting input/output link.
- Support Android/iOS APP for channel select and management.
- Support IR remote control or front panel button for channel select and management.
- Support up to 8x16 video wall.
- Support output resolution up/down scale: 2160p 30Hz input to 1080p 60Hz output.
- Supports full duplex Bi-Directional RS232 communication (115200 MAX) by control software on a PC, or other automated control system to control devices attached to the extenders.
- Built in RS232 distribution function, to send RS232 signal from one TX to multiple RX.
- RS232 port support external Keypad/Console control. (Custom made available)
- Support Dolby TrueHD®, and DTS-HD Master™ ,LPCM audio up to 7.1 channels 192Khz
- Built in Bi-Directional analog audio transmission (only in unicast mode).
- Built in Bi-Directional IR extension.
- HKM02BT-4K and HKM02BPT-4K Transmitter unit built in HDMI local loop output.
- HKM02BR-4K and HKM02BPR-4K Receiver unit with 4 ports USB devices (2 port USB 1.1 front & 2 Port USB 2.0 rear), to extend USB peripheral devices, such as flash disk, hard disk, keyboard, mouse, etc.
- HKM02BPT-4K and HKM02BPR-4K support both 802.3af and power adaptor as power input.
- Use IGMP and Jumbo frame protocol Gigabit Switch Hub to do HD signal distribution and transmission.
- Support point to point and multiple source devices to multi-display connections via Gigabit network switch with Unicast or Multicast mode.
- Support total of transmitter unit up to 1000 pieces, receiver unit over 60000 pieces based on the number of ports on your network switch.
- Perfect for large scale remote HD content access and security monitoring systems, digital signage applications.
- Option Model: 1U 19" Rack Mounting Panel
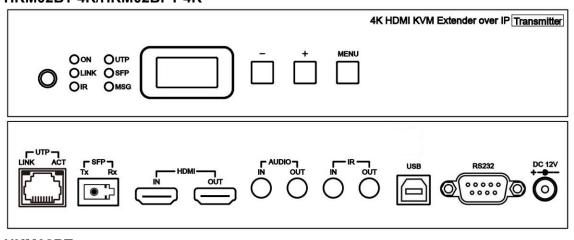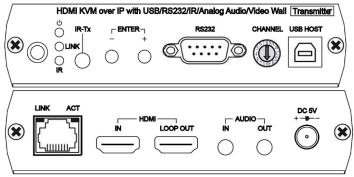 TPN002BT: to fit 2 pcs HKM02BT-4K.   TPN003BT: to fit 3 pcs of HKM02BT.

Local loop output

4K
CAT5e/ CAT6 150M(Max)

Transmitter

Receiver

PC

100M **100M**

Transmitter x1 **Receiver x1**

Transmitter x n **Receiver x n**

100M **100M**

Transmitter **Receiver x1**

Receiver x n

100M **100M**

Transmitter x1 **Receiver**

Transmitter x n

HDMI, DVI, VGA MATRIX over IP

Support Video Wall

Support 4K HDMI

1 Handycam
2 Handycam
3 BD
4 BD
5 Media player
6 Game
7 PC
8 PC
9 NB

HDMI
DVI
VGA

LAN
Gigabit Ethernet Switch

CAT5e 100M (Max) CAT5e 100M (Max)

APP Control

Transmitter x 256 **Receiver x 60000**

RoHS CE FC

Transmitter
HKM02BT-4K/HKM02BPT-4K

4K HDMI KVM Extender over IP | Transmitter

ON UTP
LINK SFP
IR MSG

— + MENU

UTP
LINK ACT — SFP — — AUDIO — — IR —
Tx Rx — HDMI — IN OUT IN OUT USB RS232 DC 12V
IN OUT + −

HKM02BT

HDMI KVM over IP with USB/RS232/IR/Analog Audio/Video Wall | Transmitter

IR-Tx — ENTER — RS232 CHANNEL USB HOST
LINK − +
IR

LINK ACT — HDMI — — AUDIO — DC 5V
IN LOOP OUT IN OUT + −

Receiver
HKM02BR-4K/HKM02BPR-4K

4K HDMI KVM Extender over IP | Receiver

AUDIO OUT
KEYBOARD MOUSE

ON UTP
LINK SFP
IR MSG

— + MENU

MIC IN

UTP
LINK ACT — SFP — USB
Tx Rx HDMI — IR — RS232 DC 12V
OUT IN OUT + −

HKM02BR

HDMI KVM over IP with USB/RS232/IR/Analog Audio/Video Wall | Receiver

IR-Rx IR-Tx — ENTER — 1 2 3 4
LINK − +
IR

LINK ACT — AUDIO — RS232 DC 5V
HDMI OUT IN + −

Panel Button Function:

HKM02B-4K/HKM02BP-4K

Button	-	+	Menu
Short Press	Reduce Value	Increase Value	
Press together	Enter		Menu/Cancel
Press 3 seconds	Carry	Decomposition	
Press 6 seconds			Lock/Unlock Button(When no OSD menu)
Press and hold then power on	Factory Default	Engineering Mode	Set Factory Default then enter Engineering Mode

HKM02B

Button	-	+	- and + together
Short Press	Reduce Value	Increase Value	Enter
Press 3 seconds	Carry	Decomposition	Menu/Cancel
Press 6 seconds			Lock/Unlock Button(When no OSD menu)
Press and hold then power on	Factory Default	Engineering Mode	Set Factory Default then enter Engineering Mode

In engineering mode Power and Link LED will be flash together, IP address of unit will be set to Static IP 192.168.0.88 temporarily, users can login to the web page by browser to change settings or update firmware.

Rotary Switch Function: (HKM02BT only)

HKM02BT Transmitter built in rotary switch to set channel numbers follow 16 HEX, could switch " 0 ~ F " total 16 channels, A = channel 10, B = channel 11, others channel same as 16 hex conversion.
For channel numbers over 15 you could use panel button, IR remote, RS-232, APP to set up.

Front Panel LED Indication Status:

Panel LED	Status	HKM02B-4K	HKM02B
Power Green LED	On	Boot completed	
	Flash Twice	Booting	
	Flash Slowly	Transmitter: standby(by IR remote power button only) Receiver: video output be turned off	
	Breathing(Fading)	Screen saver mode (not available for transmitter)	
Link Blue LED	On	Connected & video is streaming	
	Flash	Connecting, or no source input from transmitter	
IR Red LED	On	Transmitting /receiving IR signal	
	Flash		System warring, Alert
UTP Green LED	On	Connected by UTP RJ45 port	
	Flash	Transmitting /receiving data from UTP RJ45 port	
SFP Blue LED	On	Connected by Fiber SFP port	
	Flash	Transmitting /receiving data from Fiber SFP port	
MSG Red LED	On	Other message (IR, RS232, System setting…)	
	Flash	System warring, Alert	

System Warring, Alert LED Indication Status:

Times	HKM02B-4K MSG LED	HKM02B IR LED
Always ON	IR control, RS232 control, system setting	Transmitting/receiving IR signal
2	Transmitters channel conflict	
3	DHCP server not found	
4	Rest to factory default	
5	Engineering mode	
6	Manufacture setting mode	
7	Aux system stopped	
8	Aux system firmware boot sector error	
9	Aux system firmware type error	

RJ45 LED Indication Status:

RJ45 LED	Status	Description
LINK Green LED	On	Ethernet connected
ACT Orange LED	Flash	Data transmission

RJ45 pin define:

Link Cable (TIA/EIA-568-B)

1. Orange-white	Data 1 +	5. Blue-white	Data 3 -
2. Orange	Data 1 -	6. Green	Data 2 -
3. Green-white	Data 2 +	7. Brown-white	Data 4 +
4. Blue	Data 3 +	8. Brown	Data 4 –

Cable & Transmission Distance:

Link Cable use high quality CAT.5e UTP/STP/FTP or CAT.6 UTP cable

Transmission distance will be affected by equipment (Switch HUB), cable quality…etc.

When using CAT.5e/CAT.6 cable connect transmitter and receiver directly without Ethernet switch, the maximum transmission distance up to 150M.

You can also use model no: SR01 repeater for extended longer distance or using Gigabit Switch hub which support **IGMP** protocol and **Jumbo Frame 8K** for signal distribution or extend distance.

System Default Settings:

Transmitter / receiver support **Unicast** and **Multicast** two mode, default is Multicast.

In Multicast mode it could be one to one, one to multi, multi to on or multi to multi applications.

The analog audio output of transmitter and input of receiver will be off in this mode, analog audio only from transmitters send to receivers.

Unicast mode suitable for one to one or multiple transmitters to one receiver applications.

Analog audio bi-direction transmission only in **Unicast** mode.

System default IP setting is **Auto IP**, it will assign **169.254.X.X** (submask **255.255.0.0**) to transmitters and receivers, you could also set to DHCP or Static IP, please refer to web setting chapter: IP Setup.

We recommend DHCP or Static IP mode in mass deployment to prevent IP conflict problem.

Bandwidth Chart:

The bandwidth will be varied based on different resolution.   Higher resolution may not request bigger bandwidth. Below Chart is the resolution and bandwidth status for reference.

Resolution (@60Hz)	Average Bandwidth (Mbps)	Resolution (@60Hz)	Average Bandwidth (Mbps)
3840x2160 (2160p)	218 (146~268)	1280x1024 (SXGA)	113 (79~150)
1920x1080 (1080p)	133 (80~210)	1024x768 (XGA)	81 (72~120)
1280x720 (720p)	147 (112~177)	800x600 (SVGA)	66 (49~82)
1600x1200 (UXGA)	81 (57~105)	640x480 (VGA)	43 (29~56)

Above bandwidth chart not include USB transmission, it cost up to 50 Mbps when transferring mass data.

System scalability is limited only by uplink and stacking connector bandwidths, for example under Gigabit Ethernet network, the total flow must not exceed 1000Mbps to avoid any delay on video streaming. If the video play with 1080p resolution, the transmitter allow maximum up to 7 pcs for simultaneous video streaming.

For 8~16 sources: use switches which support 802.3ad Link Aggregation or smart (or intelligent) switches to get 2 Gbps or more bandwidth.

For over 16 sources: use switches which support SFP+ uplink or stackable switches to get 10 Gbps bandwidth.

USB Hot Key Function:

In multicast mode support multi USB keyboard and mouse in each receivers, just plug and play, but only one USB FLASH drive / hard disk could be used at same time.

You have to click "Pause/Break" key three times of the keyboard on the receiver or IR remote MENU function 14 to establish USB FLASH drive /hard disk connection.

Remote Control Function:

You could use the IR infrared remote control to preset channel selection. Using the IR remote control aim to the front panel of receiver or external IR receiver cable will be ok.

Initial at first time use the remote control or after change battery of remote control, the IR remote control and the equipment Remote ID must be using same ID. The default Remote ID for transmitter is 7, for receiver is 8.

To setting the Remote ID, Press and hold power button, then press button 8 to complete the setting. (power) + (8).(for example)

Remote Control Button Function:

Symbol	Button	Receiver Function	Transmitter Function
(power)	POWER	Turn Off/On Video Output	Connect/Disconnect Receiver
		Setup Remote Control ID	
(MENU)	MENU	Menu selection, input numbers after press menu button	
(△)	UP	Increase Value	
(▽)	DOWN	Reduce Value	
(◁)	LEFT	Carry	
(▷)	RIGHT	Decomposition	
(ENTER)	ENTER	Enter / Show Channel Information (When no other Menu operation)	Enter
(✳)	ASTERISK	Cancel	
(#)	NUMBER	Recall Previous Value	
(A)	A	Favorite Channel Switching	Not Available
(B)	B	Back to Previous Channel	
(1)	1	Number 1	
(2)	2	Number 2	
(3)	3	Number 3	
(4)	4	Number 4	
(5)	5	Number 5	
(6)	6	Number 6	
(7)	7	Number 7	
(8)	8	Number 8	
(9)	9	Number 9	
(0)	0	Number 0	

Remote Control Operation:

Select Channel:
> Mode 1: use ◀ or▲ or ▼or ▶ to select channel and press **ENTER** to confirm.
> Mode 2: enter the channel number and press **ENTER** to confirm the input channel.

Select Menu Function:
> Mode 1: press **MENU** then use ◀ or ▲ or ▼ or ▶ to select function, press **ENTER** to confirm.
> Mode 2: press **MENU**, then input function number as below, press **ENTER** to confirm.

Wake Up Receiver:
> Receiver will enter screen saver mode after 30 seconds if no video input, you could press any button of IR remote or pane to wake up

Turn On/Off Monitor:
> Press **POWER** of IR remote or panel button **CH-** and **CH+** together to turn on video output

IR Quick Block:
> **# # #**: IR block mode, ignore IR control signal until press any panel button or IR remote * three times
> *** * ***: Quit IR block mode

TV Wall Quick Switch:
> **MENU+POWER**: IR quick block mode, ignore IR control signal until press any panel button or IR remote * * *

Add Favorite List:
> **MENU+A**: Add channel to favorite list in menu, maximum 32 channels.

Remove Favorite List:
> **MENU+B**: Remove current channel from favorite list in menu

Transmitter RS232 Mode:
> **MENU+A**: Switch to message mode to receive response instead of OSD.
> **MENU+B**: Switch to extender mode.

Menu Function List:

No.	Menu	Description	Option / Remark	RX	TX
0	System Information	System Information		V	V
1	Network Information	Network Information		V	V
2	Function Information	Function Information		V	V
3	Control Information	Control Information		V	V
4	Video & Audio Information	Video & Audio Information		V	V
5	RS-232 Control Information	RS-232 Control Information		V	V
6	Channel Information	Channel Information		V	X
7	Favorites Information	Favorites Information		V	X
8	Routing Information	Routing Information		V	X
9	Video Wall Information	Video Wall Information		V	X
10	Advanced Menu	Display advance menu	0 = Hide 1 = Display	1	1
11	Reconnection	Reconnect with TX/RX		V	V
12	Disconnection	Disconnection (keep routing channel)		V	X
13	Stop Connection	Stop all connection (Include routing channel)		V	V
14	Starting USB	Get USB control priority (in multicast mode only)		V	X
15	Casting Mode	Casting Mode setting	0 = Unicast 1 = Multicast	1	1
16	Jumbo Frame	Jumbo Frame setting	0 = Disable 1 = Enable	1	1
17	Free Routing	Free Routing setting		1	1
20	Video Function	Video Extender setting		1	1
21	Audio Function	Audio Extender setting		1	1
22	USB Function	USB Extender setting		1	1
23	RS-232 Function	RS-232 Extender setting	0 = Disable 1 = Enable	1	1
24	IR Function	IR Extender setting		1	1
25	Video Wall Function	Video Wall setting		1	1
26	CEC Function	CEC setting (4K only)		1	1
27	GPIO Function	GPIO setting (OEM only)		0	0

No	Setting	Description	Options		
30	Button Control	Button Control setting	0 = Disable 1 = Enable	1	1
31	Button Lock	Button Lock		0	0
32	IR Control	IR Control setting		1	1
33	IR Control ID	IR Control ID setting	0 ~ 9 = IR Control ID 10 = User Define Controller	8	7
34	RS232 Control	RS232 Control setting	0 = Disable 1 = Enable (Case Sensitive) 2 = Case Insensitive	1	1
35	HDMI 5V Control	Cut HDMI 5V when switching	0 = Disable 1 = Enable	0	X
36	CEC Control	Turn off TV by CEC (4K only)		0	X
40	Video Select	Video output resolution setting	0=Pass-Through 1=HD 720p 60Hz, 2=Full HD 1080p 60Hz 3=Full HD 1080p 50Hz 4=Ultra HD 2160p 30Hz 5=Ultra HD 2160p 25Hz 6=WXGA 1366x768 60Hz 7=WXGA+ 1440x900 60Hz 8=WUXGA 1920x1200 60Hz 9=SXGA+ 1400x1050 60Hz 10=Customize	0	X
41	Audio Select	TX Audio Input Select /RX Audio Output Select	0 = HDMI 1 = Analog 2 = Auto	2	2
42	Analog Input Volume	Analog Input Volume	0 = Mute 1 ~ 100 = Volume %	85	85
43	Analog Output Volume	Analog Output Volume		85	85
44	EDID Update	Update EDID from TX or monitor of RX		V	V
45	Video Quality	Video Quality setting	0 = Graphic Mode 1 ~ 5 = Mode 1 ~ 5 6 = Video Mode	X	6
46	Anti-Dither	Anti-Dither setting	0 = Disable 1 ~ 2 = Mode 1 ~ 2	X	0
47	HDCP Always On	HDCP setting	0 = Disable 1 = Enable	0	0
48	HDCP 2.2 Always On	HDCP 2.2 setting		0	0
50	RS-232 Select	RS-232 Port Mode Select	0 = Disable 1 = Extender 2 = Keypad 3 = Auxiliary 4 = Console	1	1
51	RS-232 Baudrate	RS-232 Extender Baudrate	0 = 115200 bps 1 = 57600 bps 2 = 38400 bps 3 = 19200 bps 4 = 9600 bps 5 = 4800 bps 6 = 2400 bps 7 = 1200 bps 8 = 600 bps 9 = 300 bps	0	0
52	RS232 Newline	RS232 Control Newline setting	0 = Linux (0x0A) 1 = Windows (0x0D, 0x0A) 2 = Mac (0x0D) 3 = Other (0x0A, 0x0D)	1	1
53	RS232 Trigger	RS232 Control Trigger setting		1	1
54	Auxiliary Baudrate	Auxiliary Baudrate	0 = 115200 bps 1 = 57600 bps 2 = 38400 bps 3 = 19200 bps 4 = 9600 bps 5 = 4800 bps 6 = 2400 bps 7 = 1200 bps 8 = 600 bps 9 = 300 bps	0	0
55	Auxiliary Newline	Auxiliary Newline setting	0 = Linux (0x0A) 1 = Windows (0x0D, 0x0A) 2 = Mac (0x0D) 3 = Other (0x0A, 0x0D)	1	1
56	Auxiliary Trigger	Auxiliary Trigger setting		1	1
57	Device No	Device No. for RS232 control	0 ~ 999	0	X
58	Group No	Group No. for RS232 control	0 ~ 99	0	X
59	Party No	Party No. for RS232 control		0	X

No.	Name	Description	Value		
60	Fast Switch	Switch without stop link	0 = Disable	0	0
61	Conflict Check	Check existing TX channel	1 = Enable	X	1
62	Channel Name	Display Channel Name	0 = Hide 1 = Display	0	X
63	Only Favorites	Only Favorites Channel Available	0 = Disable 1 = Enable	0	X
64	Lock Favorites	Lock Favorites Channel		0	X
65	Auto Sort Favorites	Auto Sort Favorites Channel		0	X
66	Sort Favorites	Sort Favorites Channel		V	X
67	Scan Channel To Favorites	Scan Channel To Favorites		V	X
70	Direct Access Menu	Run menu function even hide	0 = Disable 1 = Enable	1	1
71	Menu Item "Advanced Menu"	Display/Hide "Advanced Menu"		1	1
72	Screensaver	Screen Saver setting		0	X
73	Screen Off Option	Behavior After Screen Off	0 = No Option 1 = Mute Analog Audio 2 = Stop Connection	1	X
74	Diagnostic Information	Diagnostic Information	0 = Disable 1 = Enable	1	X
75	Message Redirect	Message Redirect to Auxiliary		X	1
76	Command Redirect	Command Redirect to Auxiliary		1	1
80	Video Routing	Video Routing setting	0 ~ 999 = Specific Channel 1000=Follow Channel	1000	X
81	Audio Routing	Audio Routing setting		1000	X
82	USB Routing	USB Routing setting		1000	X
83	RS-232 Routing	RS-232 Routing setting		1000	X
84	IR Routing	IR Routing setting		1000	X
85	GPIO Routing	GPIO Routing setting		1000	X
86	Load Routing Mapping	Load Free Routing Mapping	0~4	V	X
87	Save Routing Mapping	Save Free Routing Mapping		V	X
90	Video Wall Max Row	Rows of Video Wall	0~7	0	X
91	Video Wall Max Column	Columns of Video Wall	0~15	0	X
92	Monitor Row Position	Monitor Position in Row	0~7	0	X
93	Monitor Column Position	Monitor Position in Column	0~15	0	X
94	Monitor Outside Width	Outer Width of Monitor	0~65000 (0.1mm)	0	X
95	Monitor Outside Height	Outer Height of Monitor		0	X
96	Monitor Viewable Width	Width of Viewable Area		0	X
97	Monitor Viewable Height	Height of Viewable Area		0	X
100	Stretch Type	Stretch Type	0 = Stretch Out 1 = Fit In	1	X
101	Rotate	Rotation and Mirror	0 ~ 7	0	X
102	Vertical Shift	Vertical Shift	400 = Default 399 ~ 0 = shift up 401 ~ 801 = shift down	400	X
103	Horizontal Shift	Horizontal Shift	400 = Default 399 ~ 0 = shift left 401 ~ 801 =shift right	400	X
104	Vertical Scale	Vertical Scale	0 ~ 255	0	X
105	Horizontal Scale	Horizontal Scale		0	X
200	Backup Setting	Backup Setting to bank 0~4	0 ~ 4	V	V
201	Restore Setting	Restore Setting from bank 0~4		V	V
202	System Setting	System Setting	0~255 (Debug use, no recommend for general users)	V	V
203	Application Setting	Application Setting		V	V
333	Reset To Default	Reset to factory default		V	V
999	System Reboot	System Reboot		V	V

V = Available X = Not available   Numbers = default value

- **Menu 17** Free Routing function only works in Multicast mode, and must be enabled.
- **Menu 25** Display or hide TV wall setting in the webpage.
- **Menu 26** CEC function only available in unicast mode.
- **Menu 20~25** To set select function connect to fix channel, not follow channel switching.
- **Menu 32** To set customize IR remote, need to be import to RX by RS-232 or Telnet command
- **Menu 35** For monitors which detect HDMI 5V to enter sleeping mode.
- **Menu 36** Turn off monitor by CEC command via RX.

- **Menu 40** Customize resolution need to be setup by RS-232 command or web page
- **Menu 44** Use default EDID at TX side, copy monitor EDID at RX side.
- **Menu 47~48** Monitor HDCP version setting, with incorrect HDCP version setting it will show black screen.

HDCP Always On	HDCP 2.2 Always On	Description
Disable	Disable	HDCP version follow source and Stream Type of content
Enable	Disable	Monitor support HDCP 1.4
Don't Care	Enable	Monitor support HDCP 2.2

- **Menu 50** Extender = RS-232 extender, Keypad = for RS-232 keypad or number key in terminal software, Auxiliary = auxiliary mode debug, Console = system console debug
- **Menu 60** Fast Switch mode works best when: resolution, frame rate, scan mode (interlaced/non-interlaced), color depth, color space, interface (HDMI/DVI), HDCP mode (ON/OFF) all above are the same.
  Disable: Stop link before channel switch, is will show black screen between switching, if switch to the channel which not exist it will show diagnostic Information.
  Enable: Keep link when channel switch, if switch to the channel which not exist may cause screen freeze 1~2 seconds then show diagnostic Information.
- **Menu 61** Conflict Check will check existing TX channel number at booting, reconnection or before switching.
- **Menu 62** Channel Name will show full name instead of number only, the position of channel name is center of screen. Channel name can set by RS232 command or import from telnet port.
- **Menu 75** Message Redirect forward MENU message to TX RS232 port (Auxiliary mode) instead OSD.
- **Menu 76** Command Redirect run RS232 command from Web or telnet port (Auxiliary mode).
- **Menu 80~85** Fix selected function not follow the channel, only available when free routing enabled.
- **Menu 90~103** Only available when video wall function enabled..

Keypad Function:
You can use RS-232 Keypad or terminal program with number key to emulate IR remote operation.
Before using RS-232 keypad you have to select Keypad by **Menu 56 RS-232 Select**, and set RS-232 baudrate by **Menu 60 Auxiliary Baudrate.**

Key	Description
0~9	Enter number
+	Increase value
-	Reduce value
. or **#**	Previous value
Enter	Confirm
* or **Esc** or **Clear**	Cancel
/	Call MENU
Press **Clear** four times then press **Enter**	Call MENU

RS-232 Control:

In RS-232 extender mode, user could use RS-232 port of transmitters to operate/setup the receivers at same channel by program like Hyper Terminal which built-in Windows XP and before version.

Hyper Terminal setting: 〔**115200 bps (8-N-1), Flow control: None**〕(Properties -> Settings -> ASCII Setup… and select **"Send line ends with line feeds"** &**"Echo typed characters locally"**)

★**We recommend set the RS232 routing for all receivers to one transmitter to avoid RS232 connection broken by video channel switching.**

Command format: >CMD_Address> Command Parameters
Address, command and parameters are char, not hex code
Enter (LF or CR+LF) is required to execute the command
All accord receivers will run the command and parameters, we also add 3 kinds of user defined numbers except MAC & IP (Device No、Group No、Party No) for flexible application:

Mxxxxxx	The last 6 digits of MAC Address of receiver	e.g.: 2218680123AB = M0123AB
Ixxxx	The last 2 column of IP Address (HEX) of receiver	e.g.: 169.254.012.034 = I0C22
Dxxx	Device No	e.g.: Device No 123 = D123
Gxx	Group No	e.g.: Group No 12 = G12
Pxx	Party No	e.g.: Party No 34 = P34
Cxxx	Channel No	e.g.: Channel 123 = C123
ALL	All receivers	

Response format: <ACK_Address< Response character
Receivers will response message to transmitter as above format and send Newline after
When send command to multiple receivers(address as Gxx, Pxx, Cxxx, and ALL) they will not response.

Command and Parameters List:

Command	Parameters	Description	Remark
CHANNEL	?	Show current channel number	Transmitter not support parameter NAME Receiver not support parameter CHECK
	[0~999]	Switch to specified channel	
	[0~999] NAME ?	Check current channel name	
	[0~999] NAME "string"	Set channel name, 28 character MAX	
	NAME ?	Show channel name setting	
	NAME [ENABLE | DISABLE]	Enable/disable channel name	
	NAME CLR	Clear all channel name	
	NAME IMPORT	Import channel name	
	FAST ?	Status of current fast switch	
	FAST [ENABLE | DISABLE]	Enable/disable fast switch	
	CHECK ?	Status of channel conflict check	
	CHECK [ENABLE | DISABLE]	Enable/disable channel conflict check	
FAVORITE	?	Usage of favorite channel (MAX.32)	Transmitter not support parameter FAVORITE
	ADD	Add current to favorite channel	
	ADD [0~999]	Add specified channel to favorite	
	DEL	Delete current from favorite channel	
	DEL [0~999]	Delete specified channel from favorite	
	CLR	Clear favorite channel list	
	ONLY ?	Status of favorite channel only	
	ONLY [ENABLE | DISABLE]	Enable/disable favorite channel only	
	AUTO ?	Status of auto sort favorite channel	
	AUTO [ENABLE | DISABLE]	Enable/disable auto sort favorite	
	SORT	Sort favorite channel immediately	
VIDEO	FUNC ?	Status of video extension	Transmitter not support parameter ROUTING, SELECT and CUSTOMIZE, RESUME, PAUSE, BLACK Receiver not support parameter QUALITY and DITHER
	FUNC [ENABLE | DISABLE]	Enable/disable video extension	
	ROUTING ?	Status of video routing	
	ROUTING [FOLLOW | 0~999]	Set video routing follow or specified	
	SELECT ?	Status of video output resolution	
	SELECT [0~9 | 10]	Set output resolution, 10=customize	
	CUSTOMIZE ?	Status of customize resolution	
	CUSTOMIZE integer	Set customize resolution	
	QUALITY ?	Status of video quality	
	QUALITY [0 | 1~5 | 6]	Set video quality	
	DITHER ?	Status of video dither	
	DITHER [0 | 1~2]	Set video dither	
	EDID	Update EDID from TX or monitor of RX	
	RESUME	Resume stream	
	PAUSE	Pause stream	
	BLACK	Stop stream and send black screen	
VIDEOWALL	FUNC ?	Status of video wall function	Transmitter support FUNC only
	FUNC [ENABLE | DISABLE]	Enable/disable video wall	
	MODE ?	Status of video wall mode	
	MODE [ENABLE | DISABLE]	Set video wall mode/single mode	
	OW ?	Show outer width of monitor	
	OW [0~65535]	Set outer width of monitor	
	OH ?	Show outer height of monitor	
	OH ? [0~65535]	Set outer height of monitor	
	VW ?	Show width of viewable area	
	VW ? [0~65535]	Set width of viewable area	
	VH ?	Show height of viewable area	
	VH ? [0~65535]	Set height of viewable area	
	MAX_ROW ?	Show maximum row of video wall	
	MAX_ROW 0~7	Set the row 1~8 of video wall	
	MAX_COLUMN ?	Show maximum column of video wall	
	MAX_COLUMN [0~15]	Set the column 1~16 of video wall	
	ROW?	Show position in row	
	ROW [0~7]	Set position in row	
	COLUMN ?	Show position in column	
	COLUMN [0~15]	Set position in column	
	STRETCH ?	Status of stretch type	
	STRETCH [0~1]	Set stretch, 0 = Fit In, 1 = Stretch Out	
	ROTATE ?	Status of rotate type	
	ROTATE [0~7]	Set rotate, 0 = default	
	SHIFT_V	Status of vertical shift	
	SHIFT_V [0~399 | 400 | 401~801]	0~399: up, 400:default, 401~801: down	
	SHIFT_H ?	Status of horizontal shift	
	SHIFT_H [0~399 | 400 | 401~801]	0~399: up, 400:default, 401~801: down	
	SCALE_V ?	Status of vertical scale	
	SCALE_V [0~255]	Set vertical scale	
	SCALE_H ?	Status of horizontal scale	
	SCALE_H [0~255]	Set horizontal scale	
	ENABLE %1_%2_%3_%4	%1 = MAX_ROW, %2 = MAX_COLUMN, %3 = ROW, %4 = COLUMN	
	MONITOR_INFO %1_%2_%3_%4	%1 = VW, %2 = OW, %3 = VH, %4 = OH	

AUDIO	FUNC ?	Status of audio extension	Transmitter not support parameter ROUTING
	FUNC [ENABLE | DISABLE]	Enable/disable audio extension	
	ROUTING ?	Status of audio routing	
	ROUTING [FOLLOW | 0~999]	Set audio routing follow or specified	
	SELECT ?	Status of audio setting	
	SELECT [0~2]	Select audio of TX input/ Rx output	
	IN ?	Status of audio input volume	
	IN [0 | 1~100]	Set audio input volume (%), 0 = Mute	
	OUT ?	Status of audio output volume	
	OUT [0 | 1~100]	Set audio output volume (%), 0 = Mute	
USB	FUNC ?	Status of USB extension	Transmitter not support parameter ROUTING and REQUEST
	FUNC [ENABLE | DISABLE]	Enable/disable USB extension	
	ROUTING ?	Status of USB routing	
	ROUTING [FOLLOW | 0~999]	Set USB routing follow or specified	
	REQUEST	Request USB access (multicast only)	
RS232	FUNC ?	Status of RS232 extension	Transmitter not support parameter ROUTING
	FUNC [ENABLE | DISABLE]	Enable/disable RS232 extension	
	ROUTING ?	Status of RS232 routing	
	ROUTING [FOLLOW | 0~999]	Set RS232 routing follow or specified	
	CTRL ?	Status of RS232 control setting	
	CTRL [0~2]	0=disable, 1=enable, 2=insensitive	
	BAUD ?	Status of baud rate	
	BAUD [0~9]	0=115200, 1=57600, 2=38400… 9=300	
	NEWLINE ?	Status of newline format	
	NEWLINE [0~3]	0=Linux, 1=Windows, 2=Mac, 3=Other	
	TRIGGER ?	Status of trigger	
	TRIGGER [0~3]	0=Linux, 1=Windows, 2=Mac, 3=Other	
IR	FUNC ?	Status of IR extension	Transmitter not support parameter ROUTING
	FUNC [ENABLE | DISABLE]	Enable/disable IR extension	
	ROUTING ?	Status of IR routing	
	ROUTING [FOLLOW | 0~999]	Set IR routing follow or specified	
	CTRL ?	Status of IR control setting	
	CTRL [ENABLE | DISABLE]	Enable/disable IR control	
	ID ?	Status of IR remote ID	
	ID [0~10]	Set IR remote ID	
	KEY [0~32] ?	Status of IR key setting	
	KEY [0~32] = address, command	Set mapping of third party IR remote	
	KEY IMPORT	Import IR key setting	
	BLOCK ?	Status of IR quick block	
	BLOCK [ENABLE | DISABLE]	Enable/disable IR quick block	
CEC	FUNC ?	Status of CEC function	Support 4K model only
	FUNC [ENABLE | DISABLE]	Enable/disable CEC function	
	CTRL ?	Status of CEC control	Transmitter not support parameter CTRL
	CTRL [ENABLE | DISABLE]	Enable/disable CEC control	
BUTTON	CTRL ?	Status of button control	
	CTRL [ENABLE | DISABLE]	Enable/disable button control	
	LOCK ?	Status of button lock	
	LOCK [ENABLE | DISABLE]	Enable/disable button lock	
HDMI	CTRL ?	Status of HDMI 5V control	Transmitter not support parameter CTRL
	CTRL [ENABLE | DISABLE]	Enable/disable HDMI 5V control	
	HDCP ?	Status of HDCP Always On	
	HDCP [ENABLE | DISABLE]	Enable/disable HDCP Always On	
	HDCP 2.2 ?	Status of HDCP 2.2 Always On	
	HDCP 2.2 [ENABLE | DISABLE]	Enable/disable HDCP 2.2 Always On	
SCREEN	?	Status of screen settings	Transmitter not support this command
	[ON | OFF]	Screen on/off	
	SAVER ?	Status of screen saver	
	SAVER [ENABLE | DISABLE]	Enable/disable screen saver	
	OPTION ?	Status of behavior after screen off	
	OPTION [0~2]	Set behavior after screen off	
OSD	ON "string"	Show "string" on screen (30 seconds)	Transmitter not support this command
	OFF	Turn off OSD immediately	
	OFF ?	Status of OSD duration (ms)	
	OFF [0~65535]	Set duration of OSD (ms)	

ROUTING	?	Status of free routing	Transmitter not support parameter LOAD and SAVE
	[ENABLE | DISABLE]	Enable/disable free routing	
	LOAD [0~4]	Load free routing setting	
	SAVE [0~4]	Save free routing setting	
NET	RECONNECT	Reconnect with TX/RX	Transmitter not support parameter DISCONNECT
	DISCONNECT	Disconnection (keep routing channel)	
	STOP	Stop all connection (Include routing channel)	
	MULTICAST ?	Status of multicast	
	MULTICAST [ENABLE | DISABLE]	Disable=unicast	
	JUMBO_FRAME ?	Status of Jumbo Frame	
	JUMBO_FRAME [ENABLE | DISABLE]	Enable/disable Jumbo Frame	
	IP_MODE ?	Status of IP mode	
	IP_MODE [0~2]	0=Auto, 1=static, 2=DHCP	
	IP ?	Status of static IP address	
	IP [xxx.xxx.xxx.xxx]	Set static IP address	
	NETMASK ?	Status of subnet mask (static IP mode)	
	NETMASK [xxx.xxx.xxx.xxx]	Set subnet mask (static IP mode)	
	GATEWAY ?	Status of gateway (static IP mode)	
	GATEWAY [xxx.xxx.xxx.xxx]	Set gateway (static IP mode)	
QUERY	IP	Status of current IP address	
	MAC	Status of MAC address	
	RESOLUTION	Status of video resolution	
	VERSION	Status of firmware version	
AUXILIARY	BAUD ?	Status of auxiliary baudrate	
	BAUD [0~9]	0=115200, 1=57600, 2=38400… 9=300	
	NEWLINE ?	Status of auxiliary newline	
	NEWLINE [0~3]	0=Linux, 1=Windows, 2=Mac, 3=Other	
	TRIGGER ?	Status auxiliary trigger	
	TRIGGER [0~3]	0=Linux, 1=Windows, 2=Mac, 3=Other	
	VERSION	Status of auxiliary versions	
LOAD	DEFAULT	Load default to current setting	When load default the settings will be auto saved
	[0~4]	Load system setting from bank 0~4	
SAVE		Save current system setting	
	[0~4]	Save system setting to bank 0~4	
REBOOT		Reboot	
CONSOLE	string	Run console API command	For debug using, if input incorrect value will cause unpredictable problem, adjust by professional installer only.
SYSTEM	[0~255] ?	Status of system function	
	[0~255]	Set system function	
APPLICATION	[0~255] ?	Status of application function	
	[0~255]	Set application function	

※RS232 command not support backspace, delete or up, down, left, right to modification. If you enter command or parameters with wrong typing, please enter newline and re-enter full command and parameters again.

※Parameters with gray shading means need to reboot to take effect.

※ The maximum of OSD_ON is 30 characters per line, maximum 127 charcters, not support comma sign「,」, colon「:」 and double quotation marks 「"」, some characters must use \x## format to display, ## means the characters number in ASCII HEX code
e.g.: **\x0a** is line feed, **\x28** is **(** brackets sign, **\x22** is **"** sign

Example:
\>CMD_M1234> CHANNEL 12   (Set receiver which last 4 digits MAC Address is 1234 to Channel 12)
(HEX code: 3E 43 4D 44 5F 4D 31 32 33 34 3E 20 43 48 41 4E 4E 45 4C 20 31 32 0D 0A)

<ACK_M1234< OK   (Receiver which last 4 digits MAC Address is 123456 response "OK")
(HEX code: 3C 41 43 4B 5F 4D 31 32 33 34 3C 20 4F 4B 0D 0A)

\>CMD_I0A12> CHANNEL 3   (Set receiver which IP Address is 169.254.10.18 to Channel 3
(HEX code: 3E 43 4D 44 5F 49 30 41 31 32 3E 20 43 48 41 4E 4E 45 4C 20 33 0D 0A)

<ACK_I0A12< OK   (Receiver which IP Address is 169.254.10.18 response "OK")
(HEX code: 3C 41 43 4B 5F 49 30 41 31 32 3C 20 4F 4B 0D 0A)

\>CMD_G34> CHANNEL 5   (Set receivers which Group No is 34 to Channel 5)
(HEX code: 3E 43 4D 44 5F 47 33 34 3E 20 43 48 41 4E 4E 45 4C 20 35 0D 0A) (No response from multiple receivers)

\>CMD_ALL> !OSD_ON Hello! \x28123\x29 \x22ABC\x22   (Show 「Hello! (123) "ABC"」 to all monitor and send response)
(HEX code: 3E 43 4D 44 5F 41 4C 4C 3E 20 21 4F 53 44 5F 4F 4E 20 48 65 6C 6C 6F 21 20 5C 78 32 38 31 32 33 5C 78 32 39 20 5C 78 32 32 41 42 43 5C 78 32 32 0D 0A) (No response from multiple receivers)

\>CMD_ALL> OSD_OFF 10000   (All receiver turn off OSD after 10 seconds)
(HEX code: 3E 43 4D 44 5F 41 4C 4C 3E 20 4F 53 44 5F 4F 46 46 20 31 30 30 30 30 0D 0A)

Caution:

1. Transmitter/receiver boot time require 30 seconds and will be able to control after booting, First time reboot after reset to default will be longer than 30 seconds.
2. Not recommend to work with existing LAN connection to avoid large video, data transmission or multicast packets to slow down your other LAN devices.
3. Gigabit switching hub muse support IGMP and Jumbo Frame over 8K in order to achieve the best quality
4. If monitor shows green screen, please check if the switch running under gigabit and IGMP/Jumbo Frame function enabled.
5. If video not smooth please check if IGMP function enabled or bandwidth of switch closes to maximum.
6. If UTP and SFP connected together the first connected one will get the priority, the other one will online automatically once another one failed.
7. If Ethernet is not connected may cause unpredictable problem or OSD message error, please connect to the Ethernet and reboot.
8. Default EDID is 1080p 7.1 audio, you can use Menu function 96 to copy EDID from monitor of RX.
9. If the monitor of RX shows shortly then turns into black but OSD shows properly, please check the HDCP version of monitor support is tally with the source required, and the casting mode of TX/RX are the same and the HDCP setting is correct.
10. If receiver switches to transmitter which no video input, it will show blank screen or last still image for seconds.
11. Fast switch mode might cause screen or audio abnormal briefly when switch channel.
12. When output resolution is fixed, the screen or OSD might be cut a little if the source resolution is much different with the output (like 4K downscale to 720p).
13. In high resolution (like 1080p or 4K) the OSD response will be delayed a little bit.
14. In video wall mode, the OSD may not be in correct size and position
15. When value over 999, the Seven-segment display of HKM02B-4K will show U or F.
16. RS-232 only support data transmission (TXD, RXD), not support hardware handshake (RTS, CTS, DTR, DSR…)
17. Power from power adapter with priority than power from PoE.
18. The front panel IR will be disable when external IR cable plugged.
19. If IR remote not work properly, please check the battery (especial in low temperature) and reset IR ID.
20. Audio in of RX only works at unicast mode, and the audio in and audio out of TX must be connected.
21. Audio in of RX is designed for mono Mic in, not for stereo Line in.
22. When using computer or mobile APP management the IP address should be set in same network segment.
23. Computer software and APP operation please refer to software operating instruction.
24. Not recommend control by panel, computer software and APP at the same time to prevent conflict.

APP name: Stream & Videowall Management

Google Play Download Link
https://play.google.com/store/apps/details?id=com.sct.sctcontrollcenter1

iTunes Download Link

Google Play Download QR code   **iTunes Download QR code**

For APP instruction please refer attached software CD

To avoid confusion we do not recommend install multiple APP in one device

Web Setting Function:

System provide detail settings over web browser, you could input the IP address of transmitter / receiver at link column of browser if you know the exact IP address of them.

How to get the IP address of receiver:

1. Connect monitor with receiver, **local IP** shows on right bottom screen when receiver booting or transmitter not connected(or no video input)
2. Press remote control button *MENU, 1, ENTER* (Network Information), it will shows the receiver IP Address on screen

How to get the IP address of transmitter:

1. Connect monitor with receiver, connect receiver with transmitter and set in the same channel, **remote IP** shows on right bottom screen when receiver booting or no video input from transmitter

Set IP address of transmitter/receiver by command:

Press and hold panel button "+" then power on to set factory default then enter engineering mode. In engineering mode Power and Link LED will be flash together, IP address of unit will be set to Static IP 192.168.0.88 temporarily, login to the web page by browser and change IP settings in API commands column as below(**x** can be one of numbers **1~254**):

astparam s ip_mode static

astparam s ipaddr **169.254.x.x**

astparam s netmask **255.255.0.0**

astparam save

Commands can be applied one by one, or connected them by ";" to apply at once as below:

astparam s ip_mode static;astparam s ipaddr **169.254.x.x;**astparam s netmask **255.255.0.0;**astparam save

Also you could use private IP address/subnet mask you preferred like **192.168.x.x/255.255.255.0**

Bonjour plug-in installation:

a. Click "BonjourSDKSetup.exe" to install Bonjour plug-in for Internet Explorer.
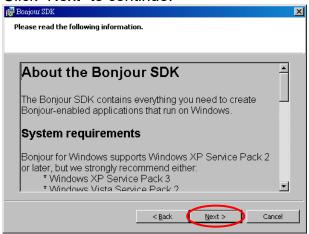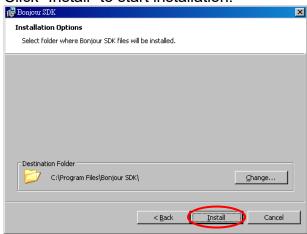

b. Click "Next" to continue.

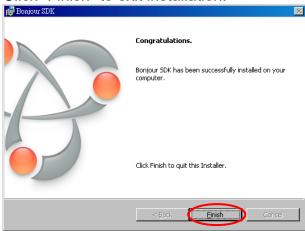c. Click "I accept the terms in the license agreement" to continue.

d. Click "Next" to continue.
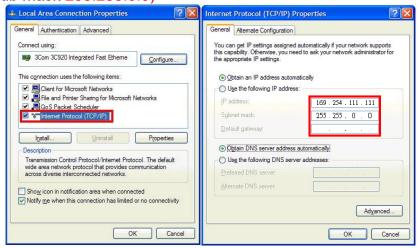
e. Click "Install" to start installation.

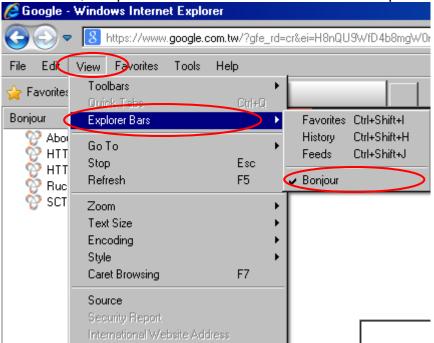
f. Click "Finish" to exit installation.

g. Right click on "My Network Place" → "Properties" then right click on "Local Area Connection" → "Properties" then double click on "Internet Protocol (TCP/IP)" to setting as below:
   (IP address 169.254.111.111, sub mask 255.255.0.0)

Use CAT5 cable to connect transmitter/receiver RJ45 port to PC LAN port, direct input known IP address of TX/RX, or open IE browser then select View → Explorer Bars → Bonjour.
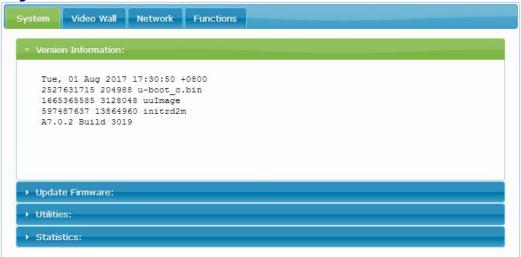

Double click on "HTTP on ast3-tx-xxxx(x= channel of transmitter)" or "HTTP on ast3-rx-xxxxxxxxxxxx (x= MAC address of receiver)", it will pop up web setup in Bonjour windows as below:

Click Network page you will see the IP address of transmitter/receiver

System:

Version Information:

```
Tue, 01 Aug 2017 17:30:50 +0800
2527631715 204988 u-boot_c.bin
1665365585 3128048 uuImage
597487637 13864960 initrd2m
A7.0.2 Build 3019
```

- Version Information   Firmware version information
- Update Firmware   Update system firmware
- Utilities   System tools
  - Factory Default   Set system to factory default
  - Reboot   Reboot system
  - Default EDID   Set EDID to default
  - Console API Command   Run Console API command
- Statistics   System status

Video Wall:

Basic Setup
- Bezel and Gap Compensation: Set outer width/height of monitor and width/height of viewable area.
- Wall Size and Position Layout: Set scale of video wall and position of monitor
- Preferences: Set extension way and rotation

Advance Setup:
- Step 1: Select target to control
- Step 2: Select option to apply

Network:

IP Setup:
● IP Mode could be Auto IP, DHCP, Static three mode
  Host default setting is Static IP, client default setting is Auto IP
  For mass deploying please use static or DHCP mode.
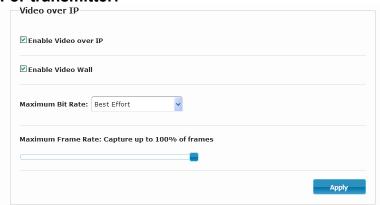 **Notice: if there is no DHCP server in network the host/client will keep reboot, you need to set the host/client to factory default**
  Press channel button "**-**" than power on (power and link LED will be flash)

● Casting Mode : could be Multicast, Unicast   mode, default is Multicast，
  When using Multicast mode, please check the "Auto select USB operation mode per casting mode" box
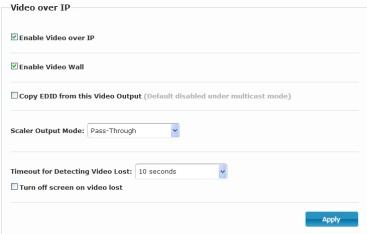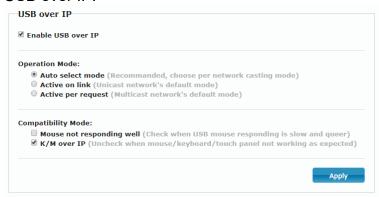
Functions:

For transmitter:

- Enable Video over IP: This function setup the video signals send from network, default is checked.
- Enable Video Wall: This function setup the video wall, default is not checked.
- Maximum Bit Rate: Set maximum bit rate.
- Maximum Frame Rate: Set maximum frame rate.
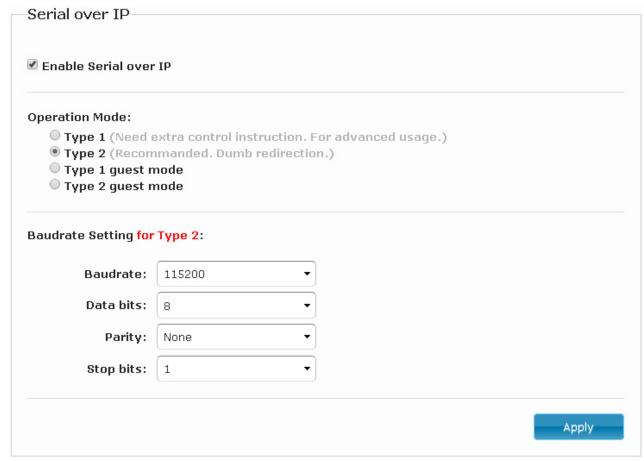
For Receiver:

- Enable Video over IP: This function setup the video signals send from network, default is checked.
- Copy EDID from this Video Output: Check this box will auto copy EDID from the TV connected to receiver when receiver booting **(unicast mode only)**, default is not checked.
- Scaler Output Mode: Set video output resolution.
- Timeout for Detecting Video Lose: **Set timeout for detecting video lose, please do not change.**
- Turn off screen on video lost: **Please do not check this box**

USB over IP:

- Enable USB over IP: Enable/disable USB extender function.
- Operation Mode: Set USB operation mode. **Recommand Auto select mode.**
- Compatibility Mode: Set USB compatibility mode.

Serial over IP：

This function setup Serial (RS232) signal sends from network
- Operation Mode:
  Default is "Type 2 (Recommended. Dumb redirection.)"
- Baudrate Setting for Type 2 : **default is 115200, 8, None, 1**

Package:

HKM02BT-4K Package Include:
Transmitter x 1
USB A to B cable x 1
IR emitter cable x 1
IR receiver cable x 1
DC 12V 1.5Amp power adapter x 1

HKM02BR-4K Package Include:
Receiver   x 1
IR emitter cable x 1
IR receiver cable x 1
IR remote control x1
DC 12V 1.5Amp power adapter x 1

HKM02BPT-4K Package Include:
Transmitter x 1
USB A to B cable x 1
IR emitter cable x 1
IR receiver cable x 1

HKM02BPR-4K Package Include:
Receiver   x 1
IR emitter cable x 1
IR receiver cable x 1
IR remote control x1

HKM02BT Package Include:
Transmitter x 1
USB A to B cable x 1
IR emitter cable x 1
DC 5V 2Amp power adapter x 1

HKM02BR Package Include:
Receiver   x 1
IR emitter cable x 1
IR remote control x1
DC 5V 2Amp power adapter x 1

Specification:

ITEM	HKM02BT-4K	HKM02BPT-4K	HKM02BR-4K	HKM02BPR-4K
Copper Distance	150M (Use Network Switch Max 100M)			
HDMI Video Support	Up to 4K UHD 4:4:4 @ 30Hz			
HDCP Compliant	HDCP 2.2			
HDMI Audio Support	Up to 7.1 LPCM 192Khz / Dolby True HD / DTS-HD Master Audio / ATMOS / DTS:X			
HDMI Input	HDMI Type-A			
HDMI Loop Output	HDMI Type-A			
HDMI Output			HDMI Type-A	
Analog Audio Input	Line In, 3.5mm Stereo Phone Jack		Mic In, 3.5mm Mono Phone Jack	
Analog Audio Output	Line Out, 3.5mm Stereo Phone Jack			
USB	USB 2.0 Type B x 1 (Rear)		USB 1.1 Type A x 2 (Front) USB 2.0 Type A x 2 (Rear)	
IR Receiver (Int & Ext)	3.5mm Stereo Phone Jack 20-60Khz / ±45° / 5M			
IR Emitter (Ext)	3.5mm Stereo Phone Jack 20-60Khz / ±45° / 5M			
RS-232	DB9 Female		DB9 Male	
	(Not support hardware handshake)			
Ethernet	Gigabit RJ45			
Fiber	SFP			
Power Consumption	600mA (Typical)		500mA (Typical, No USB Device)	
Power Supply	DC 12V 1500mA		DC 12V 1500mA	
PoE Support		802.3af		802.3af
Dimensions mm	210 x 123 x 40		167 x 103 x 40	
Weight g	680		500	

ITEM	HKM02BT	HKM02BR
Copper Distance	150M (Use Network Switch Max 100M)	
HDMI Video Support	Up to 1080p, 1920x1200@60Hz	
HDCP Compliant	HDCP 1.4	
HDMI Audio Support	Up to 7.1 LPCM 192Khz / Dolby True HD / DTS-HD Master Audio / ATMOS / DTS:X	
HDMI Input	HDMI Type-A	
HDMI Loop Output	HDMI Type-A	
HDMI Output		HDMI Type-A
Analog Audio Input	Line In, 3.5mm Stereo Phone Jack	Mic In, 3.5mm Mono Phone Jack
Analog Audio Output	Line Out, 3.5mm Stereo Phone Jack	
USB	USB 2.0 Type B x 1 (Rear)	USB 1.1 Type A x 2 (Right) USB 2.0 Type A x 2 (Left)
IR Receiver (Internal)	20-60Khz / ±45° / 5M	
IR Emitter (External)	3.5mm Stereo Phone Jack 20-60Khz / ±45° / 5M	
RS-232	DB9 Female	DB9 Male
	(Not support hardware handshake)	
Ethernet	Gigabit RJ45	
Power Consumption	1350mA (Typical)	900mA (Typical, No USB Device)
Power Supply	DC 5V 2000mA	
Dimensions mm	125x140x30	125x140x30
Weight g	380	390

RoHS CE FC C