

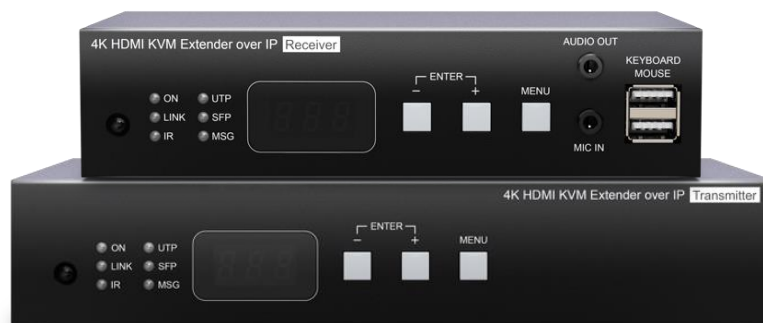


AV over IP Extender

User Manual

Model : HKM02B-4K

4K HDMI KVM & USB, RS232 , IR, Audio over IP Extender



Introduction

HKM02B-4K uses AV over IP technology to route up to 1,000 4K HDMI sources to up to 60,000 displays over IGMP and Jumbo frame protocol gigabit switches, which can achieve HDMI signal extending, distributing, switching and routing.

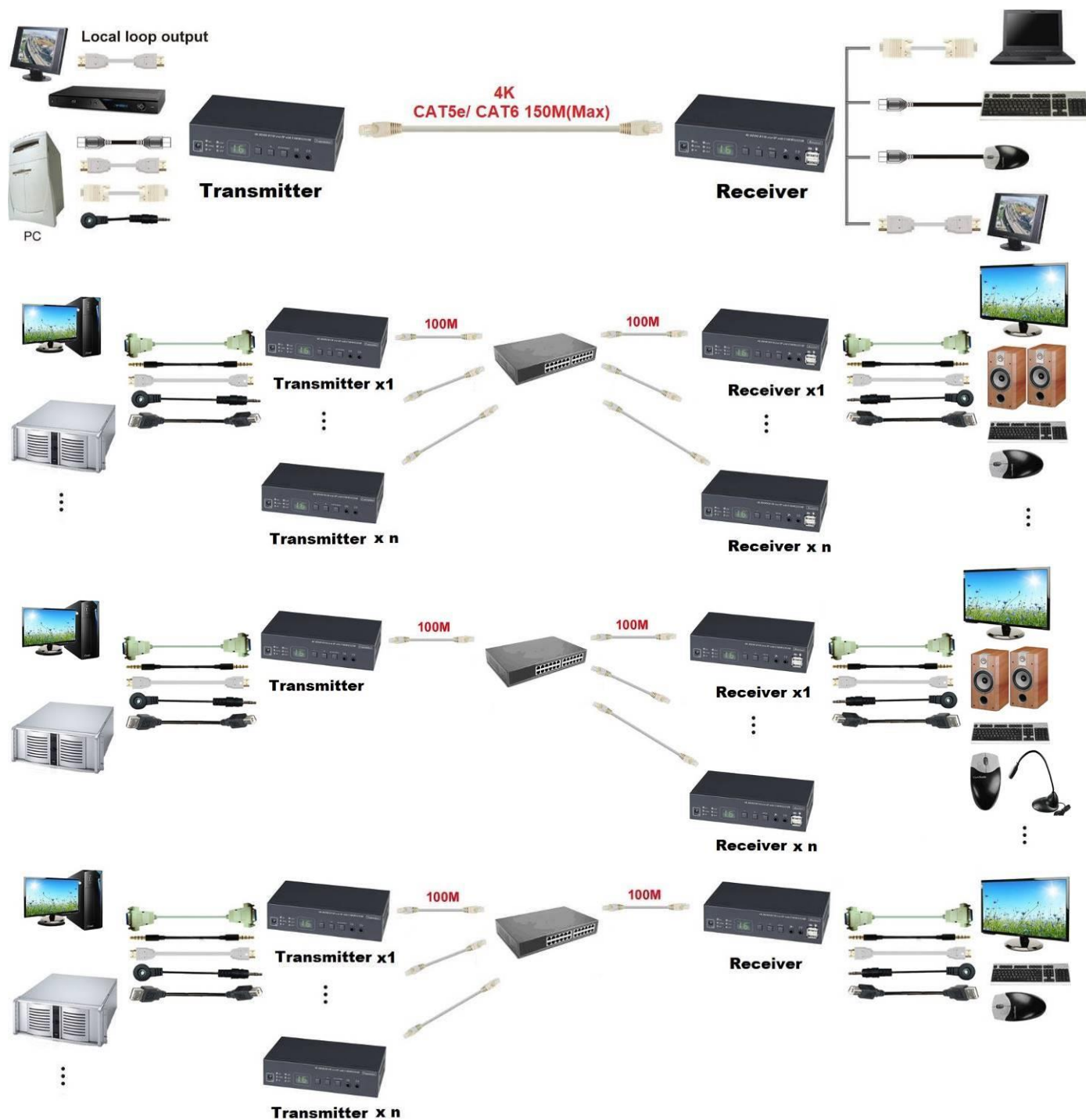
Additionally, the boundless switching function allows you to use one mouse to operate multiple PCs by moving the mouse cursor across the monitors' borders.

HKM02B-4K is a multifunctional system that integrates multiple media. You can perfectly apply it to large-scale security rooms, classrooms, trading rooms, and many more.

Features

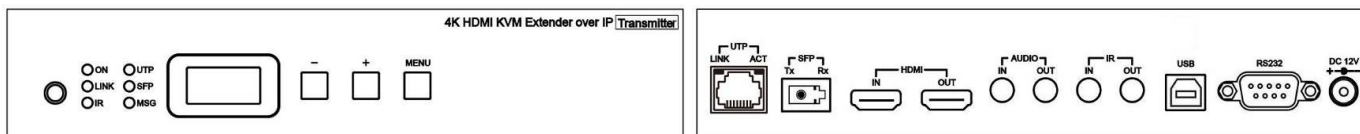
- Resolution up to 4K@30Hz 4:4:4
- Signal extension up to 150M over CAT5e (or greater), 60KM over fiber optic cable.
- workable with Ethernet switches for HDMI extension, distribution, switching, and matrix.
- Built-in loop out, an extra local HDMI display at TX side.
- Built-in 4 USB ports for keyboard, mouse, flash drive...etc.
- Supports up to 8 x 16 video wall.
- Supports video scaler, 4K to 1080p/ 1080p to 4K.
- Supports HDMI audio embedding and extraction function.
- Supports USB, full-duplex RS232, bi-directional IR, analog audio transmission.
- Supports RS232 signal distribution.
- workable with SR01X (IP repeater) for longer distance.
- Managed via Windows based software, Android/iOS APP, Web GUI, IR remote, panel pushbutton, Telnet API, RS232 console.

Installation view

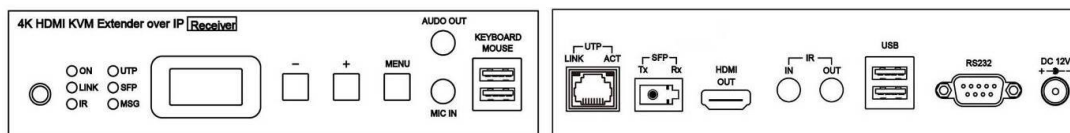


Panel view

HKM02BT-4K



HKM02BR-4K



Panel Button Function

| Button | - | + | Menu |
|------------------------------|-----------------|------------------|---|
| Short Press | Reduce Number | Increase Number | Menu/Cancel |
| | Enter | | |
| Press 1 seconds | Carry | Decomposition | Lock/Unlock Button(When no OSD menu) |
| Press 3 seconds | | | |
| Press and hold then power on | Factory Default | Engineering Mode | Set Factory Default then enter Engineering Mode |

Reduce Number: switches channel or function number down

Increase Number: switches channel or function number up

Carry: shifts the three numbers in display one position to the left

Decomposition: shifts the three numbers in display one position to the right

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 update firmware.

Front Panel LED Indication

| Panel LED | Status | HKM02B-4K |
|---------------|-------------------|--|
| Power (Green) | On | Boot completed |
| | Flash Twice | Booting |
| | Flash Slowly | Transmitter: stop link Receiver: video output be turned off |
| | Breathing(Fading) | Screen saver mode (not available for transmitter) |
| Link(Blue) | On | Connected & video is streaming |
| | Flash | Connecting, or no source input from transmitter |
| IR(Red) | On | Transmitting /receiving IR signal |
| UTP (Green) | On | Connected by UTP RJ45 port |
| | Flash | Transmitting /receiving data from UTP RJ45 port |
| SFP(Blue) | On | Connected by Fiber SFP port |
| | Flash | Transmitting /receiving data from Fiber SFP port |
| MSG(Red) | On | Other message (IR, RS232, System setting...) |
| | Flash 2~9 Times | System warning, Alert (Refer to MSG/IR Status Indication) |

MSG/IR LED Status Indication

| Times | HKM02B-4K MSG LED |
|-----------|---|
| Always ON | IR control, RS232 control, system setting |
| 2 | IR control disabled |
| 3 | Transmitters channel conflict |
| 4 | DHCP server not found |
| 5 | Rest to factory default |
| 6 | Engineering mode / Firmware update mode |
| 7 | Manufacture setting mode |
| 8 | Aux system stopped |
| 9 | Aux system firmware boot sector error |
| 10 | Aux system firmware type error |

RJ45 LED Indication

| RJ45 LED | Status | Description |
|--------------|--------|--------------------|
| LINK (Green) | On | Ethernet connected |
| ACT (Orange) | Flash | Data transmission |

RJ45 Pin Define

Video Link (TIA/EIA-568-B)

| | |
|-----------------|---------|
| 1. Orange-white | DATA0 + |
| 2. Orange | DATA0 - |
| 3. Green-white | DATA1 + |
| 4. Blue | DATA2 + |
| 5. Blue-white | DATA2 - |
| 6. Green | DATA1 - |
| 7. Brown-white | DATA3 + |
| 8. Brown | DATA3 - |

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: SR01X 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 Casting Mode/IP Settings

Casting Mode

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 one 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.

IP Mode

System default IP setting is **Static IP**, IP mapping to last 4 digits of MAC address (Hex), for example MAC XX:XX:XX:XX:12:AB, the IP address will be 169.254.18.171

You could also set to **DHCP** or **Auto IP**, please refer to web setting chapter: **IP Setting: Page 18**.

In **Auto IP** mode it will assign **169.254.X.X** (subnet mask **255.255.0.0**) to transmitters and receivers without DHCP server.

We recommend Static IP mode when using APP or PC software control to prevent any IP change 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.



IR Remote Control Setting























You could use the IR infrared remote control to preset channel selection and other menu function. 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.

 +  . (without transmitter or receiver)

IR Remote Control Button

| Symbol | Button | Receiver Function | Transmitter Function |
|---|----------|--|--|
|  | POWER | Turn Off/On Video Output | Connect/Disconnect Receiver |
| Setup Remote Control ID | | | |
|  | MENU | Menu selection, input numbers after press menu button | |
|  | UP | Increase Value | |
|  | DOWN | Reduce Value | |
|  | LEFT | Carry | |
|  | RIGHT | Decomposition | |
|  | ENTER | Enter / Show Channel Information (When no other Menu operation) | Enter |
|  | ASTERISK | Cancel | |
|  | NUMBER | Recall Previous Value | |
|  | A | Favorite Channel Switching | Set RS232 to Auxiliary Mode to Receive Menu Message |
|  | B | Back to Previous Channel | Set RS232 to Extender Mode |
|  | 1 | Number 1 | |
|  | 2 | Number 2 | |
|  | 3 | Number 3 | |
|  | 4 | Number 4 | |
|  | 5 | Number 5 | |
|  | 6 | Number 6 | |
|  | 7 | Number 7 | |
|  | 8 | Number 8 | |
|  | 9 | Number 9 | |
| | 0 | Number 0 | |

IR 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:

In screen saver mode (30 seconds without video input), press any button of IR remote/pane to wake up

Connect /Disconnect Connection for Transmitter:

Press **POWER** of IR remote to connect/discount connection.

Turn On/Off Video Output for Receiver:

Press **POWER** of IR remote to turn on/off monitor, press panel button **CH-** and **CH+** together to turn on

IR Quick Block for Receiver:

#: 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 for Receiver:

MENU+POWER: Switch between TV Wall/Single monitor modes immediately.

Add Favorite List for Receiver:

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

Remove Favorite List for Receiver:

MENU+B: Remove current channel from favorite list in menu

Set RS232 Mode for Transmitter:

MENU+A: Switch to message mode to receive response instead of OSD.

MENU+B: Switch to extender mode.

IR 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 | RS232 Control Information | RS232 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 | 1 |
| 17 | Free Routing | Free Routing setting | 1 = Enable | 1 | 1 |
| 20 | Video Function | Video Extender setting | 0 = Disable 1 = Enable | 1 | 1 |
| 21 | Audio Function | Audio Extender setting | | 1 | 1 |
| 22 | USB Function | USB Extender setting | | 1 | 1 |
| 23 | RS232 Function | RS232 Extender setting | | 1 | 1 |
| 24 | IR Function | IR Extender setting | | 1 | 1 |
| 25 | Video Wall Function | Video Wall setting | | 1 | 1 |
| 27 | Keyboard Mouse Function | Keyboard Mouse Extender setting | | 1 | 1 |
| 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 | 0 | X |
| 37 | Rotary Switch | HKM02BT Channel Switch | 1 = Enable | X | 1 |
| 41 | Scaler Output Mode | Video output resolution setting | 0 = Pass-Through 1 = Pass-Through (Strict) 2 = Auto Detect (Per EDID) 3 = Full HD 1080p 60Hz 4 = Full HD 1080p 50Hz 5 = Customize | 0 | X |
| 42 | Audio Select | TX Audio Input Select /RX Audio Output Select | 0 = Digital 1 = Analog | 2 | 2 |

| | | | | | |
|----|----------------------|--------------------------------------|---|----|----|
| | | | 2 = Auto | | |
| 43 | Analog Input Volume | Analog Input Volume | 0 = Mute | 85 | 85 |
| 44 | Analog Output Volume | Analog Output Volume | 1 ~ 100 = Volume % | 85 | 85 |
| 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 | EDID Update | Update EDID from TX or monitor of RX | | V | V |
| 48 | EDID Select | Select default EDID of TX | 0 = Default HDMI 1 = Default DVI 2 = Default VGA 3 = Loopout Monitor (HKM02B Only) | X | 1 |
| 49 | HDCP Always On | HDCP setting | 0 = Disable 1 = HDCP 1.4 Always On 2 = HDCP 2.2 Always On | 0 | 0 |
| 50 | RS232 Select | RS232 Port Mode Select | 0 = Disable 1 = Extender 2 = Keypad 3 = Auxiliary 4 = Console | 1 | 1 |
| 51 | RS232 Baudrate | RS232 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) | 1 | 1 |
| 53 | RS232 Trigger | RS232 Control Trigger setting | 2 = Mac (0x0D) 3 = Other (0x0A, 0x0D) | 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) | 1 | 1 |
| 56 | Auxiliary Trigger | Auxiliary Trigger setting | 2 = Mac (0x0D) 3 = Other (0x0A, 0x0D) | 1 | 1 |
| 57 | Device No | Device No. for RS232 control | 0 ~ 999 | 0 | X |
| 58 | Group No | Group No. for RS232 control | | 0 | X |
| 59 | Party No | Party No. for RS232 control | 0 ~ 99 | 0 | X |
| 60 | Fast Switch | Switch without stop link | 0 = Disable | 1 | 1 |
| 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 | 0 | X |
| 64 | Lock Favorites | Lock Favorites Channel | 1 = Enable | 0 | X |

| | | | | | |
|-----|---------------------------|-----------------------------------|--|------|---|
| 65 | Auto Sort Favorites | Auto Sort Favorites Channel | | 0 | X |
| 66 | Sort Favorites | Sort Favorites Channel | Immediately sort favorite channel | V | X |
| 67 | Scan Channel To Favorites | Scan Channel To Favorites | | V | X |
| 70 | Direct Access Menu | Run menu function even hide | | 1 | 1 |
| 71 | Menu Item "Advanced Menu" | Display/Hide "Advanced Menu" | 0 = Disable 1 = Enable | 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 | | 1 | X |
| 75 | Message Redirect | Message Redirect to Auxiliary | 0 = Disable 1 = Enable | X | 1 |
| 76 | Command Redirect | Command Redirect to Auxiliary | | 1 | 1 |
| 80 | Video Routing | Video Routing setting | | 1000 | X |
| 81 | Audio Routing | Audio Routing setting | | 1000 | X |
| 82 | USB Routing | USB Routing setting | 0 ~ 999 = Specific Channel | 1000 | X |
| 83 | RS232 Routing | RS232 Routing setting | 1000=Follow Channel | 1000 | X |
| 84 | IR Routing | IR Routing setting | | 1000 | X |
| 86 | GPIO Routing | GPIO Routing setting | | 1000 | X |
| 87 | Load Routing Mapping | Load Free Routing Mapping | | V | X |
| 88 | Save Routing Mapping | Save Free Routing Mapping | 0~3 | V | X |
| 90 | Video Wall Max Row | Rows of Video Wall(Vertical) | 0~7 (0=row 1, 1=row 2...) | 0 | X |
| 91 | Video Wall Max Column | Columns of Video Wall(Horizontal) | 0~15 (0=column 1, 1=column 2) | 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 | X |
| 95 | Monitor Outside Height | Outer Height of Monitor | | 0 | X |
| 96 | Monitor Viewable Width | Width of Viewable Area | 0~65000 (0.1mm) | 0 | X |
| 97 | Monitor Viewable Height | Height of Viewable Area | | 0 | X |
| 100 | Stretch Type | Screen Stretch Type | 0 = Auto 1 = Stretch Out 2 = Fit In | 2 | X |
| 101 | Rotate | Screen Rotation and Mirror | 0 ~ 7 | 0 | X |
| 102 | Vertical Shift | Screen Vertical Shift | 400 = Default 399 ~ 0 = shift up 401 ~ 801 = shift down | 400 | X |
| 103 | Horizontal Shift | Screen Horizontal Shift | 400 = Default 399 ~ 0 = shift left 401 ~ 801 = shift right | 400 | X |
| 104 | Vertical Scale | Screen Vertical Scale | | 0 | X |
| 105 | Horizontal Scale | Screen Horizontal Scale | 0 ~ 255 | 0 | X |
| 106 | Load Video Wall | Load Video Wall Setting | | V | X |
| 107 | Save Video Wall | Save Video Wall Setting | 0~15 | V | X |
| 200 | Backup Setting | Backup Setting to bank 0~3 | | V | V |
| 201 | Restore Setting | Restore Setting from bank 0~3 | 0 ~ 3 | V | V |
| 202 | System Setting | System Setting | | V | V |
| 203 | Application Setting | Application Setting | 0~255 (Debug use, no recommend for general users) | V | V |
| 333 | Reset To Default | Reset to factory default | | V | V |
| 400 | Preset Configuration | Set RX Group ID | 0 ~ 15 (OEM Version only) | V | X |
| 999 | System Reboot | System Reboot | | V | V |

V = Available X = Not available Numbers = default value

Caution of IR Menu Function

- **Menu 17** Free Routing function only works in Multicast mode.
- **Menu 22** When disable USB extender function it will also disable keyboard mouse function.
- **Menu 25** Display or hide TV wall setting in the webpage.
- **Menu 27** You could disable keyboard mouse extender if any compatible issue, it will use USB extender instead of keyboard mouse extender.
- **Menu 33** To set customize IR remote, need to be import to RX by RS232 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 41** Pass-Through means output resolution follow TX EDID, Auto Detect(Per EDID) means output resolution follow monitor EDID of RX, Customize resolution need to be setup by RS232 command or web page
- **Menu 47** Use default EDID at TX side, or copy monitor EDID at RX side. (In multicast mode)
- **Menu 49** Monitor HDCP version setting, with incorrect HDCP version setting it will show HDCP fail on black screen.

| Option | Description |
|--------------------|---|
| Disable | HDCP version follow source and Stream Type of content |
| HDCP 1.4 Always On | Monitor support HDCP 1.4 |
| HDCP 2.2 Always On | Monitor support HDCP 2.2 |

- **Menu 50** Extender = RS232 extender, Keypad = for RS232 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, it 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 TX channel number at booting, reconnection and before switching, if channel number already existed the connection will be interrupted.
- **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 of OSD.
- **Menu 76** Command Redirect run RS232 command from Web or telnet port (Auxiliary mode).
- **Menu 80~86** Fix selected function not follow the channel, only available when free routing enabled.
- **Menu 90~107** Only available when video wall function enabled.

- **Menu 200** Will not backup the parameters of men function 107 Save Video Wall.
- **Menu 333** Will clear the parameters of men function 107 Save Video Wall.

RS232 Control

In RS232 extender mode, user could use RS232 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.: 2218688612AB = M8612AB |
| 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 | |
| TX | Transmitter which connected to RS232 port currently. | |
| RX | Receiver which connected to RS232 port currently.(for Auxiliary mode) | |

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.

Example:

>CMD_M8612AB> CHANNEL 12

(Set receiver which last 6 digits MAC Address is 8612AB to Channel 12)

<ACK_M8612AB< OK

(Receiver which last 6 digits MAC Address is 8612AB response "OK")

RS232 Command and Parameters List

| Command | Parameters | Description | Remark |
|---------|---------------------------|------------------------------------|--|
| CHANNEL | ? | Show current channel number | |
| | [0~999] | Switch to specified channel | Transmitter not support parameter NAME |
| | [0~999] NAME ? | Check current channel name | |
| | [0~999] NAME "string" | Set channel name, 28 character MAX | |
| | NAME ? | Show channel name setting | Receiver not support parameter CHECK |
| | 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, SCALER, CUSTOMIZE, RESUME, PAUSE, and 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 input / output mode | |
| | SELECT [0~2] | Set input / output, 0=DVI, 1=VGA, 2=DVI+VGA | |
| | SCALER ? | Status of video output resolution | |
| | SCALER [0~4 5] | Set output resolution, 5=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 | |
| | LOAD 0~15 | Load video wall setting (all) | |
| | LAYOUT 0~15 | Load video wall layout (MAX Row/MAX Column/Row/Column) | |
| | SAVE 0~15 | Save video wall setting (all) | |
| | 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 [0~2] | Set stretch, 0 = Auto, 1 = Stretch Out, 2 = Fit In | |
| | 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 or RX output (0=Digital, 1=Analog, 2=Auto) | |
| | 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) | |
| | KM FUNC ? | Status of keyboard mouse extension | |
| KM FUNC [ENABLE DISABLE] | Enable/disable keyboard mouse extension | | |
| 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 | |
| | SELECT ? | Status of RS232 setting | |
| | SELECT [0~4] | 0=Disable, 1=Extender, 2=Keypad, 3=Auxiliary, 4=Console | |
| | 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 | Transmitter not support parameter ROUTING | |
| TRIGGER [0~3] | 0=Linux, 1=Windows, 2=Mac, 3=Other | | |
| 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 | |
| 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 | |
| ROTARY_SW | ? | Status of rotary switch | HKM02BT only |
| | [ENABLE DISABLE] | Enable/disable rotary switch | |
| HDCP | ? | Status of HDCP Always On | |
| | 0~2 | 0=Disable, 1=HDCP 1.4, 2=HDCP 2.2 | |
| EDID | UPDATE | Update EDID from monitor of RX | Transmitter not support parameter UPDATE, only HKM02BT support loop out Receiver not support parameter SELECT and Mode |
| | SELECT ? | Status of TX default EDID setting | |
| | SELECT [0~3] | 0=HDMI, 1=DVI, 2=VGA, 3=Loop Out | |
| | MODE ? | Status of EDID process | |
| HDMI | MODE [0~1] | 0=normal, 1= Patch EDID | |
| | CTRL ? | Status of HDMI 5V control | Transmitter not support parameter CTRL |
| | CTRL [ENABLE DISABLE] | Enable/disable HDMI 5V control | |
| 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 | |
| OSD | OPTION [0~2] | Set behavior after screen off | Transmitter not support this command |
| | ON "string" | Show "string" on screen (30 seconds) | |
| | OFF | Turn off OSD immediately | |
| | OFF ? | Status of OSD duration (ms) | |
| ROUTING | OFF [0~65535] | Set duration of OSD (ms) | Transmitter not support parameter LOAD and SAVE |
| | ? | Status of free routing | |
| | [ENABLE DISABLE] | Enable/disable free routing | |
| | LOAD [0~3] | Load free routing setting | |
| DEVICE | SAVE [0~3] | Save free routing setting | Transmitter not support this command |
| | ? | Status of device number | |
| GROUP | [0~999] | Set device number | Transmitter not support this command |
| | ? | Status of group number | |
| PARTY | [0~99] | Set group number | Transmitter not support this command |
| | ? | Status of party number | |
| NET | [0~99] | Set party number | Transmitter not support parameter DISCONNECT |
| | RECONNECT | Reconnect with TX/RX | |
| | 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. |
| | [0~3] | Load system setting from bank 0~4 | |
| | PRESET 0~15 | Load preset 0~15 to set RX group ID | PRESET for OEM version RX only |
| SAVE | | Save current system setting | |
| | [0~3] | Save system setting to bank 0~4 | |
| REBOOT | | Reboot | |
| CONSOLE | string | Run console API command | |
| SYSTEM | [0~255] ? | Status of system function | For debug using, if input incorrect value will cause unpredictable problem, adjust by professional installer only. |
| | [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 green means need to reboot to take effect.

※ The maximum of OSD_ON is 30 characters per line, maximum 127 characters, 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_M**861234**> CHANNEL 12 (Set receiver which last 6 digits MAC Address is **861234** to Channel 12)
(HEX code: 3E 43 4D 44 5F 4D **38 36 31 32 33 34** 3E 20 43 48 41 4E 4E 45 4C 20 31 32 0D 0A)

<ACK_M861234< OK (Receiver which last 6 digits MAC Address is F01234 response “OK”)
(HEX code: 3C 41 43 4B 5F 4D **38 36 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_G**34**> 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 4F 53 44 20 4F 4E 20 22 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** 22 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 20 4F 46 46 20 31 30 30 30 30 0D 0A)

Keypad Control



You can use RS232 Keypad or terminal program with number key to emulate IR remote operation. Before using RS232 keypad you have to select Keypad by **Menu 50 RS232 Select**, and set keypad baudrate by **Menu 54 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 |

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 the 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.

APP Control Function

APP name: B&W Video Wall Control II



Android/iOS App



App instruction

Windows 10 Software download link:

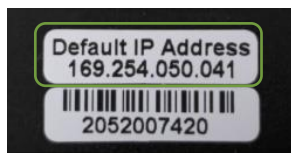
<https://www.microsoft.com/store/apps/9P268VD25977>

IP Setting

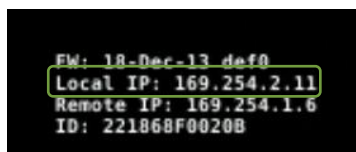
You could input the IP address of transmitter / receiver at link column of browser which printed in the label. If the label is missing or not able to identify you can check the IP address as below:

How to get the IP address of receiver:

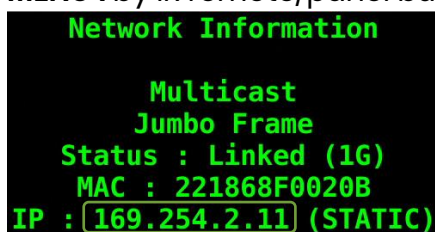
1. Check the sticker at bottom of receiver with default IP



2. Connect monitor with receiver, **Local IP** shows on right bottom.

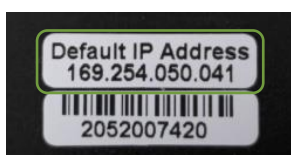


3. **MENU 1** by IR remote/panel button to shows IP Address on screen

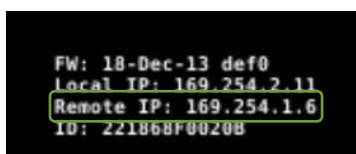


How to get the IP address of transmitter:

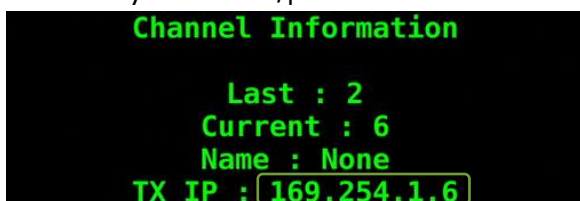
1. Check the sticker at bottom of transmitter with default IP address.



2. Connect monitor with receiver, **Remote IP** shows on right bottom.



3. **MENU 6** by IR remote/panel button to shows IP Address on screen



If the IP address on the label of transmitters/receivers is incorrect (maybe changed by someone), you could reset the transmitters and receiver to default in two ways below:

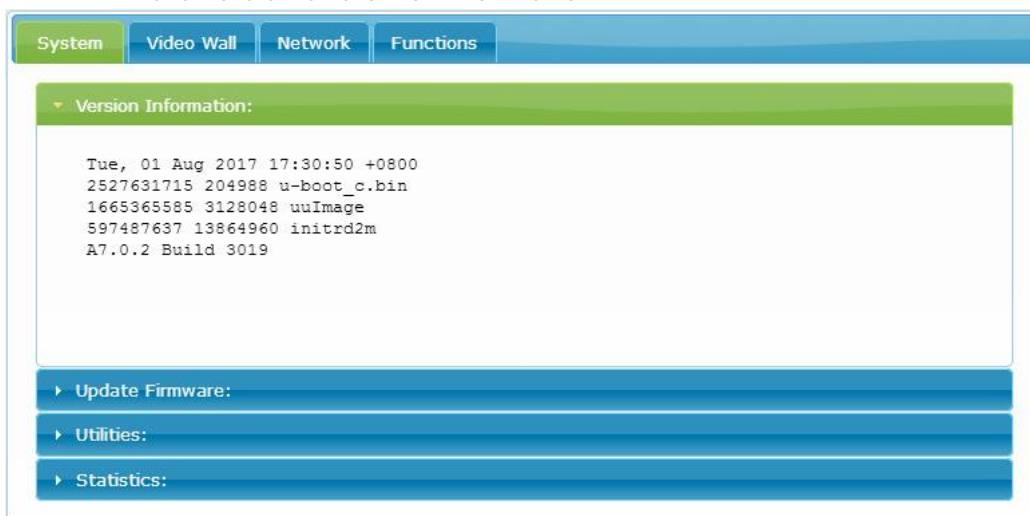
1. Press the channel button "-" than power on (power and link LED will be flash) to reset to default.
2. Press IR remote control **MENU, 3, 3, 3, ENTER** to reset to default.

Web configuration

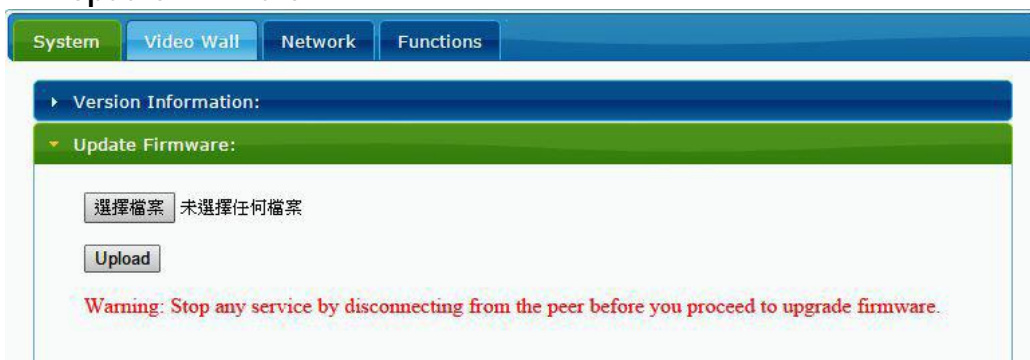
System

- **Version Information**

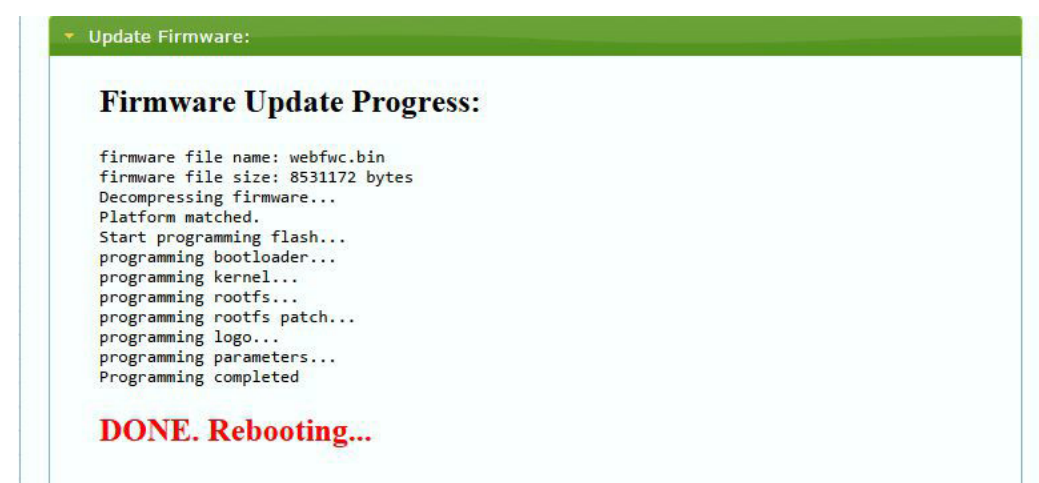
Firmware version and other information



- **Update Firmware**

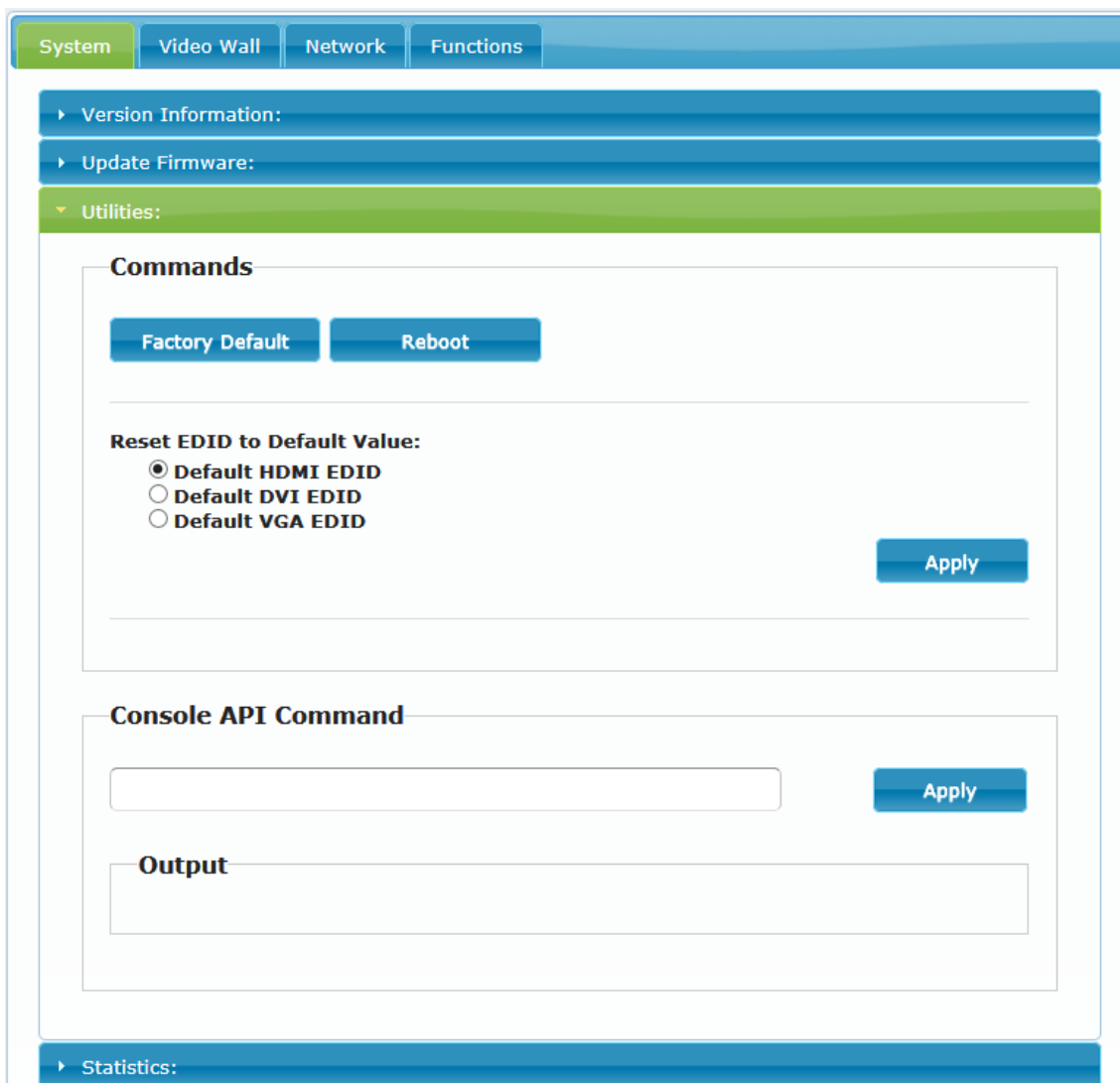


Click "Select File" to browse firmware at local disk drive then click "Upload" to start update.



During update the web will shows the status as above message. Updated unit will reboot automatically after updating firmware. If not, please reboot manually.

Do not refresh, close, switch tab of web browser or power off to avoid any damage during firmware update.



● **Utilities**

- | | |
|-----------------------|--|
| ■ Factory Default | Set system to factory default |
| ■ Reboot | Reboot system |
| ■ Default EDID | Set EDID to default 1080p 7.1 channel audio |
| ■ Console API Command | Enter Console API command to change setting or control |

● **Statistics**

Indicate system status

The screenshot displays the 'Statistics' section of a web interface. At the top, there is a navigation bar with tabs for 'System', 'Video Wall', 'Network', and 'Functions'. Below this, a list of menu items includes 'Version Information:', 'Update Firmware:', 'Utilities:', and 'Statistics:'. The 'Statistics:' item is expanded, showing three sub-sections: 'State Machine', 'Network', and 'Video'. The 'State Machine' section shows 'State: s_search'. The 'Network' section lists various network parameters: ID (Host Name): 82CA8D853D73, IP Address: 169.254.6.167, Subnet Mask: 255.255.0.0, Default Gateway: 169.254.0.254, MAC Address: 82CA8D853D73, Casting Mode: Unicast Mode, Link Status: on, and Link Mode: 1G. The 'Video' section shows 'Local Video Output: attached=n' and 'Video Timing Information: timing=[34] 640x480p@60Hz H- V- type=RGB HDCP=n (Disable) color depth=0'.

System | Video Wall | Network | Functions

- ▶ Version Information:
- ▶ Update Firmware:
- ▶ Utilities:
- ▼ Statistics:

State Machine

State: s_search

Network

ID (Host Name): 82CA8D853D73

IP Address: 169.254.6.167

Subnet Mask: 255.255.0.0

Default Gateway: 169.254.0.254

MAC Address: 82CA8D853D73

Casting Mode: Unicast Mode

Link Status: on

Link Mode: 1G

Video

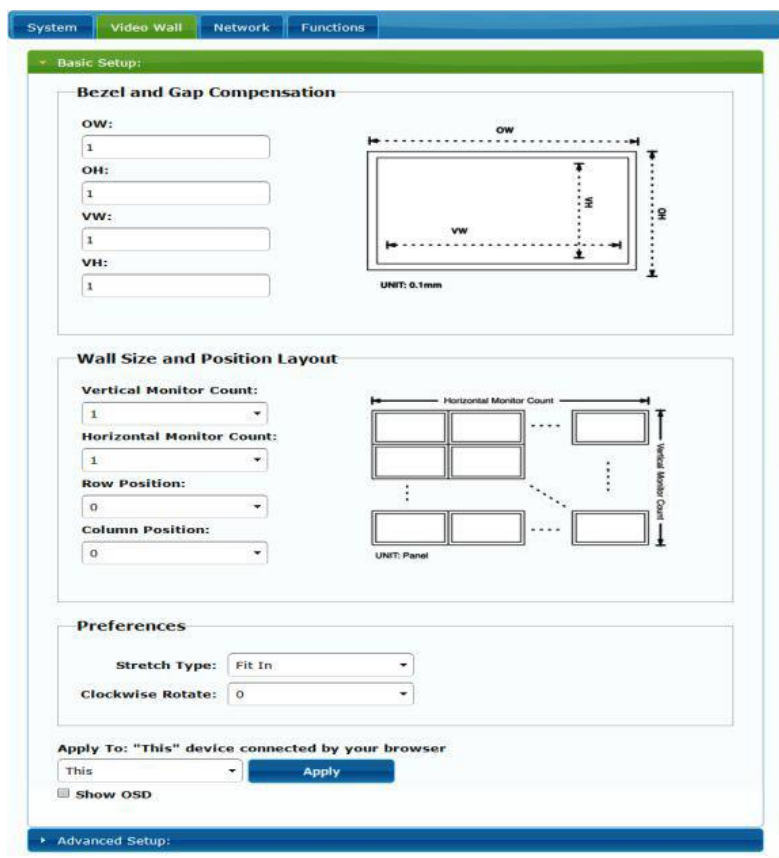
Local Video Output:

attached=n

Video Timing Information:

timing=[34] 640x480p@60Hz H- V-
type=RGB
HDCP=n (Disable)
color depth=0

Video Wall:



- **Basic Setup**
- Bezel and Gap Compensation: Set outer width/height of monitor and width/height of viewable area.
OW: outside width **OH:** outside height **VW:** viewable width **VH:** viewable height
Please note:
 1. The viewable width/height must be less than the outside width/height.
 2. Keep all values be 0 if you do not use this function.
 3. The value is based on millimeter and MUST be integer.
- Wall Size and Position Layout: Set scale of video wall and position of monitor
Vertical monitor count: 1~8
Horizontal monitor count: 1~16
Row position: 0~7
Column position: 0~15
- Preferences: Set extension way and rotation
Select the video fit in the screen or stretch out and rotate angle
- Apply To:
 1. All: Configure all Transmitter and Receiver in the list.
 2. This (Local): Current device which you log in by web browser.
 3. Hosts or Clients: select which Transmitter or Receiver you want to configure.
- Show OSD:
Check this box to show receiver's specific number (follow list order) to connected monitor

● Advance Setup:

The screenshot shows a software interface for configuring a video wall. At the top, there are tabs for 'System', 'Video Wall', 'Network', and 'Functions'. Below these, there are two main sections: 'Basic Setup' and 'Advanced Setup'. The 'Advanced Setup' section is currently active and contains two steps:

- Step 1: Choose Control Target**: This section features two sets of directional arrow buttons (up, down, left, right) and two buttons labeled 'RD' and 'This'. Below these buttons is a checkbox labeled 'Show OSD'.
- Step 2: Control Options**: This section contains several configuration options, each with an 'Apply' button:
 - Reset to Basic Setup:** A 'Reset' button.
 - Stretch Type:** A dropdown menu set to 'Fit In' and an 'Apply' button.
 - Clockwise Rotate:** A dropdown menu set to '0' and an 'Apply' button.
 - Screen Layout (Row x Column):** Two dropdown menus, both set to '1', with an 'X' between them, and an 'Apply' button.
 - Row Position:** A dropdown menu set to '0' and an 'Apply' button.
 - Column Position:** A dropdown menu set to '0' and an 'Apply' button.
 - Horizontal Shift:** Radio buttons for 'Left' and 'Right' (with 'Right' selected), a text input field set to '0', and an 'Apply' button.
 - Vertical Shift:** Radio buttons for 'Up' and 'Down' (with 'Down' selected), a text input field set to '0', and an 'Apply' button.
 - Horizontal Scale Up (N pixels/column_count):** A text input field set to '0' and an 'Apply' button.
 - Vertical Scale Up (N pixels/row_count):** A text input field set to '0' and an 'Apply' button.
 - Console API Command:** A text input field and an 'Apply' button.

Before enter “Advanced Setup”, please complete the “Basic Setup” as follows:

1. In “Basic Setup”, select Vertical and Horizontal Monitor Count.

Wall Size and Position Layout

Vertical Monitor Count:
3

Horizontal Monitor Count:
5

Row Position:
0

Column Position:
0

UNIT: Panel

2. In “Advanced Setup”, choose the target of the video wall to control

Step 1: Choose Control Target

Show OSD

Step 2: Control Options

- Reset to Basic Setup:

Reset to Basic Setup:

Reset

Press “Reset” if user make incorrect operations.

- Stretch Type:

Stretch Type:

Fit In

Fit In

Stretch Out

Apply

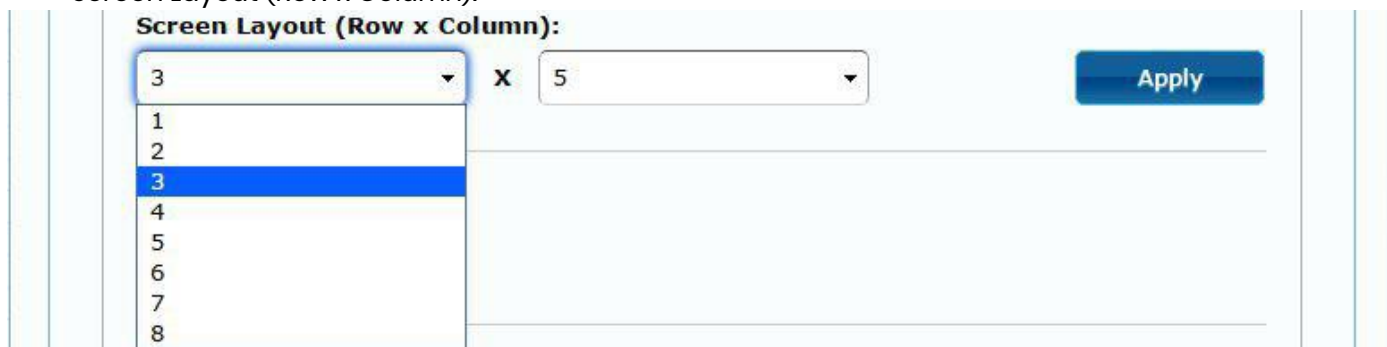
Setup the video output to “Fit In’ or “Stretch Out” mode in the screen

- Clockwise Rotate:



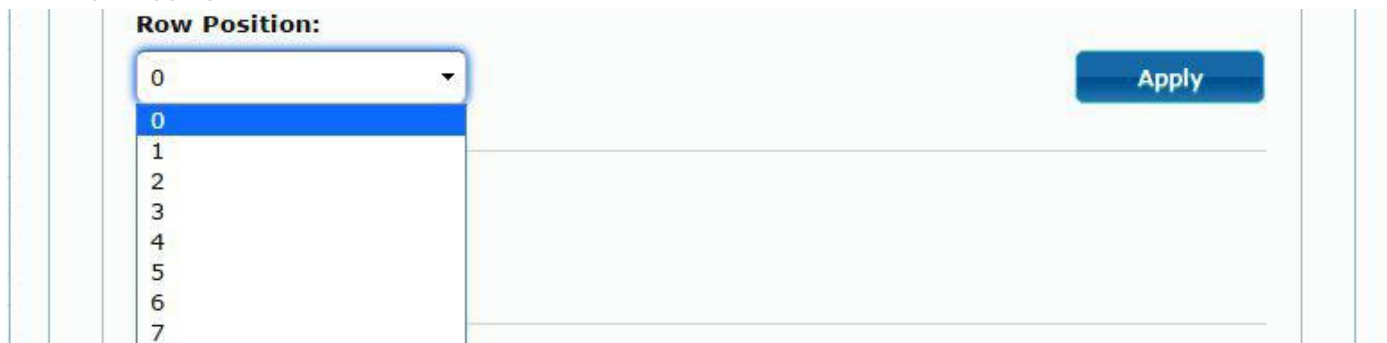
Setup the rotation angle 0,180, 270 degree of the video output

- Screen Layout (Row x Column):



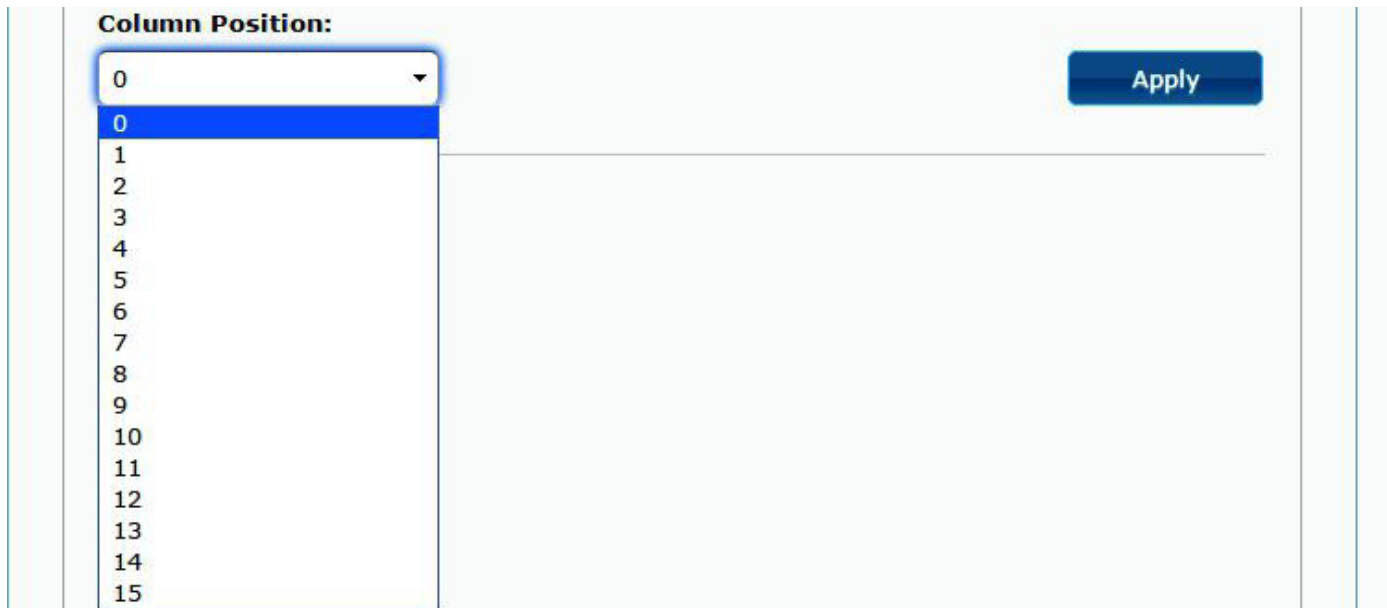
Set up the number of vertical and horizontal monitor based on the video wall layout. Vertical number 1~8 and horizontal number 1~16.

- Row Position:



Setup the row position of monitor, number from 0 to the total number of vertical monitor.

- Column Position:



Setup the column position of monitor, number from 0 to the total number of horizontal monitor.

- Horizontal/Vertical Shift:
- Horizontal/Vertical Scale Up

The screenshot shows a settings panel with four sections, each with a title, a control element, and an 'Apply' button. The first section, 'Horizontal Shift:', has 'Left' and 'Right' buttons and a text input field containing '0'. The second section, 'Vertical Shift:', has 'Up' and 'Down' buttons and a text input field containing '0'. The third section, 'Horizontal Scale Up (N pixels/column_count):', has a text input field containing '0'. The fourth section, 'Vertical Scale Up (N pixels/row_count):', has a text input field containing '0'.

Horizontal Shift: Set the video horizontal shift, Left or Right by pixels.

Vertical Shift: Set the video vertical shift, Up or Down by pixels.

Horizontal Scale Up: Set the video horizontal scale up by pixels.

Vertical Shift Scale Up: Set the video vertical shift scale up by pixels.

- Consol API Command:

The screenshot shows a single section titled 'Console API Command:' with a large text input field and an 'Apply' button.

Input Linux command to do advanced setup.

Network:

The screenshot shows a web-based configuration interface for a device. At the top, there are four tabs: 'System', 'Video Wall', 'Network', and 'Functions'. The 'Network' tab is active. Below the tabs, there are two main sections: 'IP Setup' and 'Casting Mode'.
In the 'IP Setup' section, there are three radio buttons for 'IP Mode': 'Auto IP' (selected), 'DHCP', and 'Static'. Below these are three text input fields: 'IP Address' with the value '169.254.0.238', 'Subnet Mask' with '255.255.0.0', and 'Default Gateway' with '169.254.0.254'. An 'Apply' button is located at the bottom right of this section.
In the 'Casting Mode' section, there are two radio buttons: 'Multicast' (selected) and 'Unicast'. Below these is a checkbox labeled 'Auto select USB operation mode per casting mode (recommended)', which is currently unchecked. An 'Apply' button is also present at the bottom right of this section.

- **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:

System Video Wall Network **Functions**

Video over IP

Enable Video over IP

Enable Video Wall

Maximum Bit Rate: Best Effort ▾

Maximum Frame Rate: Capture up to 100% of frames

Apply

USB over IP

Enable USB over IP

Operation Mode:

Auto select mode (Recommended, choose per network casting mode)

Active on link (Unicast network's default mode)

Active per request (Multicast network's default mode)

Compatibility Mode:

Mouse not responding well (Check when USB mouse responding is slow and queer)

K/M over IP (Uncheck when mouse/keyboard/touch panel not working as expected)

Apply

- **Video over IP**
 - ◆ Enable Video over IP: This function setup the video signals send from network.
 - ◆ 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.
- **USB over IP**
 - ◆ Enable USB over IP: Enable/disable USB extender function.
 - ◆ Operation Mode: Set USB operation mode. **Recommend Auto select mode.**
 - ◆ Compatibility Mode: Set USB compatibility mode.

● **Serial over IP :**

Serial over IP

Enable Serial over IP

Operation Mode:

- Type 1 (Need extra control instruction. For advanced usage.)
- Type 2 (Recommended. Dumb redirection.)
- Type 1 guest mode
- Type 2 guest mode

Baudrate Setting **for Type 2:**

| | |
|------------|-------------------------------------|
| Baudrate: | <input type="text" value="115200"/> |
| Data bits: | <input type="text" value="8"/> |
| Parity: | <input type="text" value="None"/> |
| Stop bits: | <input type="text" value="1"/> |

Apply

- ◆ Enable Serial over IP: 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**

Functions for Receiver:

The screenshot shows a web interface with a navigation bar at the top containing 'System', 'Video Wall', 'Network', and 'Functions' (highlighted in green). Below the navigation bar is a section titled 'Video over IP' with the following settings:

- Enable Video over IP
- Enable Video Wall
- Copy EDID from this Video Output (Default disabled under multicast mode)
- Scaler Output Mode: Pass-Through (dropdown menu)
- Timeout for Detecting Video Lost: 10 seconds (dropdown menu)
- Turn off screen on video lost

An 'Apply' button is located at the bottom right of the settings area.

- **Video over IP**
 - ◆ Enable Video over IP: This function setup the video signals send from network.
 - ◆ Copy EDID from this Video Output: Copy EDID from TV when booting (**unicast mode only**), default is not checked.
 - ◆ Scaler Output Mode: Select the required scalar output mode or select "Customize" and input 8 Hex values for more video output resolution and refresh rate selections.
 - 1) 80000004: HD 720p60
 - 2) 81000061: WXGA 1366x768@60
 - 3) 81000040: WXGA+ 1440x900@60
 - 4) 81000051: WUXGA 1920x1200@60
 - 5) 8100003C: SXGA+ 1400x1050@60
 - ◆ Timeout for Detecting Video Lose: **Please do not change this.**
 - ◆ Turn off screen on video lost: **Please do not check this box**

USB over IP

Enable USB over IP

Operation Mode:

Auto select mode (Recommended, choose per network casting mode)

Active on link (Unicast network's default mode)

Active per request (Multicast network's default mode)

Compatibility Mode:

K/M over IP (Uncheck when mouse/keyboard/touch panel not working as expected)

Apply

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

Troubleshooting

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 44 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. RS232 only support data transmission (TXD, RXD), not support hardware handshake (RTS, CTS, DTR, DSR...)
16. Power from power adapter with priority than power from PoE.
17. The front panel IR will be disable when external IR cable plugged.
18. If IR remote not work properly, please check the battery (especial in low temperature) and reset IR ID.
19. Audio in of RX only works at unicast mode, and the audio in and audio out of TX must be connected.
20. Audio in of RX is designed for mono Mic in, not for stereo Line in.
21. When using computer or mobile APP management the IP address should be set in same network segment.
22. TV wall setting parameter between APP/PC software and IR menu/Web are different and might be cover each other, we recommend set TV wall by one of two ways to prevent conflict.
23. PC 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.

Package Include

HKM02BT-4K Package Include:

Transmitter x1 pcs

USB A to B cable x1 pcs

IR emitter cable x1 pcs

DC 12V 1.5A power adapter x1 pcs

HKM02BR-4K Package Include:

Receiver x1 pcs

IR emitter cable x1 pcs

IR remote control x1 pcs

DC 12V 1.5A power adapter x1 pcs

Specification

| | | |
|----------------------------|---|--|
| ITEM NO. | HKM02BT-4K | HKM02BR-4K |
| Support | | |
| Compliance | HDCP 2.2, USB 1.1, USB 2.0 | |
| Max. Video Resolution | 4K@30Hz 4:4:4 | |
| Max. Transmission Distance | 150M over CAT5e Cable or Greater | |
| Data rate | 1Gbps | |
| Audio Format | 7.1 LPCM 192kHz, Dolby True HD, DTS-HD Master Audio, ATMOS, DTS:X | |
| IR Support | 20-60kHz , ±45°, 5M | |
| Ports & Interfaces | | |
| Video Input | 1 x HDMI Type A | 1 x RJ45 |
| Video Output | 1 x RJ45 | HDMI Type A |
| Video Loop-out | 1 x HDMI Type A | |
| Analog Audio Input | 1 x 3.5mm Stereo Phone Jack (Line In) | 1 x 3.5mm Mono Phone Jack (Mic In) |
| Analog Audio Output | 1 x 3.5mm Stereo Phone Jack (Line Out) | 1 x 3.5mm Stereo Phone Jack (Line Out) |
| USB Interface | 1 x USB Type B (USB 2.0) | 2 x USB Type A (USB 1.1) 2 x USB Type A (USB 2.0) |
| IR Interface | 1 x 3.5mm Stereo Phone Jack | 1 x 3.5mm Stereo Phone Jack |
| RS232 Interface | 1 x DB9 Female | 1 x DB9 Male |
| Link Interface | 1 x RJ45, 1 x SFP | 1 x RJ45, 1 x SFP |
| Power | | |
| Power Supply | DC 12V 1.5A | DC 12V 1.5A |
| Power Consumption | 600mA | 500mA |
| Ambient Temperature | | |
| Operation | 0 to 55°C | |
| Storage | -20 to 85°C | |
| Humidity | Up to 95% | |
| Physical Characteristics | | |
| Dimensions | 210 x 123 x 40mm | 167 x 103 x 40mm |
| Weight | 680g | 500g |