# MV71-4K

## 4K 7x1 Multiviewer Switcher



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**Version: 79064_2020V1.0**

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## Preface

Read this user manual carefully before using the product. Pictures shown in this manual are for reference only. Different product model specifications may vary.

This manual is only for operation instruction, please contact the local distributor for maintenance assistance. The functions described in this version are recent as of January 2015. In order to continue improving the product, we reserve the right to make function or parameter changes without notice or obligation. Please refer to the dealers for the latest details.

## Trademarks

Product model and logo are trademarks. Any other trademarks mentioned in this manual are acknowledged as the properties of the trademark owner. No part of this publication may be copied or reproduced without prior written consent.

## FCC Statement

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. It has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.

## Safety Precautions

To ensure the best performance from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully, and save the original box and packing material for possible future shipment
- Follow basic safety precautions to reduce the risk of fire, electrical shock, and injury to persons
- Do not dismantle the housing or modify the module (electrical shock or burn hazard)
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration, or malfunction
- Refer all servicing to qualified service personnel
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water
- Do not put any heavy items on the product's power cable
- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards
- Install the device in a place with sufficient ventilation to avoid damage caused by overheating
- Keep the module away from liquids
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not twist or pull by force ends of the optical cable. It can cause malfunction.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Unplug the power cord when left unused for a long period of time
- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes

# Table of Contents

# 1. Getting Started

## 1.1 Panel Layout

### 1.1.1 Front Panel
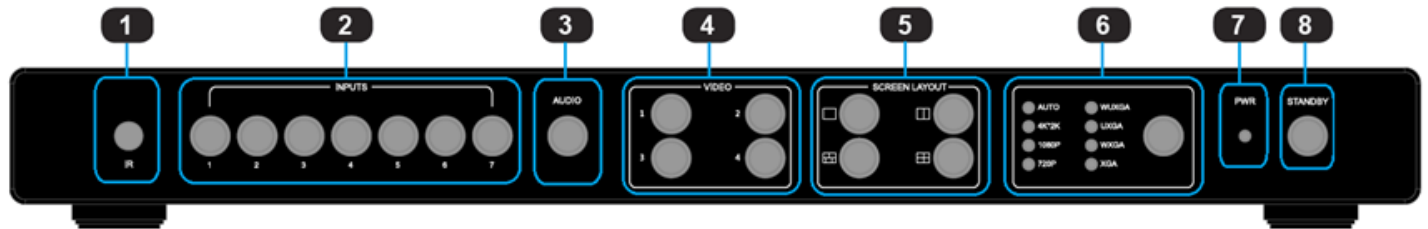


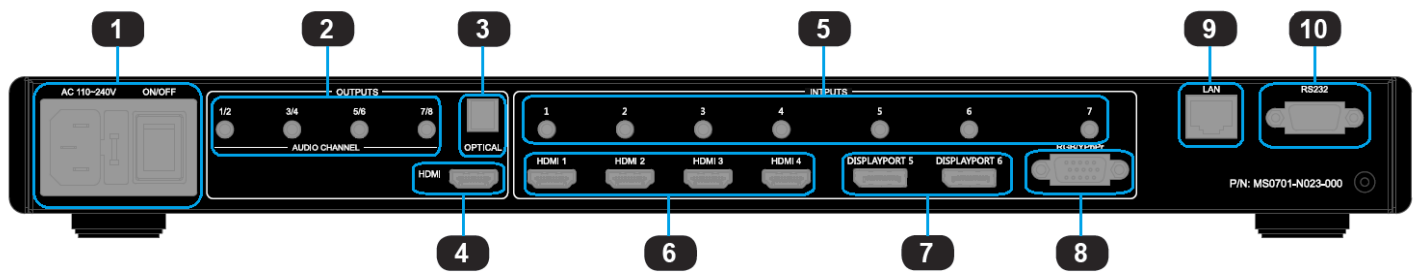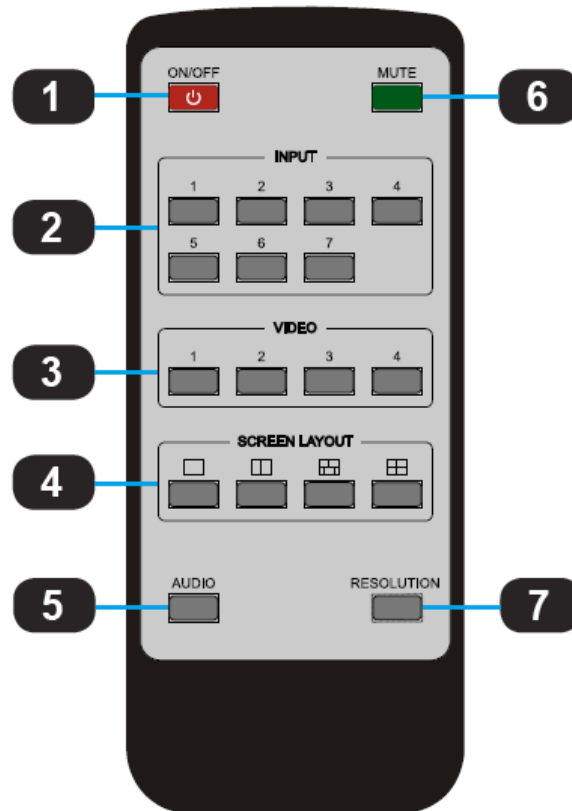| ID | Name | Description |
|----|------|-------------|
| 1 | IR receive window | IR receive sensor, receives the IR signals from the IR remote. |
| 2 | Input Buttons and Indicator | Press buttons 1-7 to select the corresponding video or audio input. The indicators mean the corresponding status of the video or audio input. |
| 3 | Audio Selection Button and Indicator | Press this button for the indicator to light up; this represents switching between audio outputs. |
| 4 | Video Input Button and Indicator | Press buttons 1-4 which indicates the selected corresponding windows. The indicates whether this window is active. |
| 5 | Video Window Mode Button and Indicator | Video window mode selection: single window, double windows, triple windows, and quadruple windows. The indicators mean whether this window is active. |
| 6 | Output Resolution Button and Indicator | Selects the related resolutions |
| 7 | Power Indicator | Indicates whether the power is working properly or not. |
| 8 | Standby button and indicator | • Switches between standby and normal work modes.<br>• When this device is switched to the standby mode, the indicator lights up. |

## 1.1.2 Back Panel



| ID | Name | Description |
|---|---|---|
| 1 | Power Switch and 110/220 AC Power Receptacle | Turn the power ON or OFF using this switch. Connect the included AC power cord to this receptacle and connect the plug to an available electrical outlet. |
| 2 | Analog audio output | 8 channel analog audio output. Connect a 3.5mm mini-stereo cable from this jack to the "Line In" jack of a multimedia system. |
| 3 | Optical output | Connect the optical output port to the digital audio input port of your amplifier |
| 4 | HDMI output | Connect an HDMI cable from this port to an HD or 4K display. |
| 5 | Analog audio input 1 ~ 7 | 7 channel stereo analog audio input. Connect a 3.5mm mini-stereo cable from the Line Out jack on the audio source to this jack. |
| 6 | HDMI input 1 ~ 4 | Connect up to four Hi-Def sources to these inputs using HDMI cables. |
| 7 | DisplayPort input 1 ~ 2 | Connect up to two Hi-Def sources to these inputs using DisplayPort cables. |
| 8 | RGB/YPbPr input | Connect up to a Hi-Def sources to this input using DB-15 cable or YPbPr-VGA cable. |
| 9 | IP Cont. | Connect an Ethernet cable between this jack and a LAN to use IP control. Refer to RS-232 and IP Configuration for more information on setting up IP control. |
| 10 | RS-232 | Connect an RS-232 cable from this port to an RS-232 device. See RS-232 and IP Configuration for more information on setting up RS-232 control. |

## 1.2 IR Remote Control Unit

### 1.2.1 Button Layout
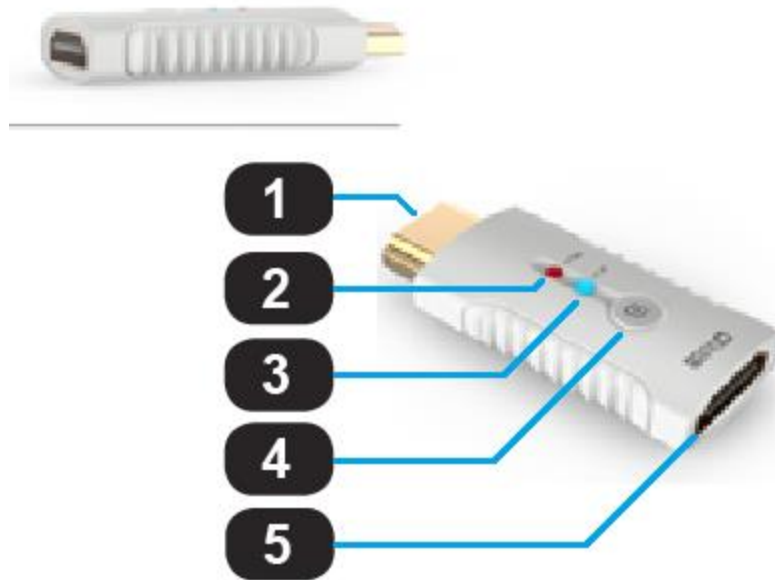


| ID | Name | Description |
|----|------|-------------|
| 1 | Power | Power the multiviewer switcher On or Off |
| 2 | Input 1 ~ 7 | Press "1-7" buttons to select the corresponding video input or audio input |
| 3 | Windows 1 ~ 4 | Press "1-7" buttons to select the corresponding window for select video input |
| 4 | Screen Layout | Select Single mode, Double mode, Triple mode, or Quadruple mode |
| 5 | Audio | Press this button and then press the "1-7" buttons to select the corresponding audio input |
| 6 | Mute | Mute or Un-Mute the multiviewer switcher audio output |
| 7 | Resolution | Change the multiviewer switcher HDMI output resolution |

## 1.3 HDMI/DP Cable Switcher (Optional)



| ID | Name | Description |
|----|------|-------------|
| 1 | HDMI/DP Output | Connect up to 4k or Hi-Def HDMI/DP sources |
| 2 | Power Indicator | Indicates the power indicator. |
| 3 | Link Indicator | Indicates the connection status indicator. |
| 4 | Switch Button | Presses this button Multiviewer Switcher to switch to this signal port. |
| 5 | HDMI/DP Input | Connects to the HDMI or DisplayPort ports of Multiviewer Switcher using the HDMI cables. |

## 1.4 Installation

### 1.4.1 How to Connect the Multiviewer Switcher

1) Connect up to four HD HDMI sources to the input ports (HDMI 1 - HDMI 4), Connect up to two 4K or HD DisplayPort sources to the input ports (DISPLAYPORT 5 - DISPLAYPORT 6), Connect up to one Hi-Def VGA or YPbPr sources to the input ports (RGB/YPbPr) on the Multiviewer Switcher

2) Connect an 4K or HD display to the HDMI Output port on the Multiviewer Switcher

3) **OPTIONAL**: Connect up to seven stereo analog audio sources to audio input ports (1-7) on the Multiviewer Switcher.

4) **OPTIONAL**: Connect the HDMI/DP input port of HDMI/DP cable switcher to the 4K or HD source device. Connect the HDMI/DP input port of Multiviewer Switcher to the HDMI/DP output port of HDMI/DP cable switcher using HDMI or DP cables.

5) **OPTIONAL**: Connect four 3.5mm mini-stereo cables from the jacks on the Multiviewer Switcher to the "Line In" jack of a multimedia system, or connect an optical cable from the OPTICAL on the Multiviewer Switcher to the "Optical In" of a multimedia system.

6) **OPTIONAL**: Connect an RS-232 cable from the RS-232 port on the Multiviewer Switcher to the RS-232 connector on the serial controller.

7) **OPTIONAL**: Connect an Ethernet cable from the LAN port on the Multiviewer Switcher to a Local Area Network (LAN).

8) Connect the AC power cord to the Multiviewer Switcher and connect the plug to an available electrical outlet.

### 1.4.2 Wiring Diagram
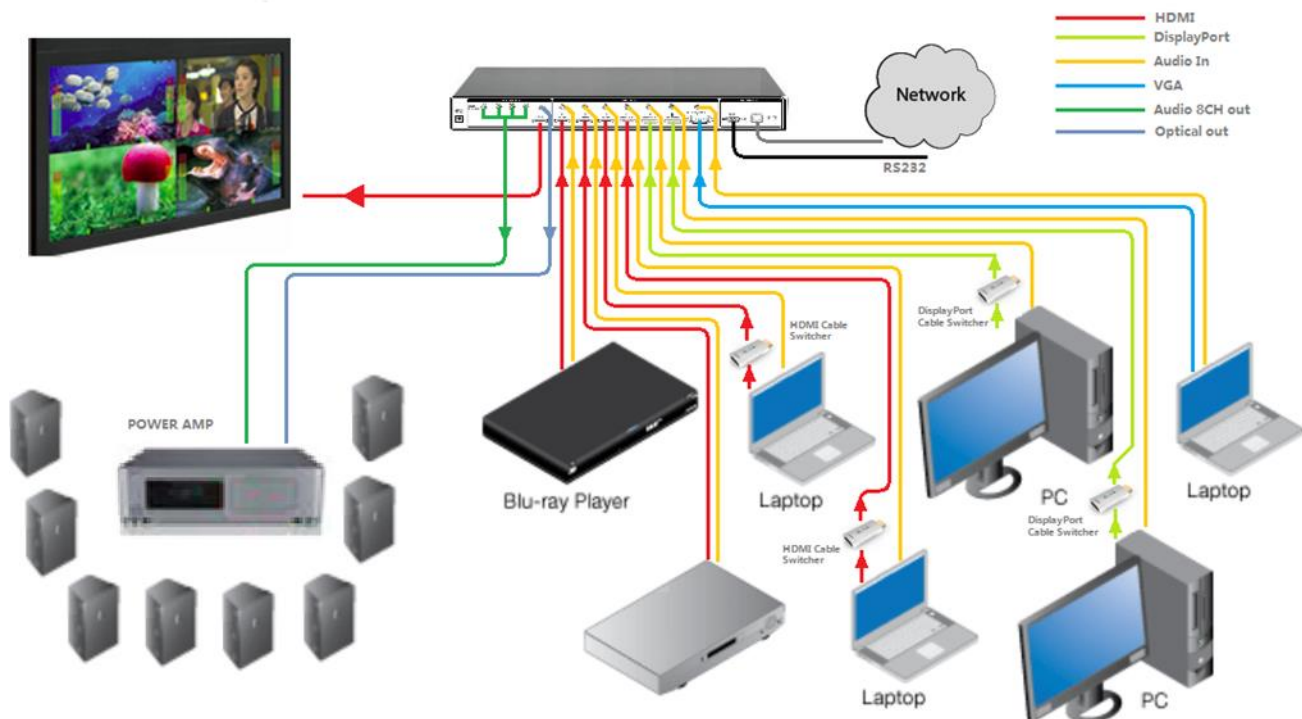


## 2. Operation

### 2.1 Standby Mode & Operational Mode

The "PWR" LED next to the Power button on the front panel indicates the power state of the Multiviewer Switcher. This indicator remains illuminated as long as power is being supplied to the Multiviewer Switcher. If this indicator does not illuminate, check the connection between the power receptacle on the Multiviewer Switcher and the AC outlet.

In Standby mode the Standby indicator will light up until the Multiviewer Switcher wakes up. When the normal work mode is used, the Standby indicator will turn off. There three methods to wake up the device include the following: pressing the Standby button, pressing the ON/OFF button on the IR remote or using LAN or RS232 commands.

# MV71-4K
## 79064 User Manual
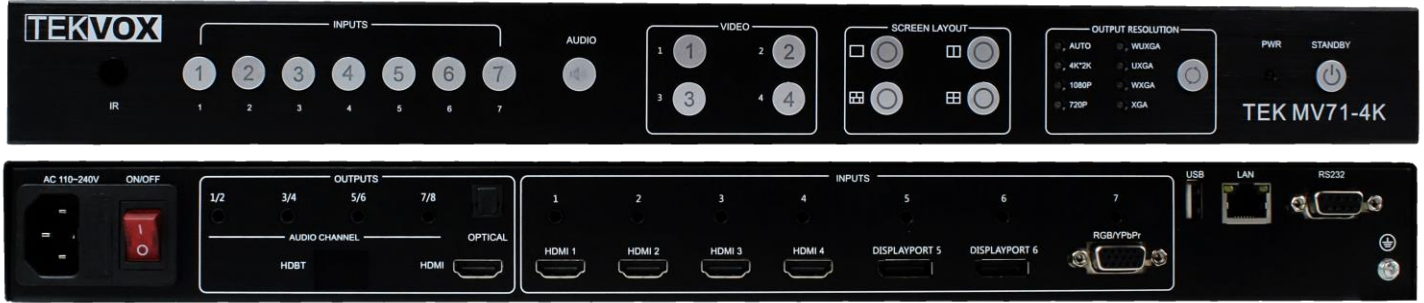


## 2.2 Screen Layout & Configuration
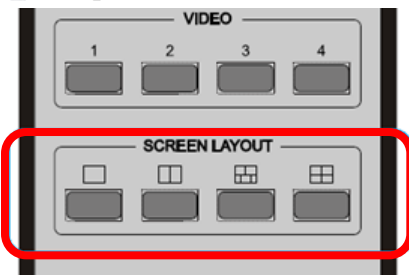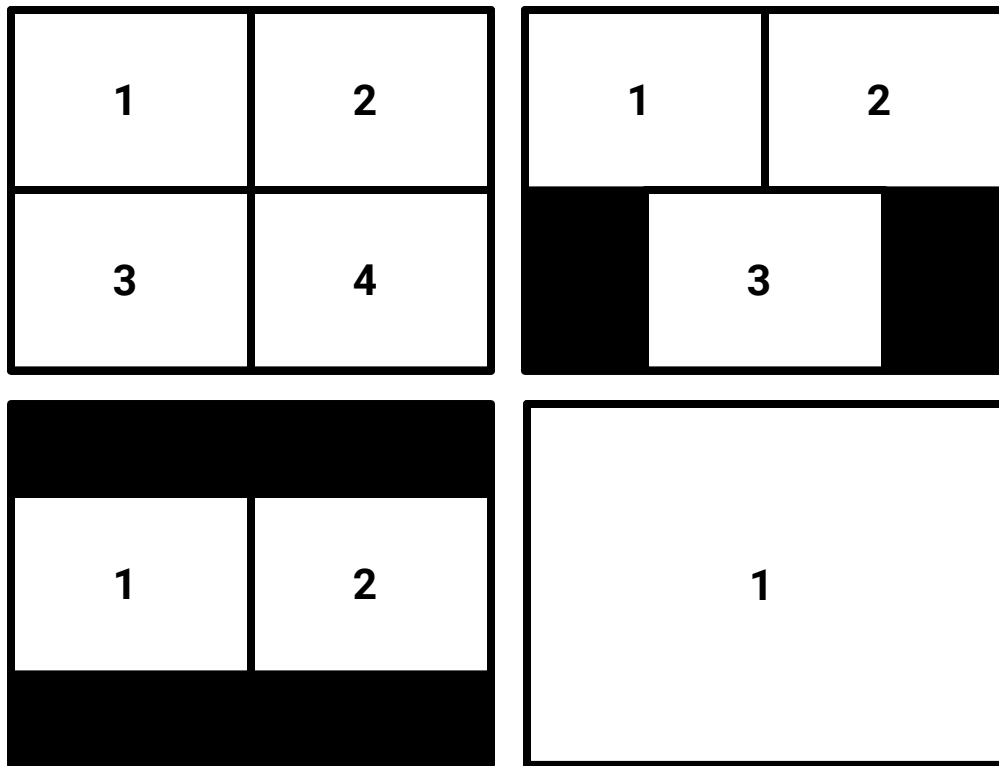




Press the four buttons in the Screen Layout of the Multiviewer Switcher, corresponding to the four modes above. For example, if you want to use the mode for quadruple windows, press the button so that the icon is displayed or the button in the remote. The button indicator on the panel will light up, and the picture output on the display device through HDMI will show quadruple windows. Meanwhile, the video 1-4 indicators will light up.

The Multiviewer Switcher can display up to four sources. When multiple sources are displayed on the screen, each source is regarded as a single window, and each window is defined as an input. However, we want to define the operation in the single window to introduce the basic operation before introduction to the operation in multiple windows. In the following example, seven HD sources (each displayed as a single picture) are connected to Multiviewer Switcher. When the Multiviewer Switcher is delivered from the factory, the default boot settings are loaded automatically (see below).

**2.2.1 Single Window**

1) Use the "☐" button on the front panel remote to set to the single window mode. When the Video 1 button indicator lights up, the Input 1 indicator will light up.





2) The HDMI output configures the HDMI 1 input. The window is shown as follows:

3) If you want to switch to the signal of DisplayPort5:

   **Method 1**: Press the INPUTS 5 button on the front panel or remote.
   **Method 2**: Press the Video 1 button on the front panel or remote.
   The 1 button indicator on the panel will turn solid and the 2-7 button indicators will blink. If an indicator is static, it means that the source is currently selected. If an indicator is blinking, it means that the source can be selected.



4) When the 5 button indicator lights up, the panel status is shown as follows:

5) The HDMI output picture is changed to the signal of DisplayPort5.
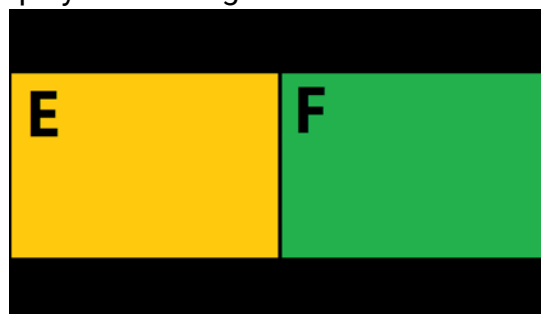
**2.2.2 Double Windows**

1) Use the "▢▢" button on the front panel or remote to set the mode to double windows. This will turn the Video 1 and 2 indicators on.



2) The HDMI output port outputs the mode of double windows. Window 1 is configured to the HDMI 1 input (HDMI1 is the factory default. If any changes are made, use the last configuration). Window 2 is configured to HDMI2 input (HDMI2 is the factory default. If any changes are made, use the last configuration). The windows are shown as follows:
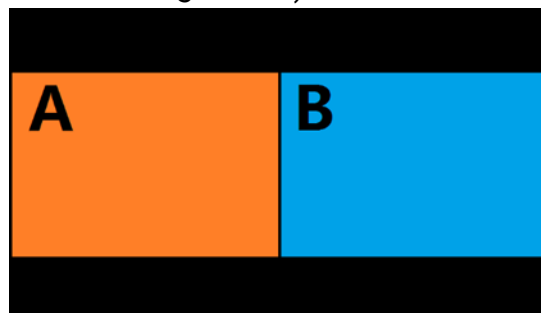


3) For example, if you want to switch to Window 1 the signal of DisplayPort5:
**Method 1:** Press the INPUTS 5 button on the front panel or remote. The Video 1 and 2 button indicators will blink (this indicates that the two buttons can be selected). Press the Video 1 button on the front panel or remote to select Window 1.
**Method 2:** First press the Video 1 button on the front panel or remote. The 1 button indicator on the panel will become solid. If the 2-7 button indicators are blinking (If an indicator is static, it means the source currently selected; If an indicator is blinking, it means this source can be selected). Press the INPUTS 1 button on the front panel or in the remote.

4) Windows 2 can select DisplayPort6 using the same method.



5) The HDMI output picture is changed to the status below.

## 2.2.3 Triple Windows

1) Use the "⊞" button on the front panel or remote to set to the mode of triple windows. The Video 1, 2, and 3 button indicators on the front panel will light up.



2) The HDMI output port outputs the mode of triple windows. Window 1 is configured to HDMI1 input (HDMI1 is the factory default. If any changes are made, use the last configuration); Window 2 is configured to HDMI2 input (HDMI2 is the factory default. If any changes are made, use the last configuration). Window 3 is configured to HDMI3 input (HDMI3 is the factory default. If any changes are made, use the last configuration). The windows are shown as follows:
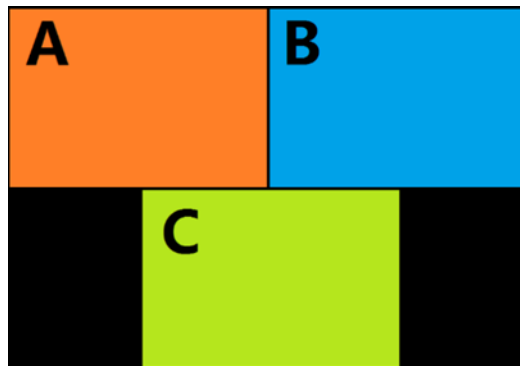


3) If you want to switch to Window 1 and the DisplayPort5 signal:
   **Method 1:** Press the INPUTS 5 button on the front panel or remote. The Video 1 and 2 button indicators blink (indicates the two buttons can be selected), press the Video 1 button on the front panel or in the remote to select Window 1.

4) **Method 2:** Press the Video 1 button on the front panel or remote. The 1 button indicator on the panel turns solid on, 2-7 button indicators will blink (If an indicator is static, it means the source currently selected. If an indicator is blinking, it means this source can be selected), press the INPUTS 1 button on the front panel or in the remote.

5) Using the same methods, Window 2 can select DisplayPort6 and Window 3 can select RGB/YPbPr.

6) The HDMI output picture is changed to the following status.

### 2.2.4 Quadruple Windows

1) Use the "⬚" button on the front panel or remote to set to the mode of quadruple windows. The Video 1, 2, 3, and 4 button indicators on the front panel will light up.



2) HDMI output port outputs the mode of quadruple windows. Window 1 is configured to HDMI1 input (HDMI1 is the factory default. If any changes are made, use the last configuration); Window 2 is configured to HDMI2 input (HDMI2 is the factory default. If any changes are made, use the last configuration); Window 3 is configured to HDMI3 input (HDMI3 is the factory default. If any changes are made, use the last configuration); Window 4 is configured to HDMI4 input (HDMI4 is the factory default. If any changes are made, use the last configuration). The windows are shown as follows:
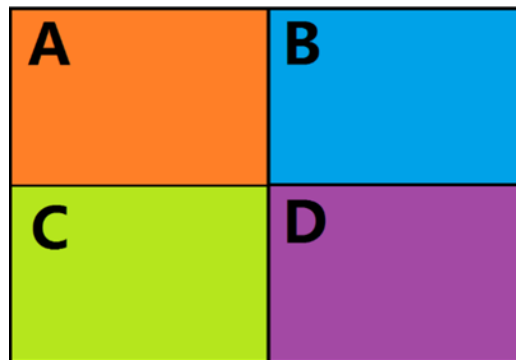


3) If you want to switch to Window 1 switch the signal of DisplayPort5, use one of the following methods:
**Method 1:** Press the INPUTS 5 button on the front panel or remote, the Video 1 and 2 button indicators blink (indicates the two buttons that can be selected), press the Video 1 button on the front panel or in the remote to select Window 1.

4) **Method 2:** Press the Video 1 button on the front panel or remote, the 1 button indicator on the panel turns solid, 2-7 button indicators are blinking (If an indicator is solid on, it means the
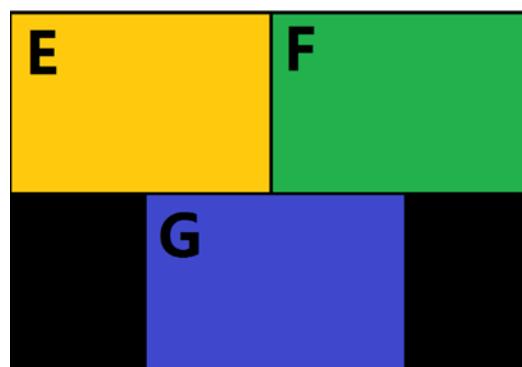


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source currently selected; If an indicator is blinking, it means this source can be selected). Press the INPUTS 1 button on the front panel or in the remote.

5) In the same methods, Window 2 can select DisplayPort6, and Window 3 can select RGB/YPbPr.
6) HDMI output picture is changed to the following status.
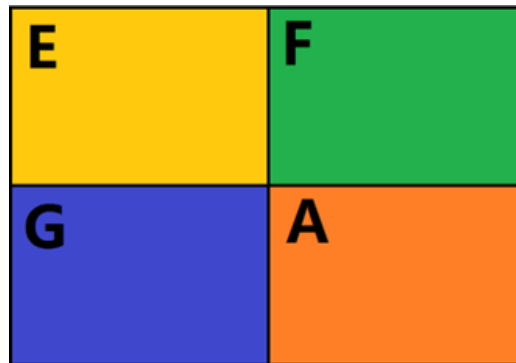


## 2.3 Output Resolution

HDMI output resolutions support multiple modes with the indicator indication.

- Auto
- 4K * 2K (3840 x 2160 @ 30Hz)
- 1080P (1920 x 1080 @ 60Hz)
- 720P (1280 x 720 @ 60Hz)
- WUXGA (1900 x 1200 @ 60Hz)
- UXGA (1600 x 1200 @ 60HZ)
- WXGA (1280 x 800 @ 60Hz)
- XGA (1024 x 768 @ 60Hz)

Auto means that the output of the HDMI resolutions is based on the EDID information read from the display device.

**Operation method:**
Press the Resolution buttons on the panel or remote to switch between different HDMI output resolutions. The switching sequence is as follows: Auto -> 4K x 2K -> 1080P -> 720P -> WUXGA -> UXGA -> WXGA -> XGA -> Auto. When a resolution is selected, the corresponding indicator will light up and the HDMI output will switch to the new resolution.

## 2.4 Audio Setting

The MV71 supports breakaway audio and requires the audio to be selected separately from the video.

### 2.4.1 Audio Input Selection

The audio also has seven inputs. When the video input is selected as HDMI or DisplayPort, the audio will input from HDMI or DP. If the HDMI or DP input has no audio, the audio input will come from the corresponding 3.5 mm earphone jack. For example, if the DVI signal is transmitted through HDMI1, the audio will input from the 3.5mm earphone jack of the audio output 1 (above the HDMI1 port). VGA video corresponds to the 3.5mm jack of the audio output 7.



Operations for audio switching:

**Method 1:**

1) Press audio button. The corresponding indicator will light up. This means that the audio output is selected. If the Input indicator of the corresponding audio source turns static, the other indicators will blink.

2) Press the Inputs button. The audio will switch to this channel. At the same time, the Input indicators and audio indicator are off.

3) If no further operation is performed within 5 seconds during Step 2, it will exit from this status.

**Method 2:**

1) Press the audio button. The corresponding indicator will light up, which means that the audio output is selected. When the Input indicator of the corresponding audio source turns static, the other indicators will blink.

2) Press the desired "Inputs" button and the audio will switch to this channel. At the same time, the Input indicators and audio indicator will turn off.

3)  If no further operation is performed within 5 seconds during Step 2, it will exit from this status.

**Notes:**
Press the audio button and the "Inputs" indicator of the corresponding audio source will become solid while the other indicators blink. This will confirm the current audio selected channel.

HDMI and DisplayPort have a 3.5mm stereo audio jack. If HDMI or DisplayPort input signals have audio format, then the digital audio signal is used. If these signals are without audio format, then it will automatically switch to the 3.5mm analog input.
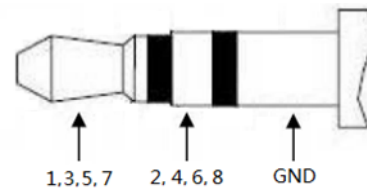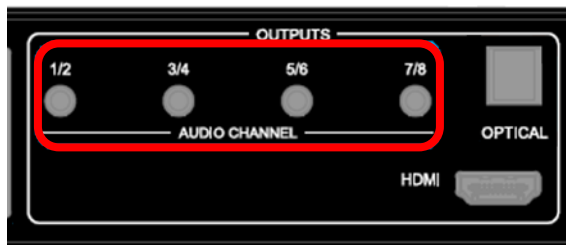


| Audio Format | Channel | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2.0 | L | R | | | | | | |
| 2.1 | L | R | LFE | | | | | |
| 5.1 | FL | FR | LFE | FC | RL | RR | | |
| 7.1 | FL | FR | LFE | FC | RL | RR | RLC | RRC |

## 2.4.2 Audio Output Selections

There are three methods of audio output:
   1. HDMI output
   2. Optical output
   3. Analog output, 8 channels for audio output
If the input audio format is stereo, then "½" audio output is used. If the audio format is 5.1, then channels from 1 to 6 output the audio.

## 2.5 OSD Settings Instructions

The On Screen Display (OSD) will show when inputs or volume levels are changed. These ODS images can be turned off using control commands.

Each window displays an input source, the resolution of the input signal, and whether or not there is no HDMI cable, no HDMI signal, or no HDMI/DisplayPort/VGA.
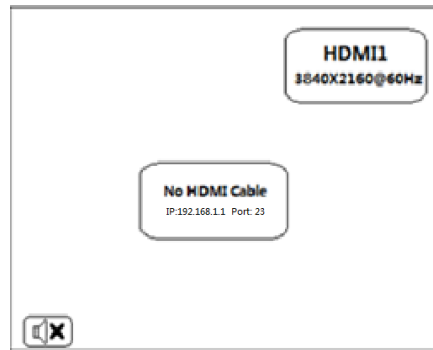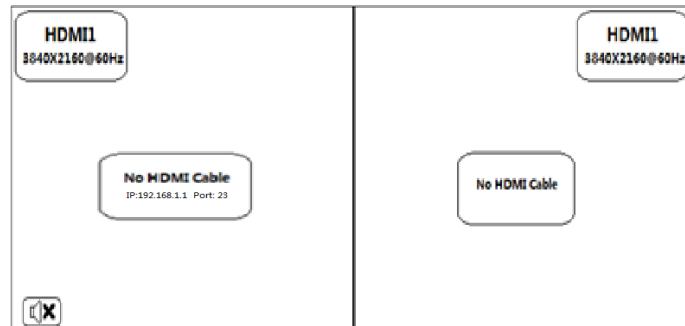
**Single window:**

```
                    ┌─────────────────┐
                    │   HDMI1         │
                    │ 3840X2160@60Hz  │
                    └─────────────────┘

          ┌─────────────────┐
          │  No HDMI Cable   │
          │ IP:192.168.1.1 Port: 23 │
          └─────────────────┘

  ⊲✕
```

**Double Windows:**

```
  ┌─────────────┐              ┌─────────────┐
  │   HDMI1     │              │   HDMI1     │
  │3840X2160@60Hz│             │3840X2160@60Hz│
  └─────────────┘              └─────────────┘

       ┌─────────────────┐         ┌─────────────┐
       │  No HDMI Cable   │         │ No HDMI Cable│
       │IP:192.168.1.1 Port: 23│    └─────────────┘
       └─────────────────┘

  ⊲✕
```

**Triple Windows:**

```
  ┌─────────────┐              ┌─────────────┐
  │   HDMI1     │              │   HDMI1     │
  │3840X2160@60Hz│             │3840X2160@60Hz│
  └─────────────┘              └─────────────┘

     ┌─────────────────┐          ┌─────────────┐
     │  No HDMI Cable   │          │ No HDMI Cable│
     │IP:192.168.1.1 Port: 23│     └─────────────┘
     └─────────────────┘

            ┌─────────────┐
            │   HDMI1     │
            │3840X2160@60Hz│
            └─────────────┘

               ┌─────────────┐
               │ No HDMI Cable│
               └─────────────┘

  ⊲✕
```

**Quadruple Windows:**

| HDMI1 3840X2160@60Hz | HDMI1 3840X2160@60Hz |
|---|---|
| No HDMI Cable IP:192.168.1.1 Port: 23 | No HDMI Cable |
| **HDMI1** 3840X2160@60Hz | HDMI1 3840X2160@60Hz |
| No HDMI Cable | No HDMI Cable |
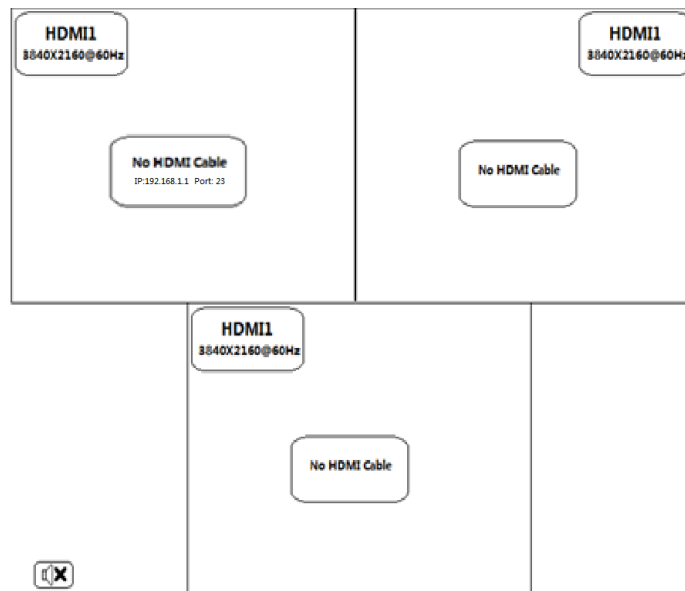
**Audio Mute Indicators:**

**Volume Adjustment:**

5

**VGA Auto Menu:**

Auto Adjust

**IP Address:**

IP :192.168.1.1
Port: 23
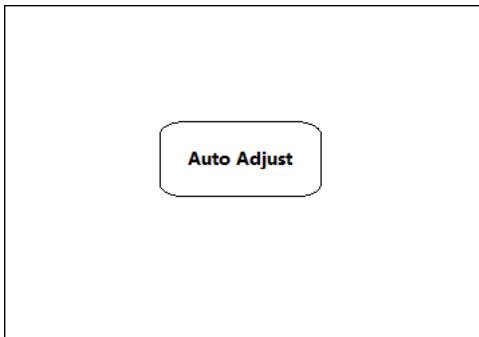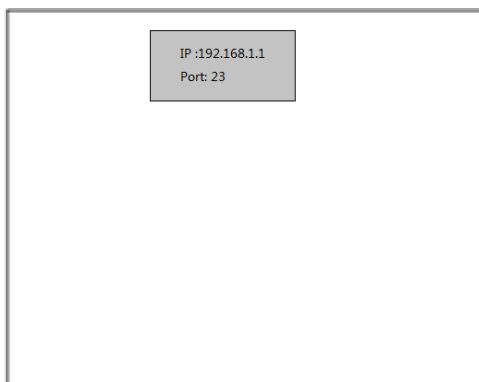
# 3. Advanced Settings

## 3.1 RS232 Settings

**RS-232 port (DB-9):**



**Note**: Connect to RXD, TXD, and GND only

**RS-232 Settings**:

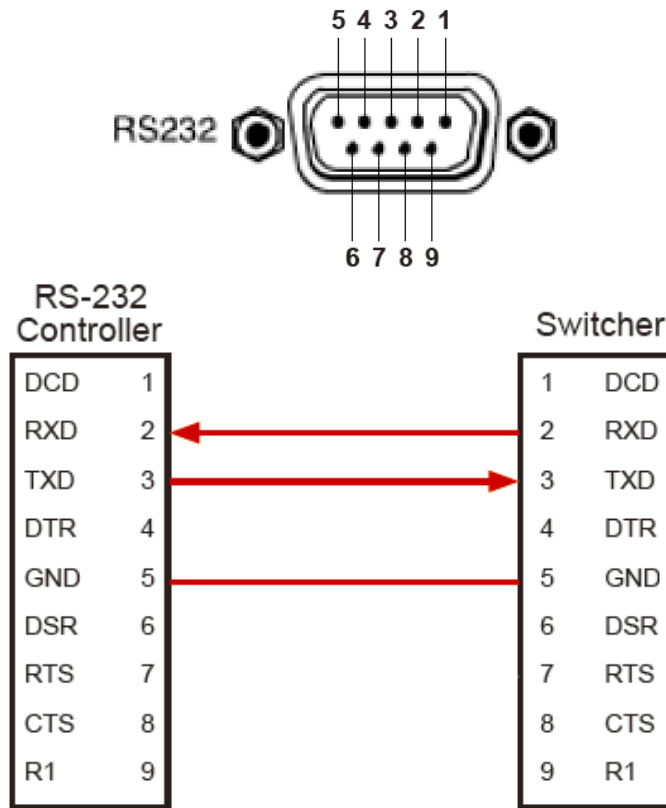| Description | Setting |
|---|---|
| Baud Rate | 9600 |
| Data Bits | 8 |
| Parity | None |
| Stop Bits | 1 |
| Hardware Flow Control | None |

**Note**: For more information about serial command lines, see the *Command List* chapter

## 3.2 IP Settings

MV71 supports IP control, Telnet, UTP, and so on. There are two methods to obtaining the IP address:

1. Obtain the IP address and port number via the information from the on-screen display (OSD).
2. Obtain the IP address and port number via SmartGui.

The following presents the two methods:
Obtain the IP address and port number via the information from the OSD.
Whether MV71 is in single-window mode or in multiple window mode, IP address and port number can always be obtained from Window 1. When there is no signal, the following OSD in the window is displayed:
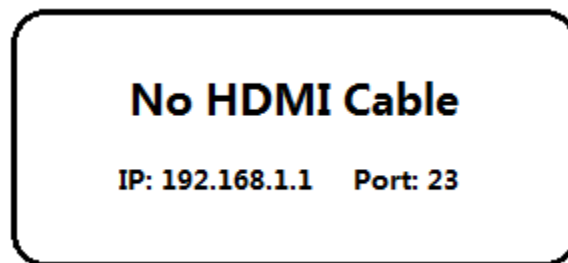


When the picture is displayed, the IP information is displayed in the area above the middle of the window.
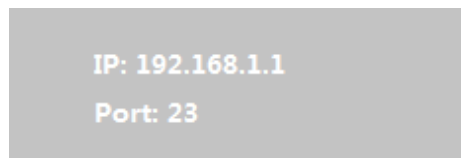


In this example, the IP address is 192.168.1.1 and the port number is 23.

Obtain the IP address and port number via SmartGui.
Start SmartGUI on the PC. The software interface is shown as follows:



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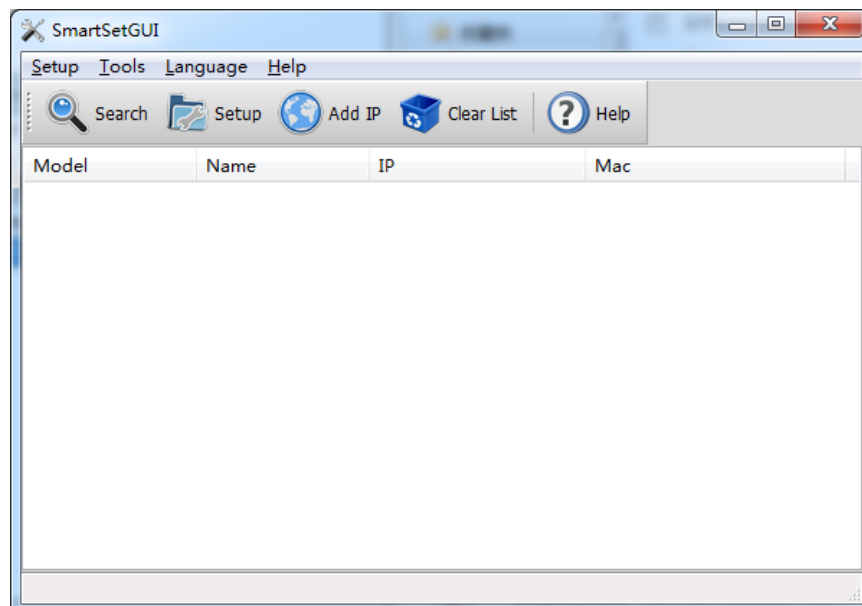
Make sure that the PC and MV71 are in the same network segment. Click **Search**. The following device list is shown:



Select the device, and click **Setup**. The IP information is obtained from the **Device Info** page:
**IP：192.168.3.7  Port：23**

## 3.3 Command List

The MV71 is controlled or operated through the commands from RS232 or IP. The command contains the following:

- Source Control
- Advanced Control
- EDID Management

**Command header**: ATM
**Length**: ≤ 255
**Command**: xxxxxxx
**Read/Write**: W/R
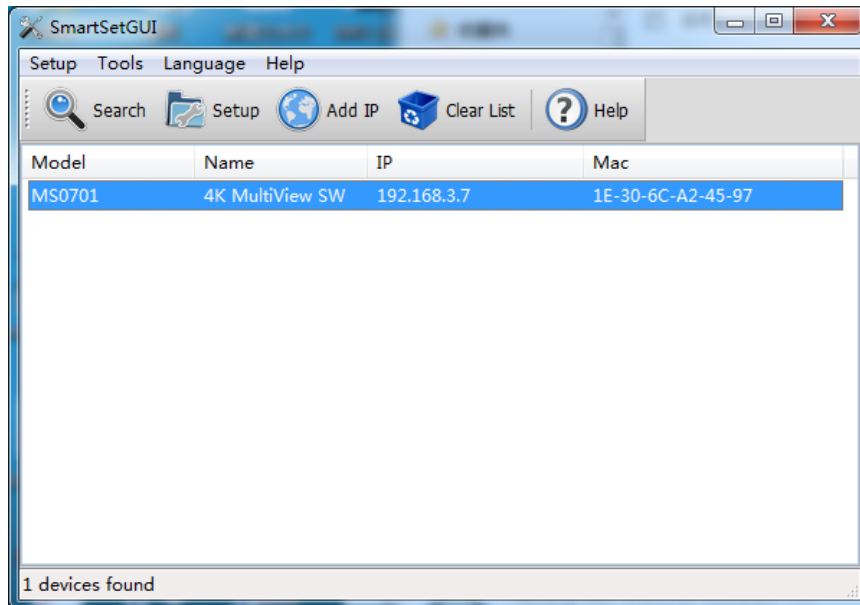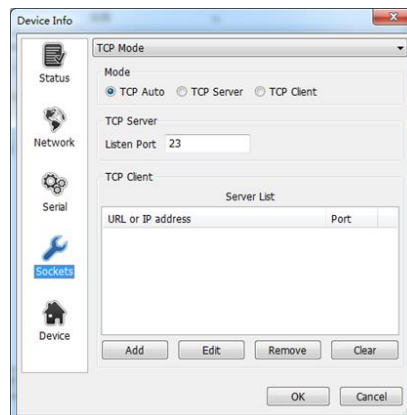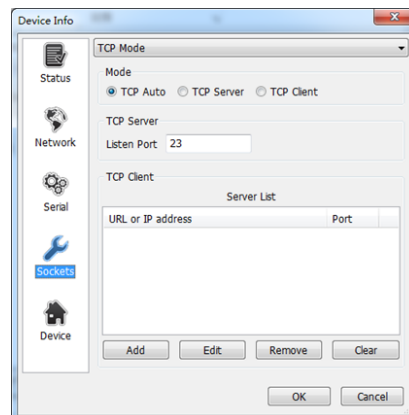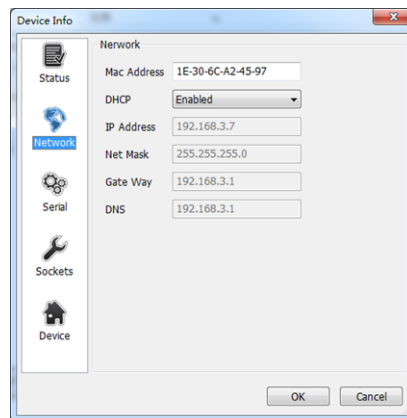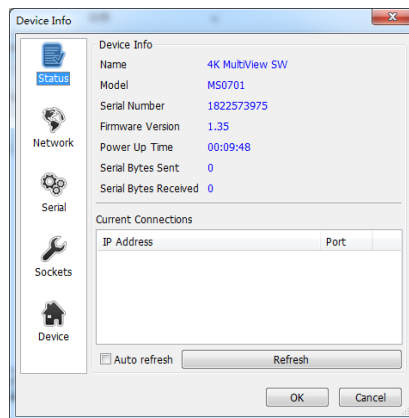**Parameter data**: xx (N byte) Carriage Return Termination is not required. All values are in ASCII.

### 3.3.1 Source Control

#### 3.3.1.1 Viewing Mode

| Function | Item | Command | Description |
|----------|------|---------|-------------|
| Screen Layout | Single Window | ATM 09 SCR_LYT W 1 | Switch to the single window. |
| | Dual Windows | ATM 09 SCR_LYT W 2 | Switch to the double windows. |
| | Triple Windows | ATM 09 SCR_LYT W 3 | Switch to the triple windows. |
| | Quadruple Windows | ATM 09 SCR_LYT W 4 | Switch to the quadruple windows. |

#### 3.3.1.2 Video Input Selection

| Function | Item | Command | Description |
|----------|------|---------|-------------|
| Video Input Selection | Viewer 1 | ATM 0A VDO_IPT W 1 **p** | **p = Input Number (1 ~ 7)**<br><br>Send Input **p** as view window video output |
| | Viewer 2 | ATM 0A VDO_IPT W 2 **p** | |
| | Viewer 3 | ATM 0A VDO_IPT W 3 **p** | |
| | Viewer 4 | ATM 0A VDO_IPT W 4 **p** | |

#### 3.3.1.3 Audio Input Selection

| Function | Item | Command | Description |
|----------|------|---------|-------------|
| Audio Input Selection | Select audio input | ATM 09 ADO_IPT W **p** | **p = Input Number (1 ~ 7)**<br><br>Set Input **p** as audio output |
| Audio Input Config. | Set input to use HDMI or external audio | ATM 0A AUD_MOD W **p q** | **p = Input Number (1 ~ 6)**<br>**q = Audio Mode (0 = HDMI Audio; 1 = External Audio)** |
| Query Audio Input Config. | Check whether input is using HDMI or external audio | ATM 09 AUD_MOD R **p** | **p = Input Number (1 ~ 6)**<br><br>0 = HDMI Audio; 1 = External Audio |

### 3.3.1.4 Volume Control

| Function | Item | Command | Description |
|---|---|---|---|
| Audio Volume Control | Adjust volume of audio output | ATM 09 VOL_CRL W **p** | **p = Volume (0 ~ 10)**<br>0 = No Audio |
| Audio Mute | Control audio mute | ATM 09 AUD_MUT W **p** | **p = Audio Mute Setting**<br>**0** = Mute; **F** = Cancel Mute |

### 3.3.1.5 Aspect Ratio Selection

| Function | Item | Command | Description |
|---|---|---|---|
| Set View Window Aspect Ratio | Viewer 1 | ATM 0A WIN_RAT W 1 **p** | **p = Aspect Ratio Setting**<br>1 = Original Aspect Ratio<br>2 = Picture Fills Entire Window<br>3 = 16:9 (Widescreen) Aspect Ratio<br>4 = 4:3 (Standard) Aspect Ratio |
| | Viewer 2 | ATM 0A WIN_RAT W 2 **p** | |
| | Viewer 3 | ATM 0A WIN_RAT W 3 **p** | |
| | Viewer 4 | ATM 0A WIN_RAT W 4 **p** | |

### 3.3.1.6 Resolution Selection

| Function | Item | Command | Description |
|---|---|---|---|
| HDMI Output Resolution | Select resolution for HDMI video output | ATM 09 OPT_TIM W **p** | **p = Video Resolution**<br>**1** = AUTO (based on display EDID)<br>**2** = 4K x 2K @ 30Hz (UHD)<br>**3** = 1920 x 1080 @ 60Hz (1080p)<br>**4** = 1280 x 720 @ 60Hz (720p)<br>**5** = 1920 x 1200 @ 60Hz (WUXGA)<br>**6** = 1600 x 1200 @ 60Hz (UXGA)<br>**7** = 1280 x 800 @ 60Hz (WXGA)<br>**8** = 1024 x 768 @ 60Hz (XGA) |

## 3.3.2 Advanced Control

### 3.3.2.1 Power Control

| Function | Item | Command | Description |
|---|---|---|---|
| Power Control | Power switcher on or off | ATM 09 POW_CRL W **p** | **p = Power Mode**<br>**0** = Power On<br>**F** = Power Off |
| Power Saving Mode Setting | Set idle time before switcher enter power saving mode | ATM 0A POW_SAV W **pp** | **pp = Time Before Enter Power Saving**<br>**00** = Disable Power Saving Mode<br>**05** = 5 Minutes<br>**0A** = 10 Minutes<br>**0F** = 15 Minutes<br>**1E** = 30 Minutes<br>**3C** = 60 Minutes |

### 3.3.2.2 Audio Delay

| Function | Item | Command | Description |
|---|---|---|---|
| Audio Delay | Off | ATM 09 AUD_DLY W **x** | **x = Audio Output Delay**<br>**0** = Off (No Delay)<br>**1** = 40 ms<br>**2** = 80 ms<br>**3** = 120 ms<br>**4** = 160 ms<br>**5** = 200 ms<br>**6** = 240 ms<br>**7** = 300 ms<br>**8** = 340 ms<br>**9** = 380 ms<br>**A** = 400 ms |

### 3.3.2.3 System Controls

| Function | Item | Command | Description |
|---|---|---|---|
| VGA Input Auto Position | Auto-adjust the VGA Input | ATM 08 VGA_AUT W | When VGA Input is selected, automatically adjust image position |
| OSD Control | Toggle Audio OSD | ATM 09 AUD_OSD W **x** | **x = Audio volume & mute OSD setting**<br>**0** = Audio OSD On<br>**1** = Audio OSD Off |
| | Toggle Video OSD | ATM 09 VDO_OSD W **x** | **x = Video source & IP address OSD setting**<br>**0** = Video OSD On<br>**1** = Video OSD Off |
| HDMI Output Audio Control | Mute/Un-mute the HDMI Output embedded audio | ATM 09 AUD_OPT W **x** | **x = HDMI embedded audio mute setting**<br>**0** = Mute<br>**1** = Un-mute |
| Restore Defaults | Factory Reset | CMD 0C RST_SET W | Restore unit to factory default settings |

| Function | Item | Command | Description |
|---|---|---|---|
| Baud Rate | Set Baud Rate | ATM 09 BAU_RAT W **x** | **x = window baud rate**<br>**1** = 9600<br>**2** = 14400<br>**3** = 19200<br>**4** = 38400<br>**5** = 56000<br>**6** = 57600<br>**7** = 115200 |
| HDCP & Output Timing | Toggle HDMI Output HDCP | ATM 0A HDO_HDP W 1 **x** | **x = HDCP "Switch-On" of HDMI Output port**<br>**0** = Enable<br>**F** = Disable |
| | Toggle HDBaseT Output HDCP | ATM 0A HDO_HDP W 2 **x** | **x = HDCP "Switch-On" of HDBaseT Output port**<br>**0** = Enable<br>**F** = Disable |
| | Check HDCP Status of HDMI Output | ATM 08 HDO_HDP R | Read/Check the HDCP switch status of the HDMI output port |
| | Check HDMI Output Timing | ATM 09 HDO_EDI W 1 | Read/Check the timing of the HDMI output port |
| | Check HDBaseT Output Timing | ATM 09 HDO_EDI W 2 | Read/Check the timing of the HDBaseT output port |
| Other | Query Software version | ATM 08 CSW_VER W | Read/Check the software version |
| | Enable HDMI Input HDCP | ATM 09 IPT_DCP W 1 | Enable HDCP "Switch-On" of HDMI Input ports |
| | Mute HDMI/DP Embedded Audio | ATM 09 AUD_OPT W 1 | Mute the HDMI/DisplayPort embedded audio |
| | System Update from USB | ATM 09 SYS_UPT W 1 | Upgrade system from connected USB flash drive containing upgrade file |

### 3.3.2 EDID Management

The MV71 has EDID management capabilities where either simple EDID presets can be recalled or EDID data can be captured or loaded into ROM and copied to each input. The simplest method is to use the built in preset EDIDs and assign them to an input.

**Preset EDID**

| |
|---|
| 1. 4K x 2K @30Hz 8Channel |
| 2. 4K x 2K @30Hz 2Channel |
| 3. 1080P 8Channel |
| 4. 1080P 2Channel |
| 5. VGA |
| 6. 4K x 2K @60Hz (For DP) |

ATM 0B EDI_POR W m C n

**INPUT**

| |
|---|
| HDMI 1 |
| HDMI 2 |
| HDMI 3 |
| HDMI 4 |
| DP 5 |
| DP 6 |
| VGA |

**User Define EDID**

| |
|---|
| 1. User Define EDID |
| 2. User Define EDID |
| 3. User Define EDID |
| 4. User Define EDID |
| 5. User Define EDID |
| 6. User Define EDID |
| 7. User Define EDID |

ATM 0B EDI_POR W m E n

**OUTPUT**

| |
|---|
| HDMI |

| |
|---|
| HDBT |

| |
|---|
| RAM Temp |

**UART/IP**

**Example:**
Assign a preset EDID to an input port
Send: ATM 0B EDI_POR W **M** C **N**
**M** = Input Port (1 ~ 7)
**N** = Preset EDID No. (1 ~ 6)
Feedback: EDI_POR

**Preset EDID**

| |
|---|
| 1. 4K x 2K @30Hz 8Channel |
| 2. 4K x 2K @30Hz 2Channel |
| 3. 1080P 8Channel |
| 4. 1080P 2Channel |
| 5. VGA |
| 6. 4K x 2K @60Hz (For DP) |

| Function | Command | Description |
|---|---|---|
| Copy Preset EDID to Input Port 1 | ATM 0B EDI_POR W 1 C **x** | **x = Preset EDID Number (1 ~ 4)**<br>**1** = EDID 1 (4Kx2K@30Hz, 8-channel)<br>**2** = EDID 2 (4Kx2K@30Hz, 2-channel)<br>**3** = EDID 3 (1080p, 8-channel)<br>**4** = EDID 4 (1080p, 2-channel) |
| Copy Preset EDID to Input Port 2 | ATM 0B EDI_POR W 2 C **x** | **x = Preset EDID Number (1 ~ 4)**<br>**1** = EDID 1 (4Kx2K@30Hz, 8-channel)<br>**2** = EDID 2 (4Kx2K@30Hz, 2-channel)<br>**3** = EDID 3 (1080p, 8-channel)<br>**4** = EDID 4 (1080p, 2-channel) |
| Copy Preset EDID to Input Port 3 | ATM 0B EDI_POR W 3 C **x** | **x = Preset EDID Number (1 ~ 4)**<br>**1** = EDID 1 (4Kx2K@30Hz, 8-channel)<br>**2** = EDID 2 (4Kx2K@30Hz, 2-channel)<br>**3** = EDID 3 (1080p, 8-channel)<br>**4** = EDID 4 (1080p, 2-channel) |
| Copy Preset EDID to Input Port 4 | ATM 0B EDI_POR W 4 C **x** | **x = Preset EDID Number (1 ~ 4)**<br>**1** = EDID 1 (4Kx2K@30Hz, 8-channel)<br>**2** = EDID 2 (4Kx2K@30Hz, 2-channel)<br>**3** = EDID 3 (1080p, 8-channel)<br>**4** = EDID 4 (1080p, 2-channel) |
| Copy Preset EDID to Input Port 5 | ATM 0B EDI_POR W 5 C **x** | **x = Preset EDID Number (1 ~ 4, 6)**<br>**1** = EDID 1 (4Kx2K@30Hz, 8-channel)<br>**2** = EDID 2 (4Kx2K@30Hz, 2-channel)<br>**3** = EDID 3 (1080p, 8-channel)<br>**4** = EDID 4 (1080p, 2-channel)<br>**5** = EDID 6 (4Kx2K@60Hz for DisplayPort) |
| Copy Preset EDID to Input Port 6 | ATM 0B EDI_POR W 6 C **x** | **x = Preset EDID Number (1 ~ 4, 6)**<br>**1** = EDID 1 (4Kx2K@30Hz, 8-channel)<br>**2** = EDID 2 (4Kx2K@30Hz, 2-channel)<br>**3** = EDID 3 (1080p, 8-channel)<br>**4** = EDID 4 (1080p, 2-channel)<br>**5** = EDID 6 (4Kx2K@60Hz for DisplayPort) |
| Copy Preset EDID to Input Port 7 | ATM 0B EDI_POR W 7 C **x** | **x = Preset EDID Number (4 ~ 5)**<br>**4** = EDID 4 (1080p, 2-channel)<br>**5** = EDID 5 (VGA) |

| Function | Command | Description |
|---|---|---|
| Copy EEPROM EDID to Input Port 1 | ATM 0B EDI_POR W 1 E **x** | **x = EEPROM EDID Source (1 ~ 7)**<br>**1** = EEPROM 1<br>**2** = EEPROM 2<br>**3** = EEPROM 3<br>**4** = EEPROM 4<br>**5** = EEPROM 5<br>**6** = EEPROM 6<br>**7** = EEPROM 7 |
| Copy EEPROM EDID to Input Port 2 | ATM 0B EDI_POR W 2 E **x** | **x = EEPROM EDID Source (1 ~ 7)**<br>**1** = EEPROM 1<br>**2** = EEPROM 2<br>**3** = EEPROM 3<br>**4** = EEPROM 4<br>**5** = EEPROM 5<br>**6** = EEPROM 6<br>**7** = EEPROM 7 |
| Copy EEPROM EDID to Input Port 3 | ATM 0B EDI_POR W 3 E **x** | **x = EEPROM EDID Source (1 ~ 7)**<br>**1** = EEPROM 1<br>**2** = EEPROM 2<br>**3** = EEPROM 3<br>**4** = EEPROM 4<br>**5** = EEPROM 5<br>**6** = EEPROM 6<br>**7** = EEPROM 7 |
| Copy EEPROM EDID to Input Port 4 | ATM 0B EDI_POR W 4 E **x** | **x = EEPROM EDID Source (1 ~ 7)**<br>**1** = EEPROM 1<br>**2** = EEPROM 2<br>**3** = EEPROM 3<br>**4** = EEPROM 4<br>**5** = EEPROM 5<br>**6** = EEPROM 6<br>**7** = EEPROM 7 |
| Copy EEPROM EDID to Input Port 5 | ATM 0B EDI_POR W 5 E **x** | **x = EEPROM EDID Source (1 ~ 7)**<br>**1** = EEPROM 1<br>**2** = EEPROM 2<br>**3** = EEPROM 3<br>**4** = EEPROM 4<br>**5** = EEPROM 5<br>**6** = EEPROM 6<br>**7** = EEPROM 7 |

| Function | Command | Description |
|---|---|---|
| Copy EEPROM EDID to Input Port 6 | ATM 0B EDI_POR W 6 E **x** | **x = EEPROM EDID Source (1 ~ 7)**<br>**1** = EEPROM 1<br>**2** = EEPROM 2<br>**3** = EEPROM 3<br>**4** = EEPROM 4<br>**5** = EEPROM 5<br>**6** = EEPROM 6<br>**7** = EEPROM 7 |
| Copy EEPROM EDID to Input Port 7 | ATM 0B EDI_POR W 7 E **x** | **x = EEPROM EDID Source (1 ~ 7)**<br>**1** = EEPROM 1<br>**2** = EEPROM 2<br>**3** = EEPROM 3<br>**4** = EEPROM 4<br>**5** = EEPROM 5<br>**6** = EEPROM 6<br>**7** = EEPROM 7 |
| Write EDID Name (EEPROM) | ATM 13 EDI_NAE W **x** 4K2K_8CH_**x** | **x = Internal EDID No. (1 ~ 7)**<br>**1** = EDID 1<br>**2** = EDID 2<br>**3** = EDID 3<br>**4** = EDID 4<br>**5** = EDID 5<br>**6** = EDID 6<br>**7** = EDID 7 |
| Read EDID Name (EEPROM) | ATM 09 EDI_NAE R **x** | **x = Internal EDID No. (1 ~ 7)**<br>**1** = EDID 1<br>**2** = EDID 2<br>**3** = EDID 3<br>**4** = EDID 4<br>**5** = EDID 5<br>**6** = EDID 6<br>**7** = EDID 7 |
| Write RAM EDID Data to EEPROM | ATM 09 EDI_EEP W **x** | **x = EEPROM Destination No. (1~7)**<br>**1** = EEPROM 1<br>**2** = EEPROM 2<br>**3** = EEPROM 3<br>**4** = EEPROM 4<br>**5** = EEPROM 5<br>**6** = EEPROM 6<br>**7** = EEPROM 7 |

| Function | Command | Description |
|---|---|---|
| Read EDID Data from EEPROM | ATM 09 EDI_EEP R **x** | **x = EEPROM Source No. (1~7)**<br>**1** = EEPROM 1<br>**2** = EEPROM 2<br>**3** = EEPROM 3<br>**4** = EEPROM 4<br>**5** = EEPROM 5<br>**6** = EEPROM 6<br>**7** = EEPROM 7 |
| Read EDID Data from Output Port | ATM 09 EDI_POR R **x** | **x = Input Port to Read (1 ~ 7)**<br>**1** = Input port 1 (HDMI 1)<br>**2** = Input port 2 (HDMI 2)<br>**3** = Input port 3 (HDMI 3)<br>**4** = Input port 4 (HDMI 4)<br>**5** = Input port 5 (DisplayPort 1)<br>**6** = Input port 6 (DisplayPort 2)<br>**7** = Input port 7 (VGA) |
| Copy EDID of Output Port 1 to Input Port **x** | ATM 09 EDI_CPY 1 **x** | **x = Input Port (1 ~ 7)**<br>**1** = Input port 1 (HDMI 1)<br>**2** = Input port 2 (HDMI 2)<br>**3** = Input port 3 (HDMI 3)<br>**4** = Input port 4 (HDMI 4)<br>**5** = Input port 5 (DisplayPort 1)<br>**6** = Input port 6 (DisplayPort 2)<br>**7** = Input port 7 (VGA) |

## 3.4 Web Settings

The MV71 can be controlled via a web browser, which contains the home screen, general settings, and advanced settings. After the cables are connected, the IP address is obtained and the IP address is input in the Web browser, allowing the MV71 to be controlled. For more information about how to obtain the IP address, see **3.2 IP Settings**.

For example, the obtained IP address is 192.168.3.5 and port number is 23.
Input "http://10.0.0.10" in the address bar of the web browser.

### 3.4.1 General Settings

- Screen Layout Selection
- Video Input Selection
- Aspect Ratio
- Audio Input Selection
- Audio Volume Setting
- Output Timing Setting
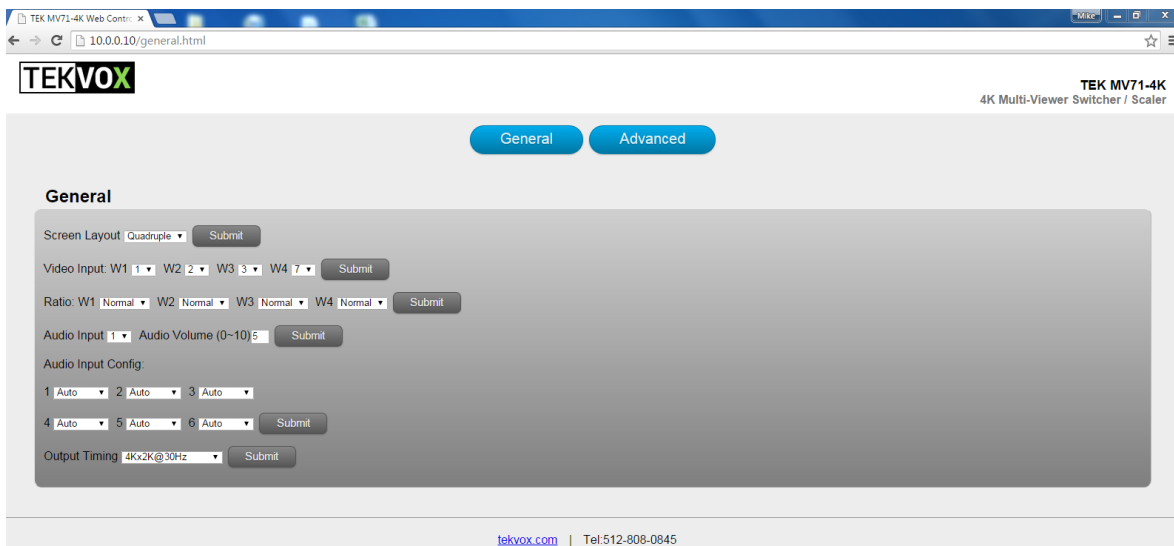


### 3.4.1.1 Screen Layout Selection
**Screen Layout**: Single, Double, Triple, Quadruple (Default: Single)



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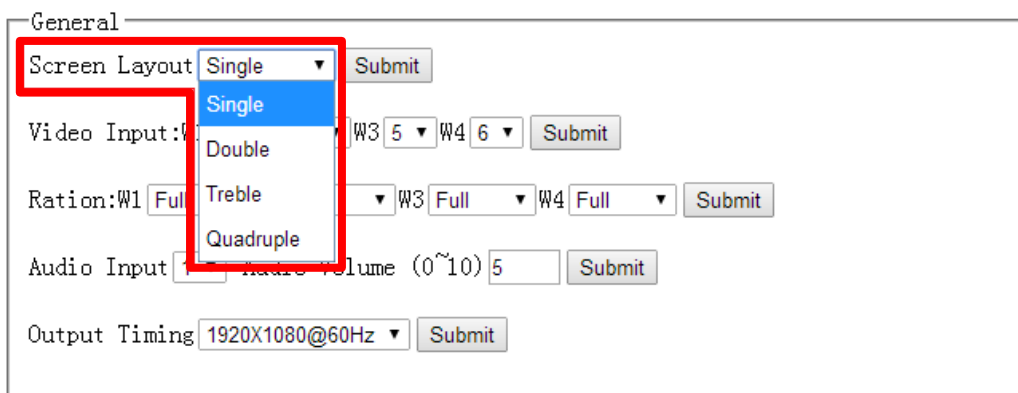
Press "Submit" to save changes.

### 3.4.1.2 Video Input Selection



For each of the viewing windows (W1 ~ 4), choose which of the seven (1 ~ 7) video inputs to display
**Note:** Only W1 will display while in the Single screen layout, only W1 & W@ in the Double screen layout, and only W1, W2, and W3 in the Triple screen layout.

Press "Submit" to save changes.

### 3.4.1.3 Aspect Ratio



For each of the viewing windows (W1 ~ 4), choose which aspect ratio to display the video sources

**Normal:** Set the picture in the window to its original aspect ratio
**Full:** Set the picture in the window to fill the entire window
**16:9:** Set the picture to a 16:9 (widescreen) aspect ratio
**4:3:** Set the picture to a 4:3 (standard) aspect ratio

Press "Submit" to save changes.

### 3.4.1.4 Audio Input



Select which video source (1 ~ 7) to use as the audio source.

Press "Submit" to save changes.

### 3.4.1.5 Audio Volume



Set the volume to an integer value from 0 (Mute) ~ 10 (Max Volume).

Press "Submit" to save changes

### 3.4.1.6 Output Timing



HDMI Output Resolution: AUTO (based on display EDID), 4Kx2K@30Hz, 1920x1080@60Hz (1080p), 1280x720@60Hz (720p), 1920x1200@60Hz, 1600x1200@60Hz, 1280x800@60Hz, 1024x768@60Hz

Press "Submit" to save changes.

## 3.4.2 Advanced Settings
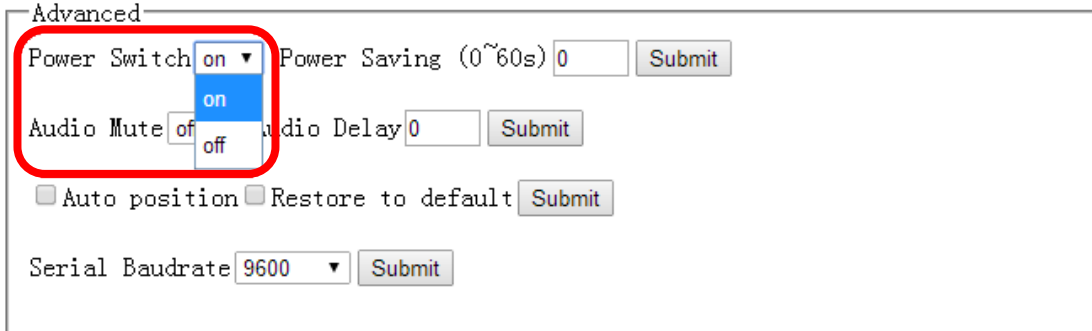


- Power Switch Toggle
- Power Saving Mode
- Audio Mute
- Audio Delay Setting
- Auto-Position Setting

- Restore to Factory Defaults
- Serial Baud Rate Setting

### 3.4.2.1 Power Switch Toggle
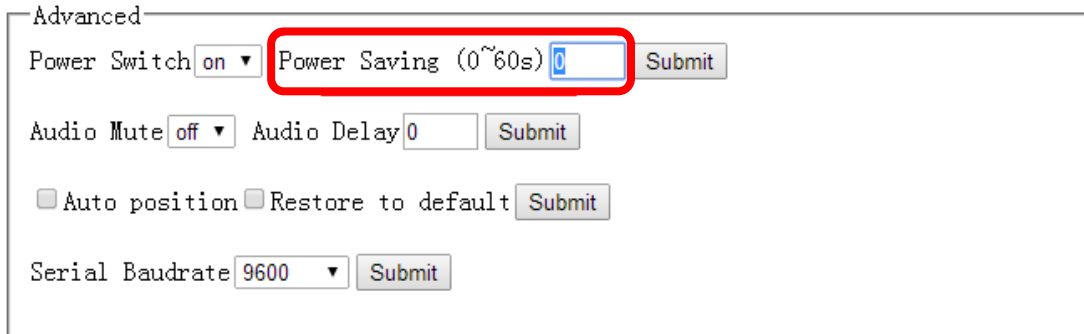


Turn the unit on or off. Press "Submit" to apply.

### 3.4.2.2 Power Saving Mode
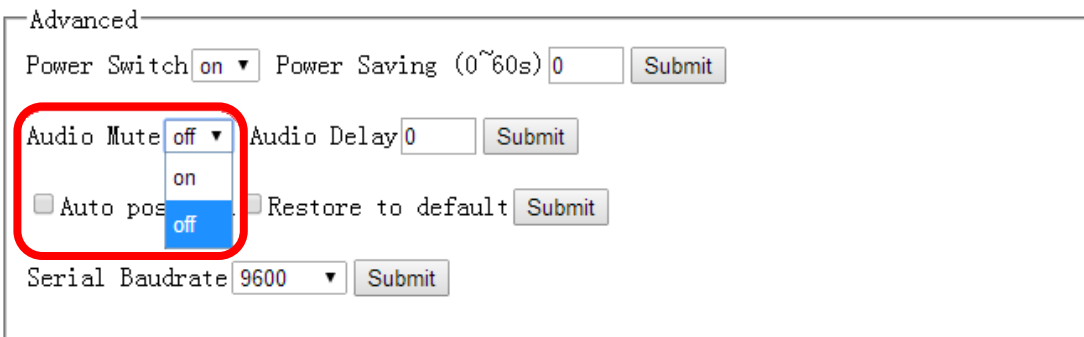


Choose how long the switcher waits after an input is no longer detected before entering power-saving mode. Time can be any integer value from 0 (Never enter power-saving mode) ~ 60 minutes. Recommended values include 5, 10, 15, 30, and 60 minutes.

Press "Submit" to save changes.

### 3.4.2.3 Audio Mute



Off (Disables the mute, playing audio normally) or On (Enables the mute, preventing audio from playing). If the Audio OSD is enabled, icons will show the current state of the audio mute.

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*3.4.2.4 Audio Delay Setting*



Choose a value for the audio delay from 0 (no delay) ~ 10 (400ms delay).

Press "Submit" to save changes.

*3.4.2.5 Auto Position Setting*



When this option is selected, the VGA input's position, clock, and phase will be adjusted automatically. If the Video OSD is enabled, this setting will be indicated by "Auto Adjust" text.

Press "Submit" to save changes.

*3.4.2.6 Restore to Default Settings*
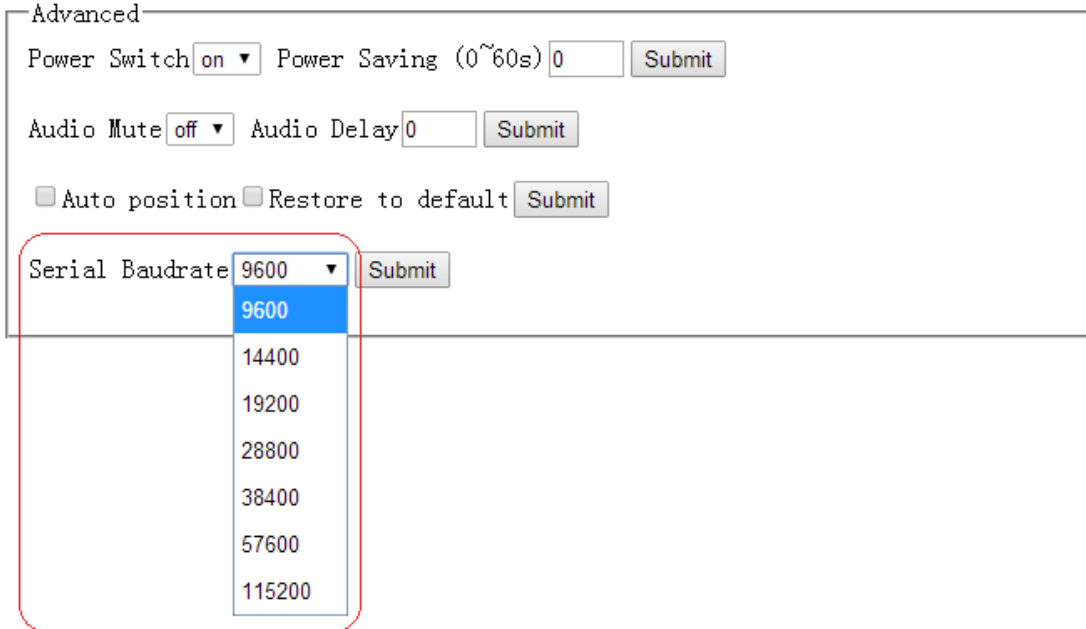


To restore all settings to their factory default values, select this option and press "Submit".

### 3.4.2.7 Serial Baud Rate Setting



Select the desired baud rate for serial communications. The recommended baud rate for this switcher is 9600.

Press "Submit" to save changes.

## 4. Firmware Update

The MV71 can be updated through a USB drive as follows:
1) Copy the updated file MERGE.bin to the root directory of the USB drive.
2) Connect the USB drive to the USB port on the rear of the device.
3) Connect the HDMI display to the MV71.
4) Turn on the MV71. The display device displays the HDMI output signal after normal boot of the device.
5) Press and hold the INPUTS 1 button for more than five seconds, "System upgrading..."is displayed in the display device, at the same time, all the button indicators on the front panel will blink.
6) After updating, the device reboots automatically.
7) Turn off or restart the device after the red indicators on the panel are off and the updating has completed.

## 5. Specifications

| | |
|---|---|
| **Inputs** | 4 HDMI (19-pin, Female)<br>2 DisplayPort (20-pin, Female)<br>1 VGA (15-pin, Female)<br>7 Stereo Audio, Unbalanced (3.5mm mini jack) |
| **Outputs** | 1 HDMI (19-pin, Female)<br>4 Stereo Audio, Unbalanced, 7.1 Surround Sound (3.5mm mini jack)<br>1 Optical Audio |
| **Supported Input Resolutions** | HDMI: Up to 4Kx2K@30Hz<br>DisplayPort: Up to 4Kx2K@60Hz |
| **Output Resolutions** | 4Kx2K, 1080p, 720p, WUXGA, UXGA, WXGA, XGA |
| **Control Ports** | 1 RS-232 (DB-9, Female)<br>1 TCP/IP, Telnet Port 23 (RJ45, Female)<br>1 USB 2.0 (Type-A, Female) |
| **Power Supply** | 100 ~ 240V AC |
| **Compliances** | CE, MTBF (30,000 hours), HDMI 1.4, DHCP 1.4, MHL, DisplayPort 2.0 |
| **Product Dimensions** | 1.7" (43.5mm) x 17.3" (440mm) x 10.7" (272mm) |
| **Product Weight** | 7.3 lbs. (3.3kg) |