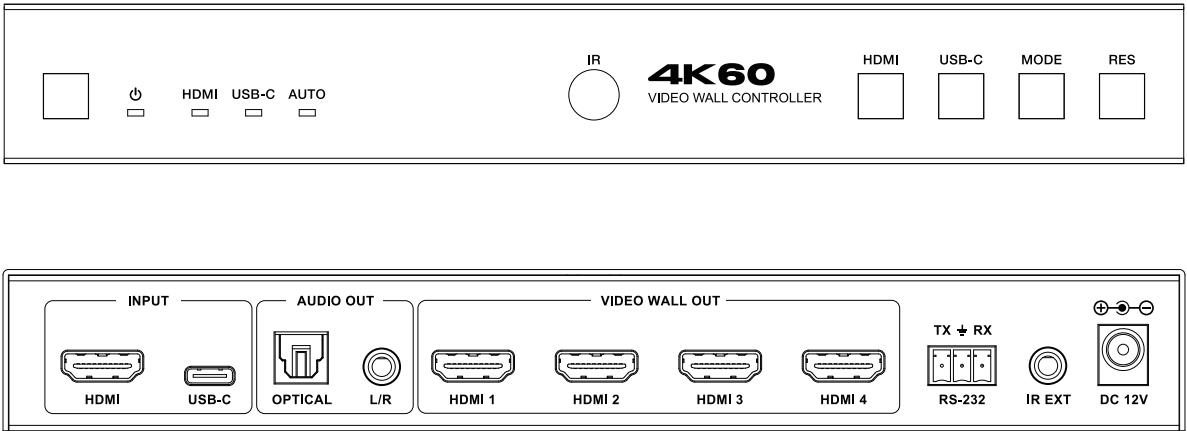


# USER MANUAL



## 4K60 2X2 Video Wall Controller with HDMI, with IR Control and RS232 Support

P/N 48163

## **Thank You for Purchasing This Product**

For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

## **Surge Protection Device Recommended**

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

## **Safety Warnings and Guidelines**

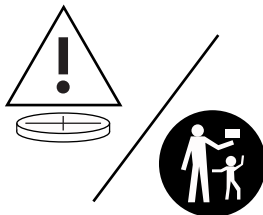
Please read this entire manual before using this device, paying extra attention to these safety warnings and guidelines. Please keep this manual in a safe place for future reference.

- This device is intended for indoor use only. Ensure all connected devices are properly grounded before use.
- Do not expose this device to water or moisture of any kind. Do not place drinks or other containers with moisture on or near the device. If moisture does get in or on the device, immediately unplug it from the power source and allow it to fully dry before reapplying power.
- Do not touch the device, the power cord, or any other connected cables with wet hands.
- Do not expose this device to excessive vibration. Do not subject the product to extreme force, shock, or fluctuations in temperature or humidity.
- Do not expose this device to excessively high temperatures. Do not place it in, on, or near heat sources, such as a fireplace, stove, radiator, etc. Do not leave it in direct sunlight.
- Do not place or install this device in an area where it can be exposed to excessive amounts of dust, humidity, oil, smoke, or combustible vapors.
- Place this device on a flat, stable surface to prevent falls and potential damage or malfunction.
- This device ventilates excessive heat through the slots and openings in the case. Do not block or cover these openings. Ensure that the device is in an open area where it can get sufficient airflow to keep from overheating.
- Do not insert metallic objects into any openings of the device, as this poses a risk of electric shock.
- Prior to operation, check the unit and power cord for physical damage. Do not use if physical damage has occurred.
- Before plugging the unit into a power outlet, ensure that the outlet provides the same type and level of power required by the device.



- Unplug this device from the power source when not in use.
- Take care to prevent damage to the power cord. Do not allow it to become crimped, pinched, walked on, or become tangled with other cords. Ensure that the power cord does not present a tripping hazard.
- Never unplug the unit by pulling on the power cord. Always grasp the connector head or adapter body.
- Ensure that power is turned off and disconnected before making any electrical connections.
- Clean using a soft, dry cloth only. Do not use chemical cleaners, solvents, or detergents. For stubborn deposits, moisten the cloth with warm water.
- This device has no user-serviceable parts. Do not attempt to open, service, or modify this device.

## Remote Control (Model): YKQ-206

|  <b>WARNING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• <b>INGESTION HAZARD:</b> This product contains a button cell or coin battery</li> <li>• <b>DEATH</b> or serious injury can occur if ingested.</li> <li>• A swallowed button cell or coin battery can cause <b>Internal Chemical Burns</b> in as little as <b>2 hours</b>.</li> <li>• <b>KEEP</b> new and used batteries <b>OUT OF REACH</b> of <b>CHILDREN</b></li> <li>• <b>Seek immediate medical attention</b> if a battery is suspected to be swallowed or inserted inside any part of the body.</li> </ul> |  |

- Remove and immediately recycle or dispose of used batteries according to local regulations and keep away from children. DO NOT dispose of batteries in household trash or incinerate.
- Even used batteries may cause severe injury or death. Call a local poison control center for treatment information.
- Identification of compatible battery type: CR2025
- Nominal battery voltage: 3V
- Non-rechargeable batteries are not to be recharged.
- Do not force discharge, recharge, disassemble, heat above manufacturer's specified temperature rating, or incinerate. Doing so may result in injury due to venting, leakage, or explosion resulting in chemical burns.
- Ensure the batteries are installed correctly according to polarity (+ and -).
- Do not mix old and new batteries, different brands or types of batteries, such as alkaline, carbon-zinc, or rechargeable batteries.

- Remove and immediately recycle or dispose of batteries from equipment not used for an extended period of time according to local regulations.
- Always completely secure the battery compartment. If the battery compartment does not close securely, stop using the product, remove the batteries, and keep them away from children.

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## 1. Introduction

The 4K60 2X2 Video Wall Controller is designed to realize truly capturing, AD converting, routing, and distributing all-format signal to the video wall (LCD displays), while maintaining a true digital signal transmission. It features HDMI and USB-C input with resolution up to 4K@60 4:4:4, and 4 HDMI outputs. It supports multiple video wall modes to be set for video output. Furthermore, optical audio and L/R analog audio de-embedding output are also supported.

It can be controlled via front panel buttons, IR remote and RS-232 commands.

## 2. Features

- HDCP 2.2 and DP 1.2a compliant
- Support video bandwidth up to 18Gbps, as specified in HDMI 2.0
- Support HDMI input and USB-C input, and the resolution is up to 4K@60Hz 4:4:4
- Support optical audio and L/R analog audio de-embedding output
- Support 8 video wall splicing modes: 1x1, 2x1, 3x1, 4x1, 1x2, 1x3, 1x4, 2x2
- Support image 180° rotation, convenient for ceiling installation
- Support bezel adjustment for the splicing edge
- Advanced EDID management
- Control via front panel buttons, IR remote and RS-232 commands
- Simple plug and play, no drive and installation setting are required

### 3. Package Contents

- ① 1 × 18Gbps 1x4 Video Wall Controller
- ② 1 × 12V/1A Locking Power Supply
- ③ 1 × Power Adapter
- ④ 1 × IR Remote
- ⑤ 1 × 5V IR Receiver Cable (1.5m)
- ⑥ 1 × 3pin-3.81mm Phoenix Connector (male)
- ⑦ 4 × Machine Screw (KM3\*4)
- ⑧ 2 × Mounting Ear
- ⑨ 1 × User Manual

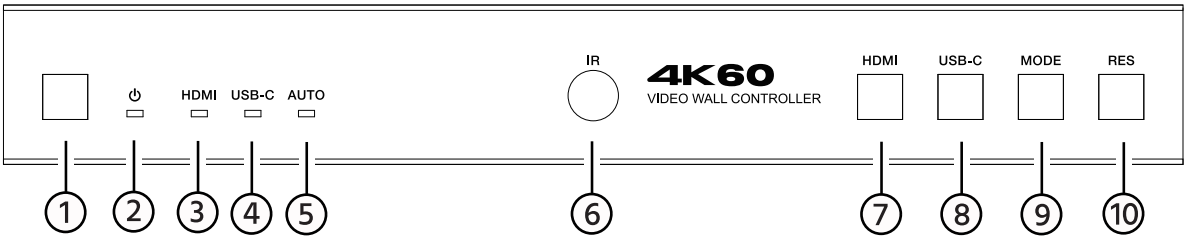
### 4. Specifications

| Technical        |                                                                                                                                                                           |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HDMI Compliance  | HDMI 2.0b                                                                                                                                                                 |
| HDCP Compliance  | HDCP 2.2                                                                                                                                                                  |
| Video Bandwidth  | 18Gbps                                                                                                                                                                    |
| Video Resolution | Input: up to 4K@60Hz 4:4:4<br>Output: 720P60Hz, 1080P60Hz, 4K30Hz, 1024x768P60Hz                                                                                          |
| Color Space      | RGB, YCbCr_4:4:4, YCbCr_4:2:2, YCbCr_4:2:0                                                                                                                                |
| Color Depth      | 8/10/12 bit                                                                                                                                                               |
| IR Level         | 5Vp-p                                                                                                                                                                     |
| IR Frequency     | 38KHz                                                                                                                                                                     |
| Audio Formats    | <b>HDMI IN/OUT:</b> LPCM 2.0/5.1, Dolby Digital/Plus/EX, DTS, DTS-EX, DTS-96/24<br><b>L/R OUT:</b> PCM 2.0<br><b>SPDIF(OPTICAL):</b> Dolby Digital/plus, DTS 5.1, PCM 2.0 |
| Audio Latency    | No Latency                                                                                                                                                                |
| Video Latency    | No Latency                                                                                                                                                                |

|                                                                   |                                                                                                      |          |          |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------|----------|
| ESD Protection                                                    | IEC 61000-4-2:<br>±8kV (Air-gap discharge) & ±4kV (Contact discharge)                                |          |          |
| Connection                                                        |                                                                                                      |          |          |
| Input Ports                                                       | 1 × HDMI INPUT [Type A, 19-pin female]<br>1 × USB-C INPUT [Type C, 24-pin female]                    |          |          |
| Output Ports                                                      | 4 × HDMI OUTPUT [Type A, 19-pin female]<br>1 × OPTICAL AUDIO OUT [S/PDIF]<br>1 × L/R AUDIO OUT [RCA] |          |          |
| Control Ports                                                     | 1 × RS-232 [3pin-3.81mm phoenix connector]<br>1 × IR EXT [3.5mm, Stereo Mini-jack]                   |          |          |
| Mechanical                                                        |                                                                                                      |          |          |
| Housing                                                           | Metal Enclosure                                                                                      |          |          |
| Color                                                             | Black                                                                                                |          |          |
| Dimensions                                                        | 220mm [W] × 100mm [D] × 30mm [H]                                                                     |          |          |
| Weight                                                            | 590g                                                                                                 |          |          |
| Power Supply                                                      | Input: AC 100-240V 50/60Hz, Output: DC 12V/1A<br>(US/EU standard, CE/FCC/UL certified)               |          |          |
| Power Consumption                                                 | 5.5W (Max)                                                                                           |          |          |
| Operating Temperature                                             | 32 - 104°F / 0 - 40°C                                                                                |          |          |
| Storage Temperature                                               | -4 - 140°F / -20 - 60°C                                                                              |          |          |
| Relative Humidity                                                 | 20 - 90% RH (no-condensing)                                                                          |          |          |
| Video Resolution                                                  | 4K60                                                                                                 | 4K24     | 1080P60  |
| HDMI Cable Length<br>(HDMI IN / OUT)                              | 8m/26ft                                                                                              | 10m/32ft | 15m/49ft |
| The use of “Premium High Speed HDMI” cable is highly recommended. |                                                                                                      |          |          |

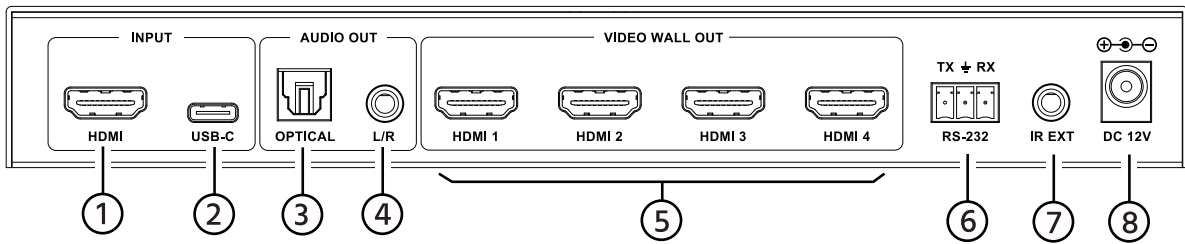
## 5.Operation Controls and Functions

### 5.1 Front Panel



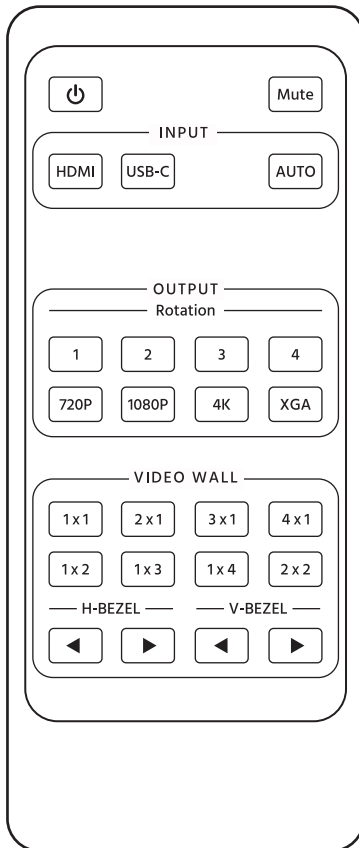
| NO. | Name         | Function Description                                                                                                                      |
|-----|--------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Power Button | In shutdown/standby status, press this button to power on; in power-on status, press this button for 2~3 seconds to enter standby status. |
| 2   | Power LED    | The LED will light in green when the product is working normally, and red when the product is on standby.                                 |
| 3   | HDMI LED     | The LED will light in green when HDMI input is selected.                                                                                  |
| 4   | USB-C LED    | The LED will light in green when USB-C input is selected.                                                                                 |
| 5   | AUTO LED     | The LED will light in green when auto switching is enabled.                                                                               |
| 6   | IR Window    | IR signal receiving window.                                                                                                               |
| 7   | HDMI Button  | Press this button to select the HDMI input channel.                                                                                       |
| 8   | USB-C Button | Press this button to select the USB-C input channel.                                                                                      |
| 9   | MODE Button  | Press this button to switch the 8 splicing modes circularly.                                                                              |
| 10  | RES Button   | Press this button to switch the resolutions of the four HDMI outputs circularly.                                                          |

## 5.2 Rear Panel



| NO. | Name                     | Function Description                                                                                                                                                                                                                                                                      |
|-----|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | HDMI INPUT               | HDMI signal input port, connected to an HDMI source device.                                                                                                                                                                                                                               |
| 2   | USB-C INPUT              | USB-C signal input port, connected to a USB-C source device.                                                                                                                                                                                                                              |
| 3   | OPTICAL AUDIO OUT        | Optical audio output port, connected to an audio output device such as an audio amplifier.                                                                                                                                                                                                |
| 4   | L/R AUDIO OUT            | Analog audio output port, connected to an audio output device such as a speaker.                                                                                                                                                                                                          |
| 5   | VIDEO WALL OUT (HDMI1~4) | HDMI signal output port, connected to TVs.                                                                                                                                                                                                                                                |
| 6   | RS-232                   | 3-pin phoenix connector, connected to a PC or control system for serial port upgrade or RS-232 command control.                                                                                                                                                                           |
| 7   | IR EXT                   | IR signal receiving port, connected with IR Receiver cable. If the IR signal receiving window of the unit is blocked or the unit is installed in a closed area out of infrared line of sight, the IR receiver cable can be inserted to the “IR EXT” port to receive the IR remote signal. |
| 8   | DC 12V                   | Connect to 12V/1A power adapter.                                                                                                                                                                                                                                                          |

## 6.IR Remote



### **Power On or Standby:**

Power on the device or set it to standby mode.

### **Mute:**

Turn off/on the audio output, including HDMI, Optical and L/R audio.

### **HDMI:**

Press to select HDMI input channel.

### **USB-C:**

Press to select USB-C input channel.

### **AUTO:**

Press to disable or enable the input auto switching.

### **Rotation 1/2/3/4:**

Press to switch rotation angle between 0° and 180° for the corresponding output channel.

### **Resolution 720P/1080P/4K/XGA:**

Press to switch the resolution for the 4 output channels at the same time.

### **Video Wall Mode:**

There are 8 splicing modes: 1x1, 2x1, 3x1, 4x1, 1x2, 1x3, 1x4, 2x2. Press to select the display mode.

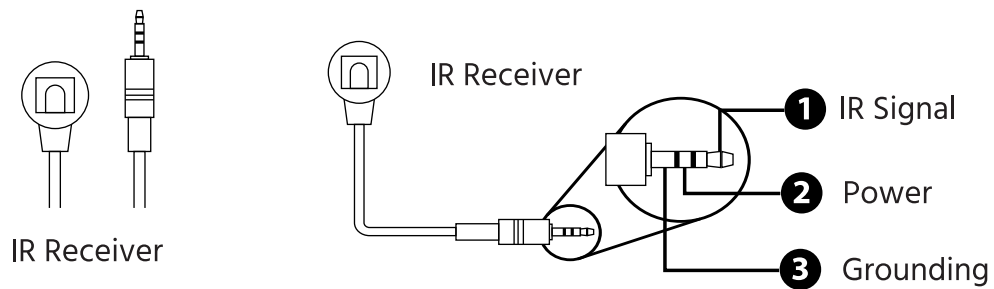
### **H/V-BEZEL ◀ ▶:**

Press to adjust the bezels of the splicing images.



## 7. IR Cable Pin Assignment

IR Receiver pin's definition is as below:



## 8. Video Wall

Video wall supports 8 splicing modes as below:

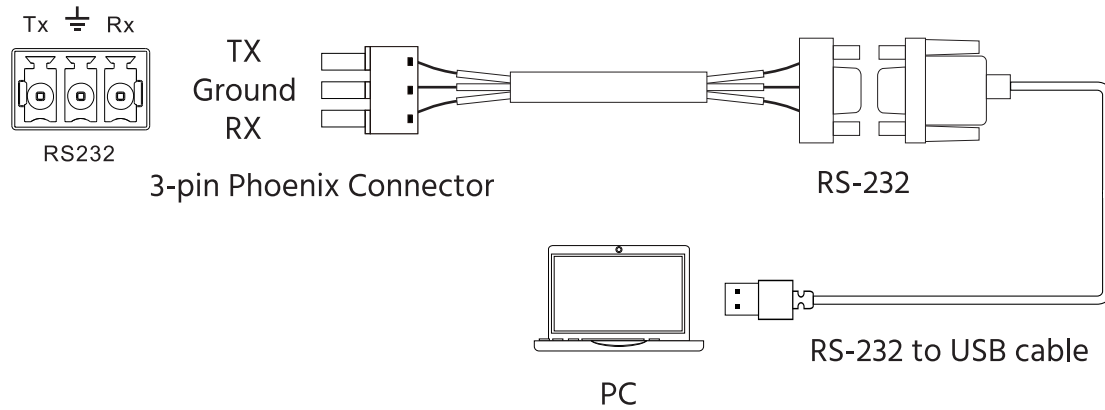


User can set display modes via front panel buttons, IR remote, and RS-232 commands.

**Note:** In the video wall mode (except mode 1x1), only the screens which are selected to perform video wall splicing will display images and their bezels can be adjusted.

## 9. RS-232 Control Command

The product also supports RS-232 command control. Connect the RS-232 port of the product to a PC with a 3-pin phoenix connector cable and an RS-232 to USB cable. The connection method is as follows.



Then, open a Serial Command tool on PC to send ASCII command to control the device.

The ASCII command list is shown as below.

| ASCII Command                                                                               |                           |           |                                                                          |                 |
|---------------------------------------------------------------------------------------------|---------------------------|-----------|--------------------------------------------------------------------------|-----------------|
| Serial port protocol. Baud rate: 115200 (Default), Data bits: 8, Stop bits: 1, Check bit: 0 |                           |           |                                                                          |                 |
| x - Parameter 1, y - Parameter 2, ! - Delimiter                                             |                           |           |                                                                          |                 |
| Command Code                                                                                | Function Description      | Example   | Feedback                                                                 | Default Setting |
| <b>System Setting</b>                                                                       |                           |           |                                                                          |                 |
| help!                                                                                       | List all commands         | help!     |                                                                          |                 |
| r status!                                                                                   | Get device current status | r status! | get the unit all status:<br>power, video wall mode, output resolution... |                 |
| r type!                                                                                     | Get device model          | r type!   | 1x4 video wall controller                                                |                 |

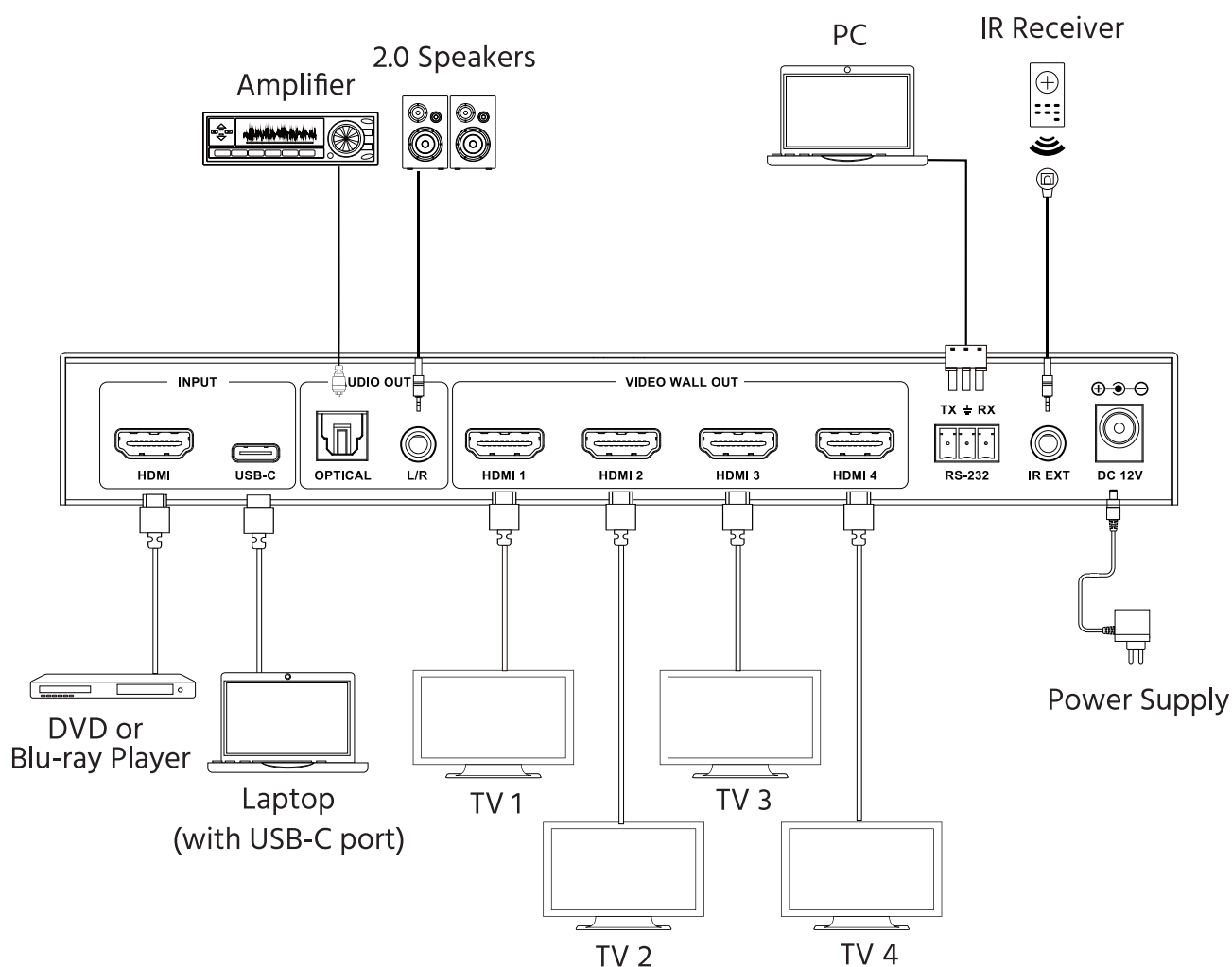
| Command Code          | Function Description                                            | Example                   | Feedback                                                                                                                                             | Default Setting                                                                                                                                                         |
|-----------------------|-----------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>System Setting</b> |                                                                 |                           |                                                                                                                                                      |                                                                                                                                                                         |
| r fw version!         | Get firmware version                                            | r fw version!             | mcu fw version :<br>x.xx.xx                                                                                                                          |                                                                                                                                                                         |
| s power z!            | Power on/off the device, z=0~1<br>(z=0 power off, z=1 power on) | s power 1!                | power on<br>system<br>initializing...<br>initialization<br>finished!<br>mcu fw version<br>x.xx.xx                                                    |                                                                                                                                                                         |
| r power!              | Get current power state                                         | r power!                  | power on /power off                                                                                                                                  |                                                                                                                                                                         |
| s reboot!             | Reboot the device                                               | s reboot!                 | reboot...<br>1x4 video wall<br>controller<br>system<br>initializing...<br>initialization<br>finished!<br>mcu fw version :<br>x.xx.xx                 |                                                                                                                                                                         |
| s reset!              | Reset to factory defaults                                       | 1x4 video wall controller | reset to factory defaults<br>1x4 video wall<br>controller<br>system<br>initializing...<br>initialization<br>finished!<br>mcu fw version :<br>x.xx.xx | 1.HDMI in;<br>2.EDID: 4K60<br>4:4:4 2ch;<br>3.audio mute off;<br>4.1x1 video wall mode;<br>5.1080p output;<br>6.All HDMI out no rotation;<br>7.H-Bezel=0,<br>V-Bezel=0; |

| Command Code          | Function Description                                                                                                                                                                                           | Example               | Feedback                            | Default Setting             |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------|-----------------------------|
| <b>Input Setting</b>  |                                                                                                                                                                                                                |                       |                                     |                             |
| s input x edid z!     | Set input x edid mode (x=0~2, z=1~6)<br>x=0. all input<br>x=1. input1<br>x=2. input2<br>z=1. 4k60, 2.0ch<br>z=2. 4k60, 5.1ch<br>z=3. 4k30, 2.0ch<br>z=4. 4k30, 5.1ch<br>z=5. 1080p, 2.0ch<br>z=6. 1080p, 5.1ch | s input 1 edid !      | input 1 edid: 4k60, 2.0ch           | 4k60, 2.0ch                 |
| r input x edid!       | Get input x edid mode (x=0~2)<br>x=0. all input<br>x=1. HDMI in<br>x=2. USB-C in                                                                                                                               | r input 1 edid!       | hdmi in edid: 4k60, 2.0ch           |                             |
| s output in source x! | Route input source to output ( x=1~2)<br>x=1. HDMI in<br>x=2. USB-C in                                                                                                                                         | s output in source 1! | output->hdmi in                     | output->HDMI in             |
| r output in source!   | Get output y selected input source                                                                                                                                                                             | r output in source!   | output->hdmi in                     |                             |
| <b>Output Setting</b> |                                                                                                                                                                                                                |                       |                                     |                             |
| s tw mode x!          | Set tv wall display mode (x=1~8)<br>x=1. 1x1 mode<br>x=2. 2x1 mode<br>x=3. 3x1 mode<br>x=4. 4x1 mode<br>x=5. 1x2 mode<br>x=6. 1x3 mode<br>x=7. 1x4 mode<br>x=8. 2x2 mode                                       | s tw mode 1!          | tv wall mode: 1x1                   | tv wall mode: 1x1           |
| r tw mode!            | Get tv wall display mode                                                                                                                                                                                       | r tw mode!            | tv wall mode: 2x2                   |                             |
| s tw h bezel +!       | Set tv wall horizontal bezel                                                                                                                                                                                   | s tw h bezel +!       | tv wall horizontal bezel: (bezel+1) | tv wall horizontal bezel: 0 |

| Command Code          | Function Description                                                                                                                             | Example              | Feedback                                                                                     | Default Setting                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <b>Output Setting</b> |                                                                                                                                                  |                      |                                                                                              |                                                                                              |
| s tw h bezel -!       | Set tv wall horizontal bezel                                                                                                                     | s tw h bezel -!      | tv wall horizontal bezel: (bezel-1)                                                          | tv wall horizontal bezel: 0                                                                  |
| s tw h bezel x!       | Set tv wall horizontal bezel (x=0~10)                                                                                                            | s tw h bezel 0!      | tv wall horizontal bezel: 0                                                                  | tv wall horizontal bezel: 0                                                                  |
| r tw h bezel!         | Get tv wall row bezel                                                                                                                            | r tw h bezel!        | tv wall horizontal bezel: 0                                                                  |                                                                                              |
| s tw v bezel +!       | Set tv wall vertical bezel                                                                                                                       | s tw v bezel +!      | tv wall vertical bezel: (bezel+1)                                                            | tv wall vertical bezel: 0                                                                    |
| s tw v bezel -!       | Set tv wall vertical bezel                                                                                                                       | s tw v bezel -!      | tv wall vertical bezel: (bezel-1)                                                            | tv wall vertical bezel: 0                                                                    |
| s tw v bezel x!       | Set tv wall vertical bezel (x=0~10)                                                                                                              | s tw v bezel 0!      | tv wall vertical bezel: 0                                                                    | tv wall vertical bezel: 0                                                                    |
| r tw v bezel!         | Get tv wall vertical bezel                                                                                                                       | r tw v bezel!        | tv wall vertical bezel: 0                                                                    |                                                                                              |
| s tw res x!           | Set tv wall resolution (x=1~4)<br>1.1280x720p60,<br>2. 1920x1080p60,<br>3. 3840x2160p30,<br>4. 1024x768@60 (XGA)                                 | s tw res 2!          | tv wall resolution: 1920x1080p60                                                             | tv wall resolution: 1920x1080p60                                                             |
| r tw res!             | Get tv wall resolution                                                                                                                           | r tw res!            | tv wall resolution: 1920x1080p60                                                             | tv wall resolution: 1920x1080p60                                                             |
| s output y rotate x!  | Set output y mirror (y=1~4, x=0,1)<br>y=1. output 1<br>y=2. output 2<br>y=3. output 3<br>y=4. output 4<br>x=0. 0° rotation<br>x=1. 180° rotation | s output 1 rotate 0! | output1: 0° rotation                                                                         | output1: 0° rotation<br>output2: 0° rotation<br>output3: 0° rotation<br>output4: 0° rotation |
| r output y rotation!  | Get output y mirror status (y=0~4)<br>y=0. output all<br>y=1. output 1<br>y=2. output 2<br>y=3. output 3<br>y=4. output 4                        | r output 0 rotation! | output1: 0° rotation<br>output2: 0° rotation<br>output3: 0° rotation<br>output4: 0° rotation |                                                                                              |

| Command Code           | Function Description                                              | Example                | Feedback               | Default Setting |
|------------------------|-------------------------------------------------------------------|------------------------|------------------------|-----------------|
| <b>Output Setting</b>  |                                                                   |                        |                        |                 |
| s output audio mute x! | Set output audio mute on/off (x=0~1)<br>0. mute off<br>1. mute on | s output audio mute 0! | output audio mute: off | off             |
| r output audio mute!   | Get output audio mute on/off                                      | r output audio mute!   | output audio mute: off |                 |

## 10. Application Example



**HDMI**<sup>TM</sup>  
HIGH-DEFINITION MULTIMEDIA INTERFACE

The terms HDMI and HDMI High-Definition Multimedia interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.

## Notice for FCC



This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Modifying the equipment without Manufacturer's authorization may result in the equipment no longer complying with FCC requirements for Class B digital devices. In that event, your right to use the equipment may be limited by FCC regulations, and you may be required to correct any interference to radio or television communications at your own expense.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.