VWP-0812

Video Wall Processor

User Manual

1. Introduction

This video wall processor is a high-end video processing equipment developed and manufactured by our company for LCD large screen display and so on. It has adopted the CrossInt smart splicing technology specially designed for splicing display and all display modules are locked by FST technology before synchronous output, eliminating the asynchronous display between contents of multiple modules.

2. Features

➢ Supports 8 DVI-I inputs Compatible with DVI/HDMI/VGA/CVBS);

➢ Supports 12 HDMI outputs;

➢ Up to 8 layouts/windows in total;

➢ Colorful LCD screen for the real-time information and menu setting;

➢ Supports sources real-time preview function(with 1000M LAN port);

➢ All 60Hz image processing, achieving smooth and non-tearing images;

➢ Support output port mapping, allowing blind wire connections;

➢ Support black/blue screen while wrong sources output;

➢ Support mode and source switching effects (CUT of FADE effects);

2. Hardware Introduction

2.1 Front Panel
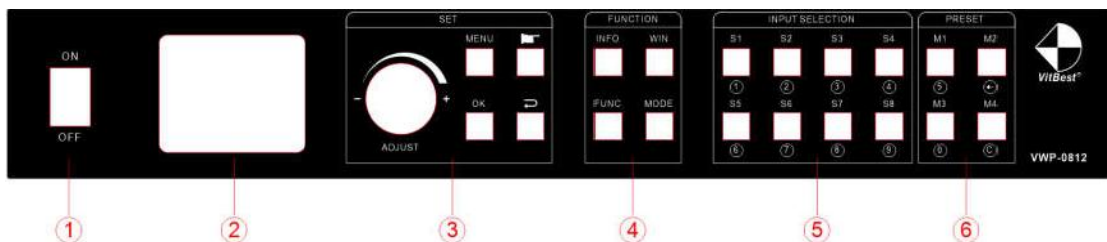
① **POWER:** Power switch ON/OFF

② **Colorful LCD screen:** for fast setting, information look up

③ **SET:** including ADJUST knob, OK, MENU, BACK and CONFIRM

④ **FUNCTION:** Function key area which includes INFO, WIN, FUNC, MODE

⑤ **INPUT SELECTION:** 8 signal sources fast switching buttons

⑥ **PRESET:** User-Mode recall buttons

2.2 Back panel

① **INPUT:** 8 DVI-I input ports (Compatible with DVI/HDMI/VGA/CVBS)

② **2OUTPUT:** 12*HDMI output ports

③ **CTRL:** Control port which contains LAN (100M), LAN (1000M), COM (serial port)

④ **POWER**: Power supply port, AC 110-220V 50/60Hz

3. Specification

Video Inputs		

Type	Qty	Description
DVI-U	8	Support up to 1920×1200@60Hz, downward compatibility. Support DVI/HDMI/VGA/CVBS with different connectors Compatible with HDMI1.3 and lower version, EDID version 1.3

Video Outputs		

Type	Qty	Description
HDMI	12	Resolutions: 1024×768@60Hz till 1920×1080@60Hz Support 60Hz/50Hz/30Hz output frame rates

Function Description	

Outputs	12 outputs support splicing mode of arbitrary form, such as: 3×4, 2×6 etc.
8 layouts/windows	Up to 8 windows or layouts in total Each layout can be freely zoomed and adjusted. Images can overlap each other.
1000M Preview	The signal image can be gained on computer at real time by control software which includes both input signal and output signal
Switching Effect	When switching signals or user-modes, users can set up different effects and time

Others			
PC Control	RS232/RJ45 Ethernet	Dimension	440x290x66mm
Weight	5.4kg	Input Power	100-220V 60/60Hz
Work Environment	Temp: 0-40℃; Humid: 0-95%	Warranty	2 years

4. Device Debugging

4.1 Device Connection

Device connection could be divided into three parts: power connection, signal connection and control connection (used for software debugging).

Power connection: device power supply. Connection method: connect power cord to power plug.

Signal connection: the method transferring signal from signal source to LED large screen, method: signal source (e.g.: computer)→Mosaic Processor →LCD.
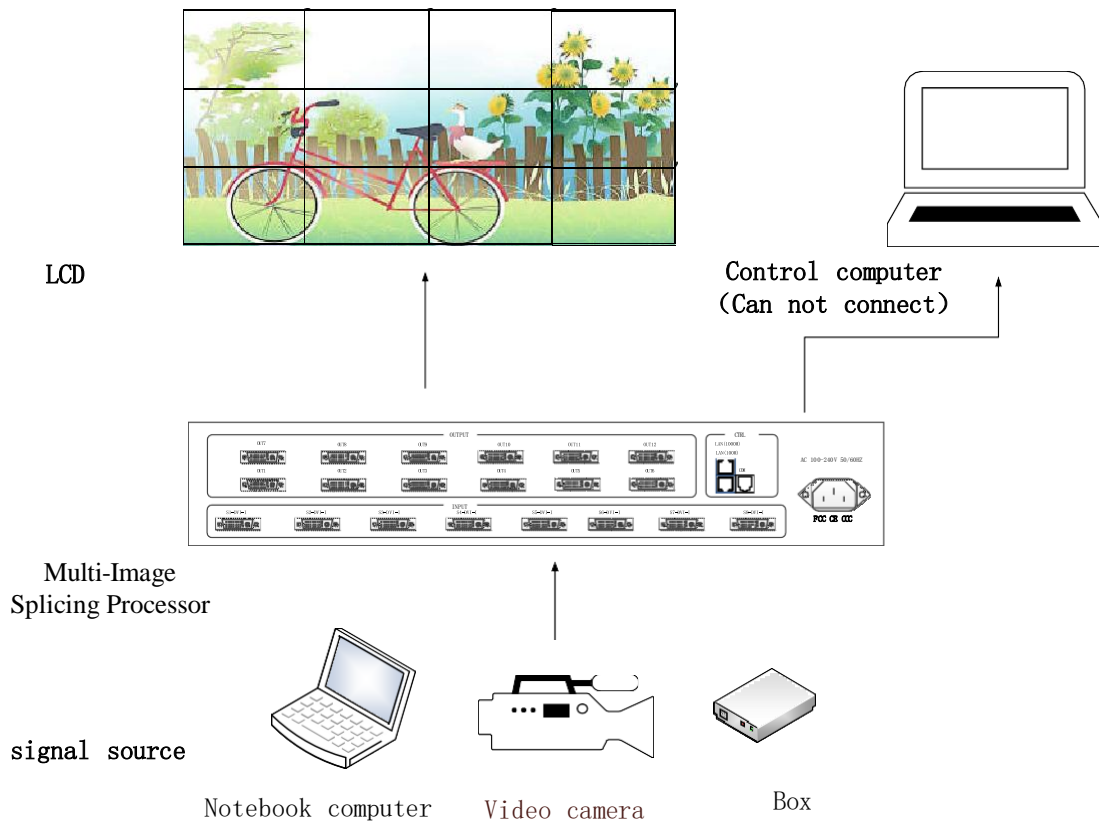
Control connection: connect control computer with device control port and debug device connection method. There are three connection methods

(1) Connect 100MB network control port with splicer LAN(100M) port, which can set device software

(2) Connect computer gigabit network port with splicer LAN(1000M) port, which can not only set device but also echo signal source image.

(3) Connect one crystal head of serial port line which is randomly donated by device with splicer COM port, and plug DB9 into computer serial port. Any kind of method among the three can realize device software control.

Connection diagram:

LCD

Control computer
(Can not connect)

Multi-Image
Splicing Processor

signal source

Notebook computer   Video camera   Box

4.2 Debugging Steps

Step 1: Press "MENU" to enter into main menu interface and click "Splicing Mode" to select splicing mode: 2×2、2×3、2×4、2×5、2×6、3×2、3×3、3×4、4×2、4×3、5×2、M×N.
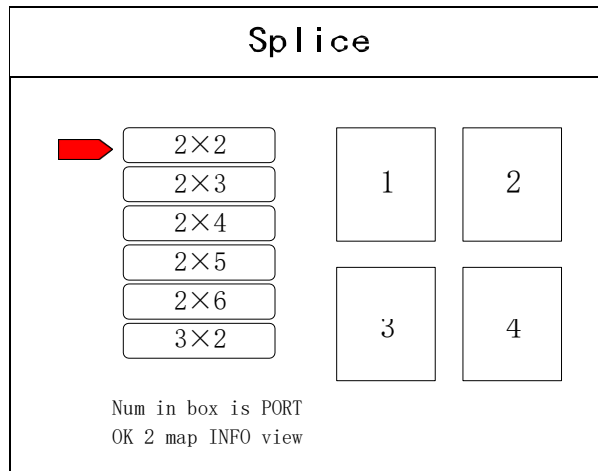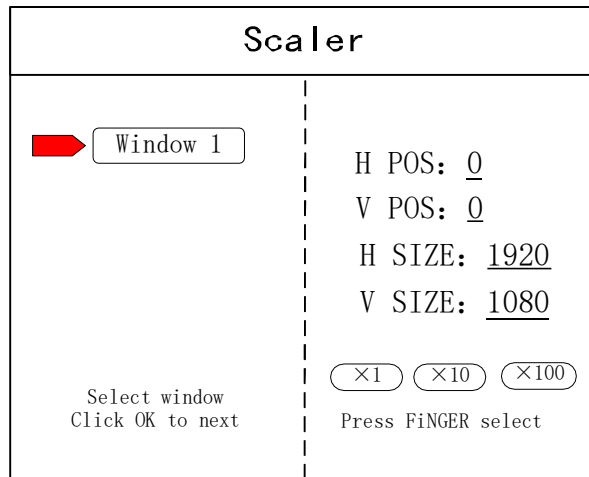

Note: Select M * N to customize the stitching method

Step 2: To get back to main menu interface to select "Image layout" and enter into image number selecting interface to select image number required to be set.
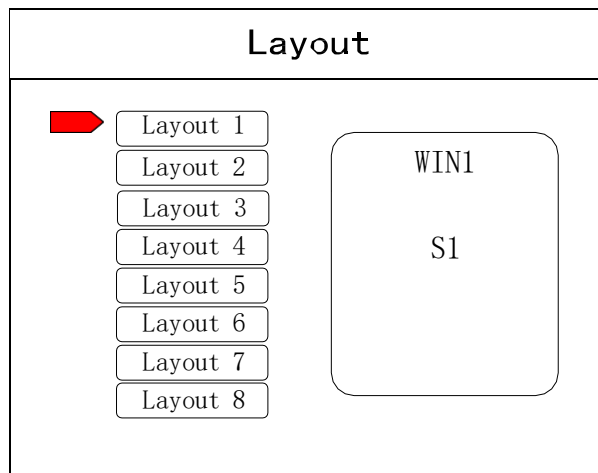
Note: This step can be skipped for signal image. For multi-image, it's OK if image number and item requirement are in consistent. Following operations can be taken to set when layout are not in consistent.

Step 3: Press "OK" and return to main menu interface; select "Image parameter" and enter into its setting interface to set size and position of each image.
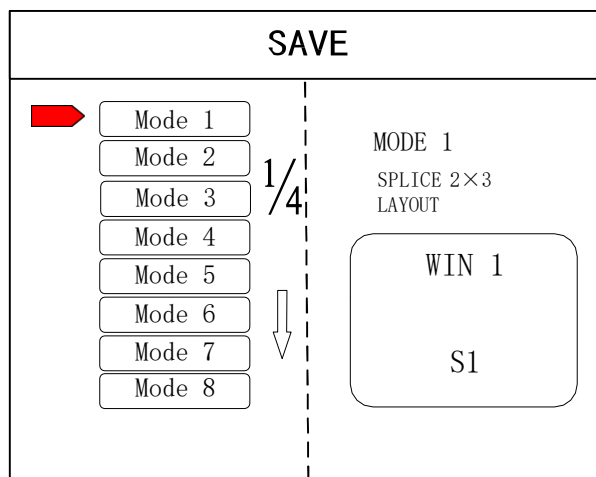
```
┌─────────────────────────────────────────┐
│              Scaler                       │
├──────────────────────┬────────────────────┤
│                      ┊                    │
│   ▶ [ Window 1 ]     ┊   H POS: 0         │
│                      ┊   V POS: 0         │
│                      ┊   H SIZE: 1920     │
│                      ┊   V SIZE: 1080     │
│                      ┊                    │
│                      ┊  (×1) (×10) (×100) │
│    Select window     ┊                    │
│    Click OK to next  ┊  Press FiNGER select│
│                      ┊                    │
└──────────────────────┴────────────────────┘
```

Note: there are two ways for number input:

(1) Adjust by rotate knob. Step length can be adjusted by "×1" "×10""×100", for instance, "×100"means that number of rotate knob increases by 100 each time.

(2) Input by number of the front panel. For example, ① of the [S1 ①] key refers to figure 1.

Step 4: Press "MENU" and return to main menu interface; select "Save setting" to enter into Data storage interface; select any mode and click "OK" to save data.

```
┌─────────────────────────────────────────┐
│                SAVE                       │
├──────────────────────┬────────────────────┤
│  ▶ [ Mode 1 ]        ┊                    │
│    [ Mode 2 ]        ┊   MODE 1           │
│    [ Mode 3 ]   1/4  ┊   SPLICE 2×3       │
│    [ Mode 4 ]        ┊   LAYOUT           │
│    [ Mode 5 ]        ┊  ┌──────────┐      │
│    [ Mode 6 ]        ┊  │  WIN 1   │      │
│    [ Mode 7 ]   ⇩    ┊  │          │      │
│    [ Mode 8 ]        ┊  │   S1     │      │
│                      ┊  └──────────┘      │
└──────────────────────┴────────────────────┘
```

Note: Mode 1 is default startup data of device boot; it's suggested that the most common mode or that required by device boot should be saved to Mode 1.

At this point, basic device debugging is completed. If there is other requirement, repeat the operation and save it as other mode.

After device debugging, just recall saved data according to different condition requirements in later stage.
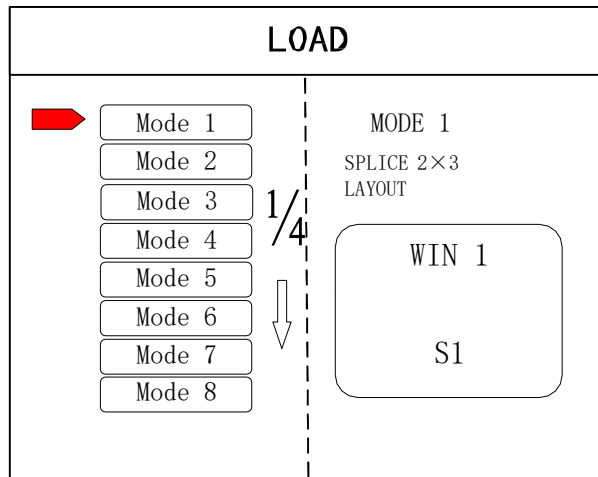
Data recall is divided into forms:

(1) For Shortcut key call, only select and press the "M1-M4" buttons on the front panel which is convenient when mode scenario is few.

[M1] [M2] [M3] [M4]

(2) For users to recall from the Main Menu, press "MENU" and select "User Mode" to enter

into its extraction interface. Then select needed mode and click "OK".
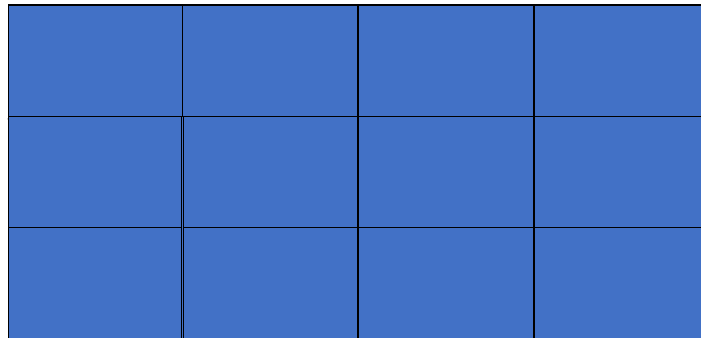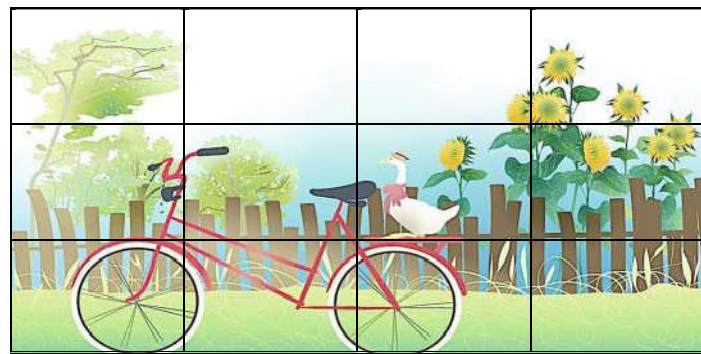

4.3 Case Study

Device debugging steps are explained by following cases.

Case: There are 12 LCD screens arranged in 3 rows and 4 columns, as shown in the following figure:

Requirement: all LCD screens are spliced together as a whole one :
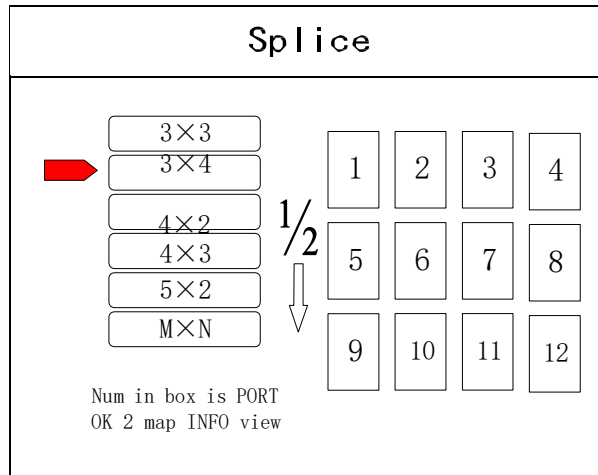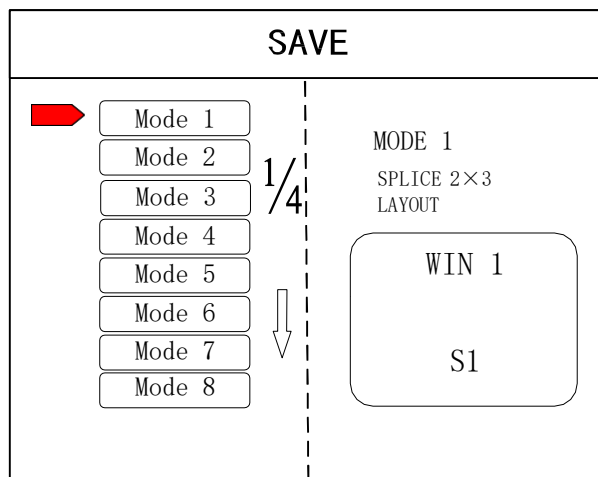

Arrangement of LCD screen

Display chart

Debugging Steps:

Step 1: Press "MENU" and enter into main menu interface to select "Cross Mosaic" of the first item "Device mode".

```
                    ┌─────────────────────────────────┐
                    │          Splice                 │
                    │ ┌───────────────────────────────┤
                    │ │  ┌─────────┐                   │
                    │ │  │  3×3    │  ┌──┐┌──┐┌──┐┌──┐  │
                    │ ┌─│  3×4    │  │1 ││2 ││3 ││4 │  │
                    │ ▶│  └─────────┘  └──┘└──┘└──┘└──┘  │
                    │   │  ┌─────────┐ 1/                │
                    │   │  │  4×2    │  /2 ┌──┐┌──┐┌──┐┌──┐│
                    │   │  │  4×3    │   │5 ││6 ││7 ││8 ││
                    │   │  └─────────┘    └──┘└──┘└──┘└──┘│
                    │   │  ┌─────────┐  ⇩                │
                    │   │  │  5×2    │  ┌──┐┌──┐┌──┐┌──┐ │
                    │   │  │  M×N    │  │9 ││10││11││12││
                    │   │  └─────────┘  └──┘└──┘└──┘└──┘ │
                    │   │ Num in box is PORT             │
                    │   │ OK 2 map INFO view             │
                    └───┴─────────────────────────────────┘
```

Step 2: Press "OK" to return to main menu interface; The large screen splicing is finished, select signal source needed to display on screen and click corresponding key(s1-s8).

Step 3: After normal display of large screen, save all setting data. Press"Save setting" to enter into "Save setting" interface to select "Mode 1" and click "OK". Things will be fine when it suggests saving successfully.

```
     ┌───────────────────────────────────────────┐
     │                 SAVE                       │
     ├───────────────────────────────────────────┤
     │  ┌──────────┐ ¦                            │
     ▶  │  Mode 1  │ ¦    MODE 1                  │
     │  ├──────────┤ ¦                            │
     │  │  Mode 2  │ 1/  SPLICE 2×3              │
     │  ├──────────┤ /4  LAYOUT                  │
     │  │  Mode 3  │ ¦                            │
     │  ├──────────┤ ¦  ┌─────────────────────┐  │
     │  │  Mode 4  │ ¦  │      WIN 1           │  │
     │  ├──────────┤ ¦  │                     │  │
     │  │  Mode 5  │ ¦  │                     │  │
     │  ├──────────┤ ¦  │       S1            │  │
     │  │  Mode 6  │ ¦  │                     │  │
     │  ├──────────┤ ⇩  └─────────────────────┘  │
     │  │  Mode 7  │ ¦                            │
     │  ├──────────┤ ¦                            │
     │  │  Mode 8  │ ¦                            │
     │  └──────────┘ ¦                            │
     └───────────────────────────────────────────┘
```

Note: Mode 1 is default startup data of device boot; it's suggested that the most common mode should be saved to Mode 1 and the device can save 32 kinds of modes at most.
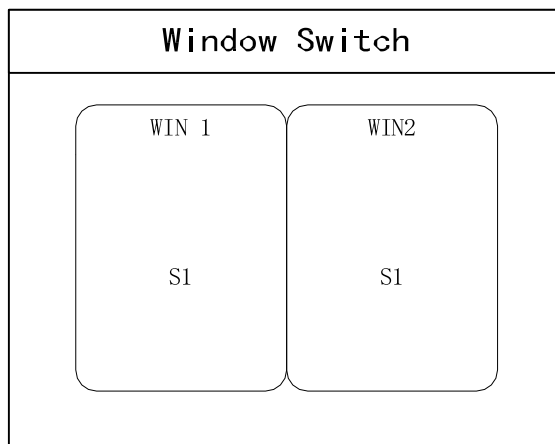
4.4 Function key:
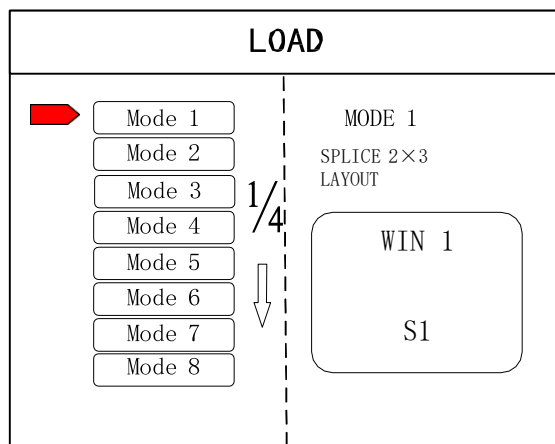
Brief explanation of function key:

INFO: Information query key. Click this key and enter into its interface showing whether all signal sources are inputting normally. Its interface is shown as below. Red light means signal is lost while green one shows signal is normal.

```
┌──────────────────────────────────────┐
│           MSG-Input Signal            │
├──────────────────────────────────────┤
│   ┌───────────┐    ┌───────────┐      │
│   │  S1 ●     │    │  S2 ●     │      │
│   │           │    │           │      │
│   │  [====]   │    │  [====]   │      │
│   └───────────┘    └───────────┘      │
│   ┌───────────┐    ┌───────────┐      │
│   │  S3 ●     │    │  S4 ●     │      │
│   │           │    │           │      │
│   │  [====]   │    │  [====]   │      │
│   └───────────┘    └───────────┘      │
└──────────────────────────────────────┘
```
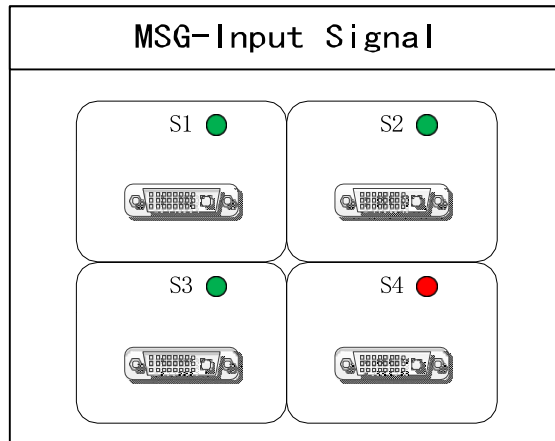
WIN: Image key. Click this key to enter into its interface and signal source selection can be made in following interface.

```
┌──────────────────────────────────────┐
│             Window Switch             │
├──────────────────────────────────────┤
│   ┌───────────┐    ┌───────────┐      │
│   │  WIN 1    │    │  WIN2     │      │
│   │           │    │           │      │
│   │           │    │           │      │
│   │    S1     │    │    S1     │      │
│   │           │    │           │      │
│   │           │    │           │      │
│   └───────────┘    └───────────┘      │
└──────────────────────────────────────┘
```

MODE: Mode recall key…Press this button to enter the user mode interface, and users can recall the saved modes

```
┌──────────────────────────────────────┐
│                 LOAD                  │
├──────────────────────────────────────┤
│  ➡ ┌─────────┐  │    MODE 1           │
│    │ Mode 1  │  │                     │
│    ├─────────┤  │  SPLICE 2×3         │
│    │ Mode 2  │  │  LAYOUT             │
│    ├─────────┤  │                     │
│    │ Mode 3  │ 1/4  ┌───────────┐     │
│    ├─────────┤  │   │  WIN 1    │     │
│    │ Mode 4  │  │   │           │     │
│    ├─────────┤  ⇓   │           │     │
│    │ Mode 5  │  │   │    S1     │     │
│    ├─────────┤  │   │           │     │
│    │ Mode 6  │  │   └───────────┘     │
│    ├─────────┤  │                     │
│    │ Mode 7  │  │                     │
│    ├─────────┤  │                     │
│    │ Mode 8  │  │                     │
│    └─────────┘  │                     │
└──────────────────────────────────────┘
```

FUNC: Function key. Press this key to enter into its interface which includes: brightness adjustment, special effect switch, VGA adjustment, image matting setting, edge feather, transparency setting, intelligent warm backup, preview monitor, IP setting, serial port, freeze frame, local and global, color space, input brightness and switch time. The following are explanations of those common functions.

1. Brightness adjustment

The device supports 1-255 stairs brightness adjustment. Brightness of all screen body can be adjusted synchronously to meet customers' different brightness adjustment requirements for different conditions.

2. Output condition

Use this button to set black screen or blue screen, and then you can switch the output state.

3. Special effect switch

The device supports directly switching the fade-in and fade-out effect, and ensures that the switching process is without flower screen, flash screen or black screen.

4. Special effect time

Set image switch times or switch time among different modes with the range of 0.2s-3s.

5. VGA adjustment

Since VGA signal belongs to analogue one, it tends to causes deviations among common functions. The product has two kinds of VGA corrections which are automatic correction and manual correction.

6. IP setting

Set device IP address for software debugging.

7. Clipped view

Specifies that the full screen of the signal source is placed on the screen in a particular area. You can set the specified location and size of the signal source. The value "0" represents no clipped view.
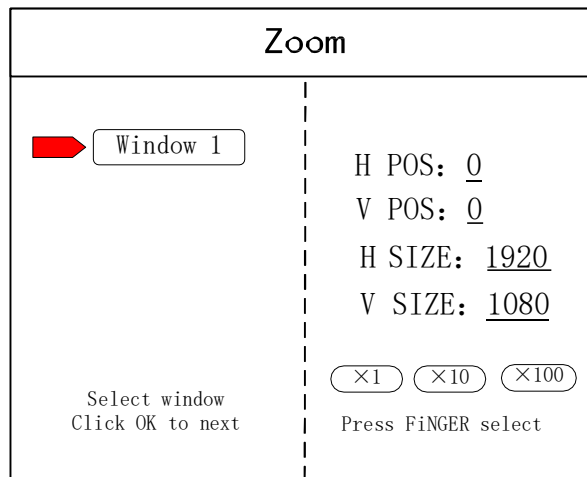
8. Local and global

Switch local display or global display of certain image on the condition that data of local display is already set.

9. Freeze frame

Set stillness or movement of certain image which is often used for field change or background switch.

10. Freeze full screen view

Set all images immobile or mobile.

11. Serial port setting

Set device serial port like baud rate and etc.

12. Output mapping

Set splicing mode and output port mapping.

4.5 Advanced Menu

Language setting

Set device language: English or Chinese

Output resolution

Support single output resolution, user-defined resolution is available and support 30HZ, 50HZ and 60HZ frame rate. Device default output resolution is 1920×1080@60HZ.

Factory setting

All data are cleared and the device returns to default state.

Common functions

Click "FUNC" to get quick access to common setting function.

Keyboard lock

Lock front panel key to avoid misoperation of irrelevant personnel.

Technical Support

Inquire device version number and its IP address.

5. Software Control

Step 1: Please click and download the control software at Google drive by clicking:

https://drive.google.com/open?id=1B9ReI8ZJrcfrtnLLAkti3LUnAaEmiDN5

Step 2: Extract the rar. File and install the control software on the control PC

Step 3: After install, double click to run the software.
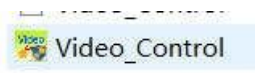
The default User name is: administrator, no password, click "ok" to login and it will show below interface:
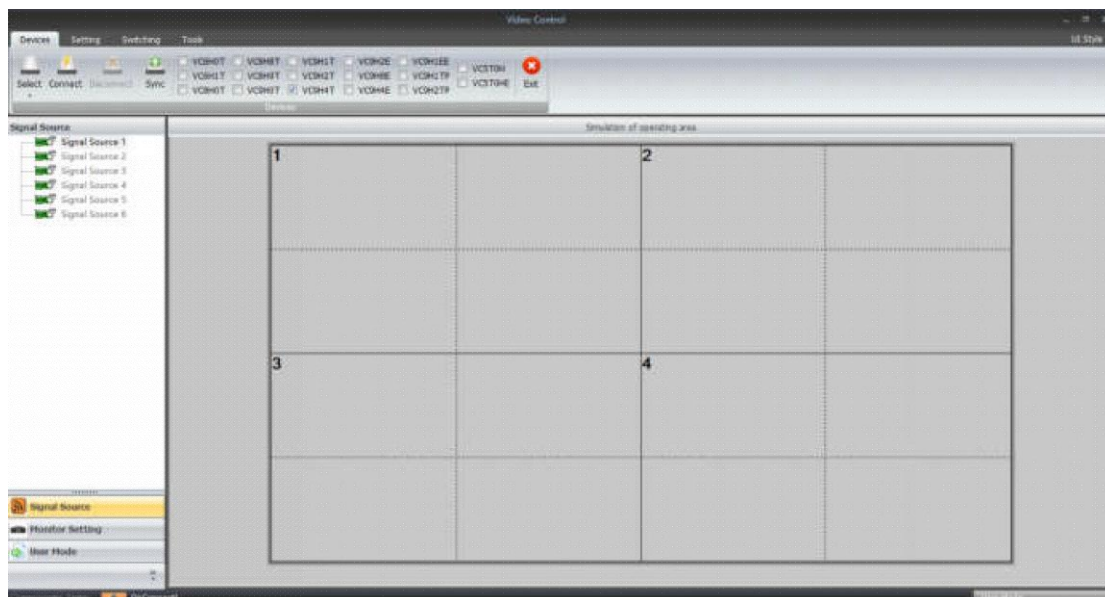
Before getting started, please make sure the control PC and controller is connected either by LAN or RS232 cable: If using the LAN control, the default IP address of the controller is 192.168.0.100, please also make sure the control PC and controller is at the same gateway. For using the RS232, please check and confirm which COM port is available on the PC.

Below will be showing on using the IP control.

3 steps to get connected: Click "Connect", Type the IP address 192.168.0.100, then click "OK"
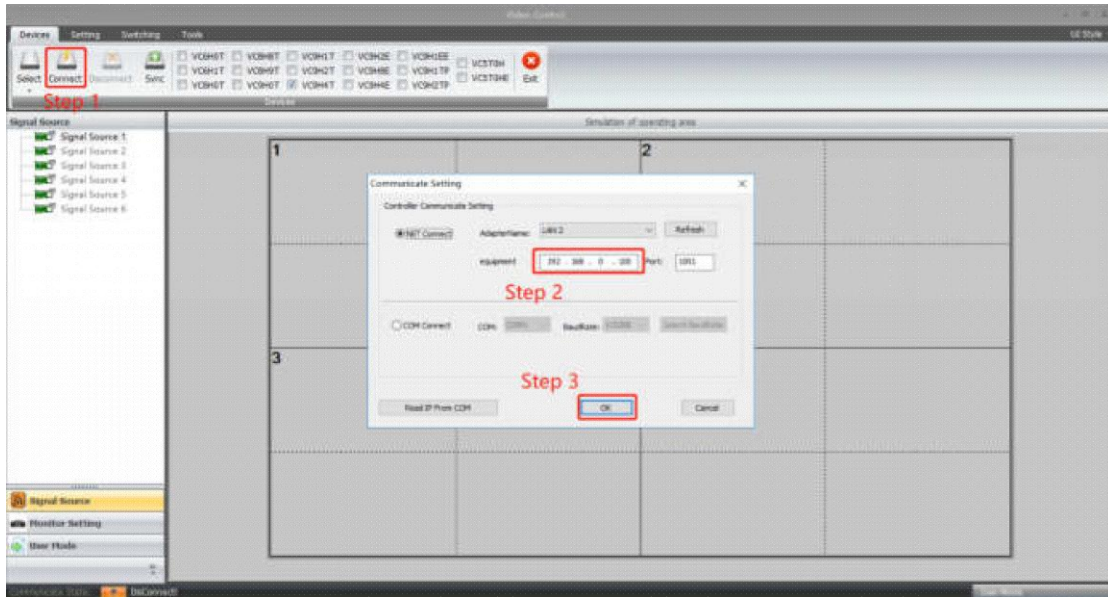
After well connected, it will pop-up a window for synchronination with the control software, click to "OK" to sync.
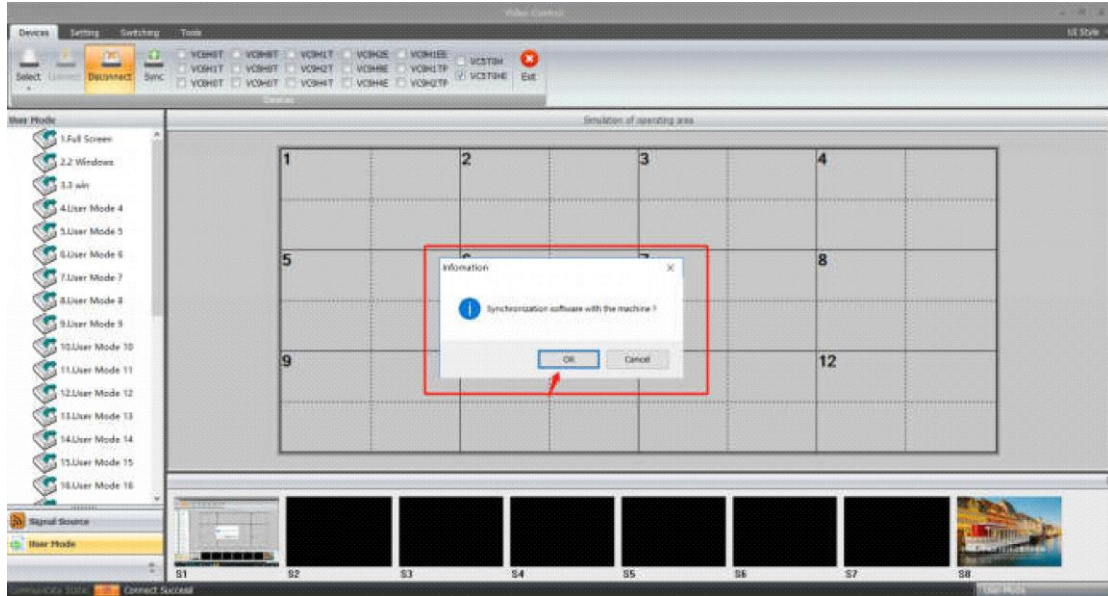
After click "OK" to sync, it will jump to "Switching" interface:
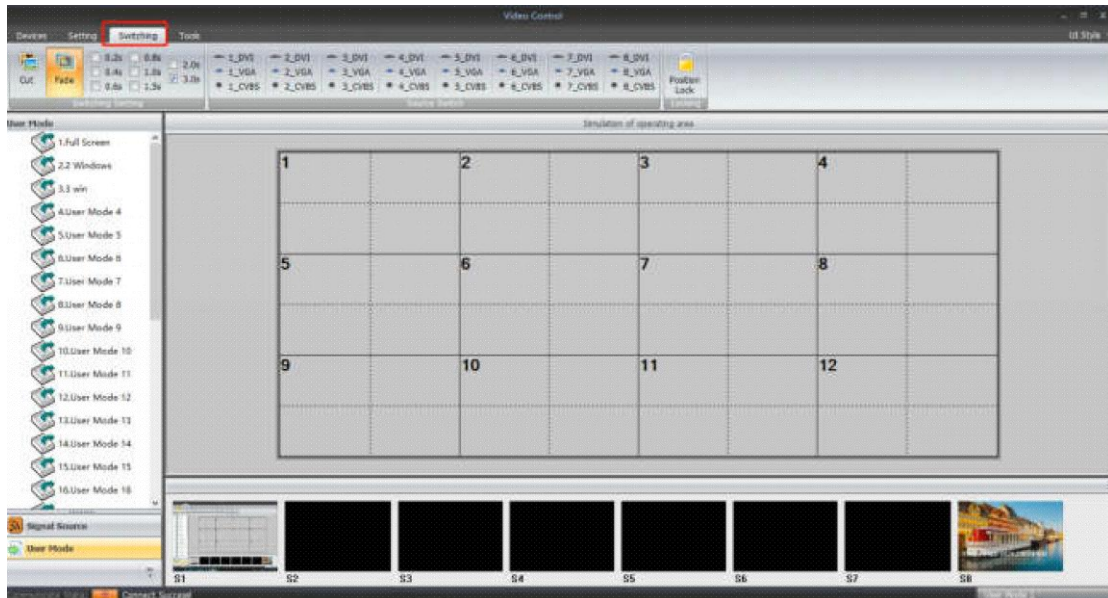
"Switching" interface, there are several sections:
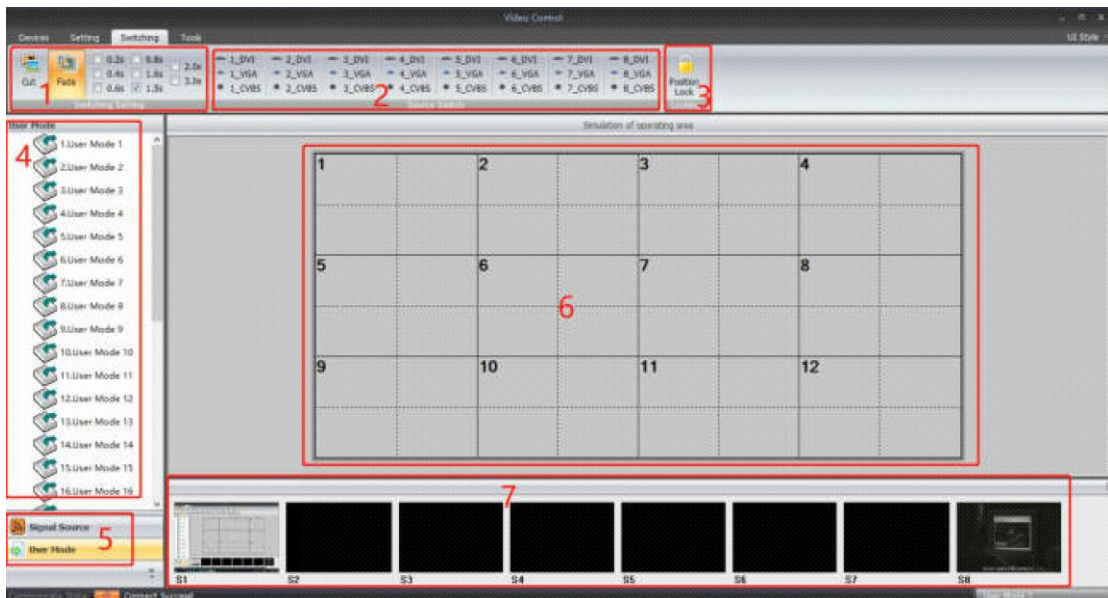
1: For the switching effects and time setting: Fade or Cut

2: 8 Signals type DVI/VGa/CVBS

3: Window position lock button

4: Display the details of the User Modes or the Signal sources

5: Collapse for the User Mode or the Signal Source

6: Video Wall Operation area

7: For the local sources preview(only with 1000M LAN port can support)

"Device" Interface:

After click "Device", it will be showing as below: For this model, we only use the "Connect/ disconnect" and "Exit" two buttons, the rest are for other equipment.
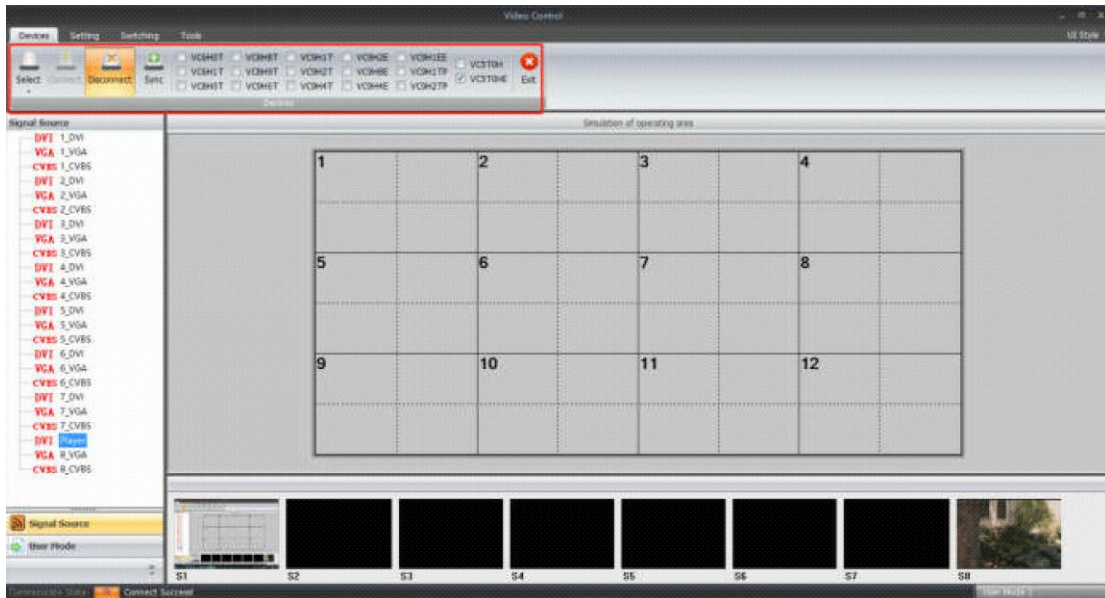
"Setting" Interface:

Users can set the video wall configuration accordingly. Open new window, save or recall users mode, and default back to factory mode and so on function here.
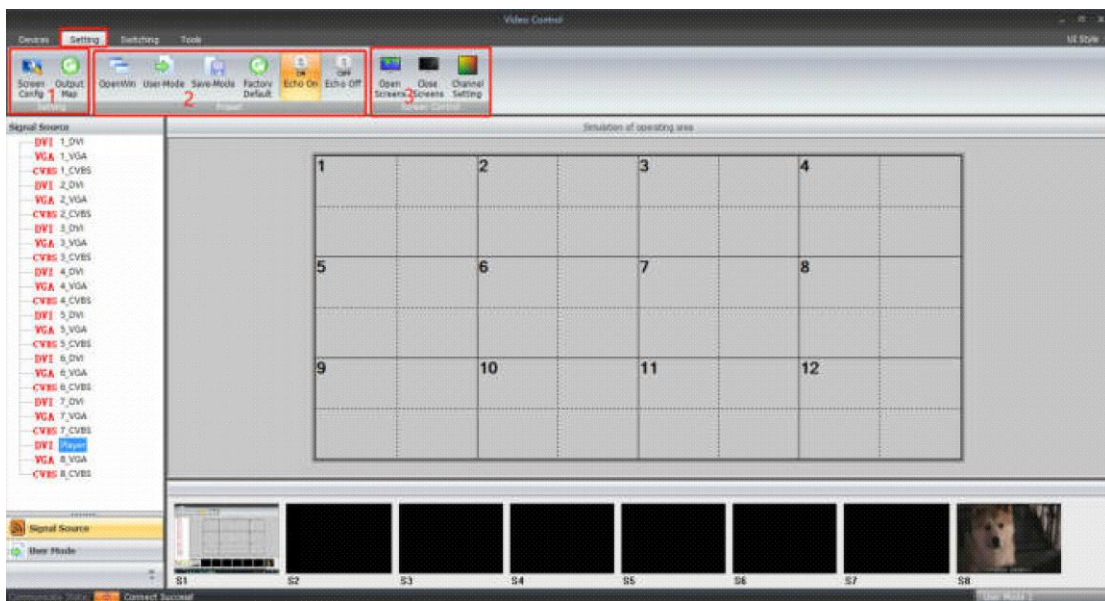
Screen config and Output Map:

Screen config(for the Video wall number and resolution settings):
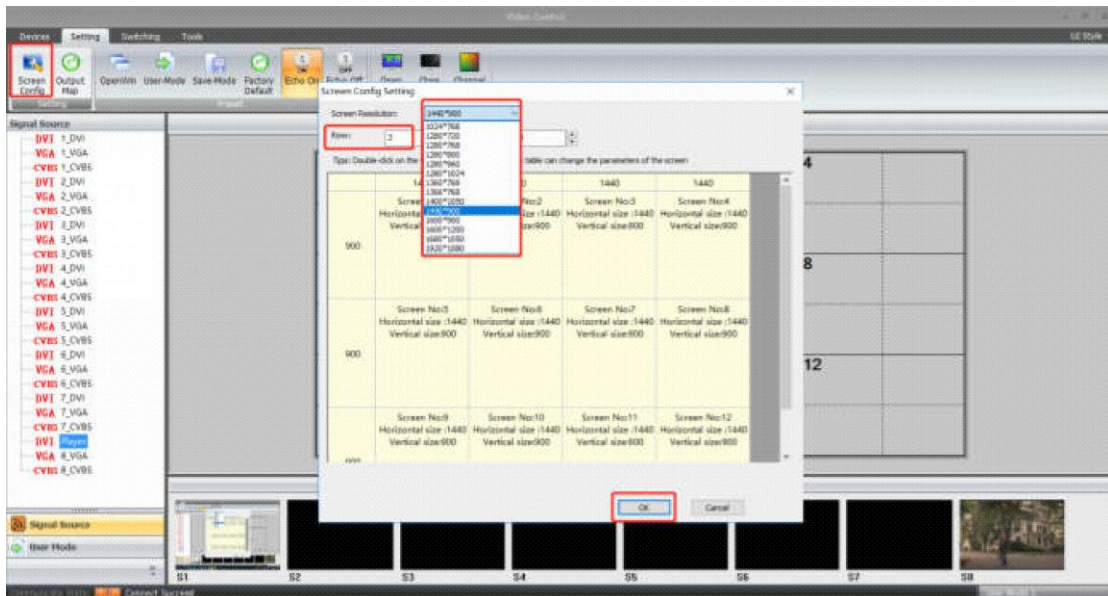
Output Map(for adjusting the output ports to match with the displays):
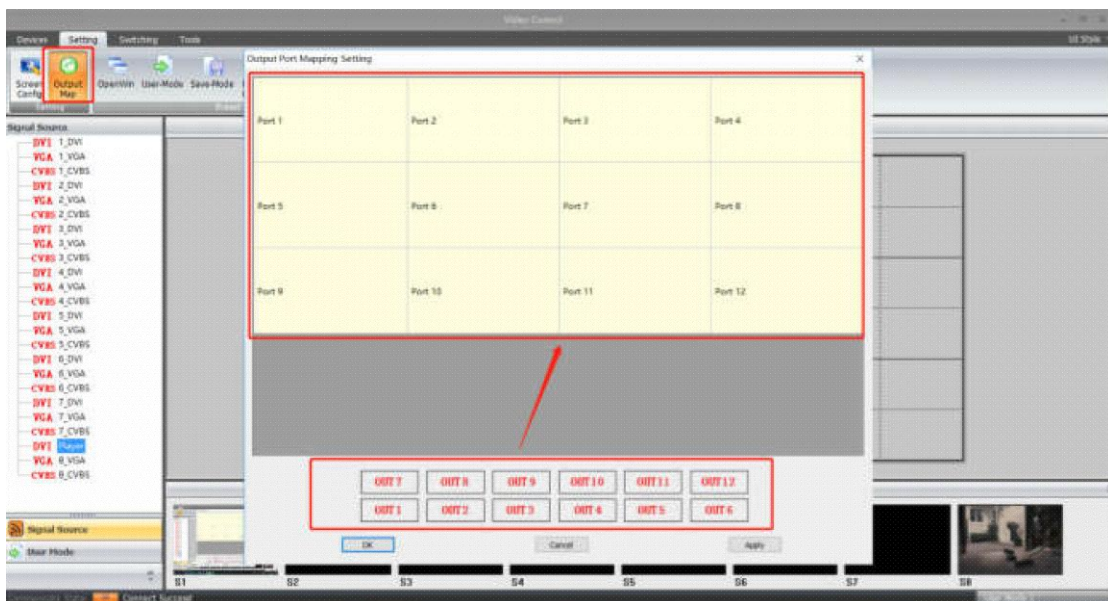
Drag the OUT1...OUT12 up to the Port1...Port12 to replace and adjust
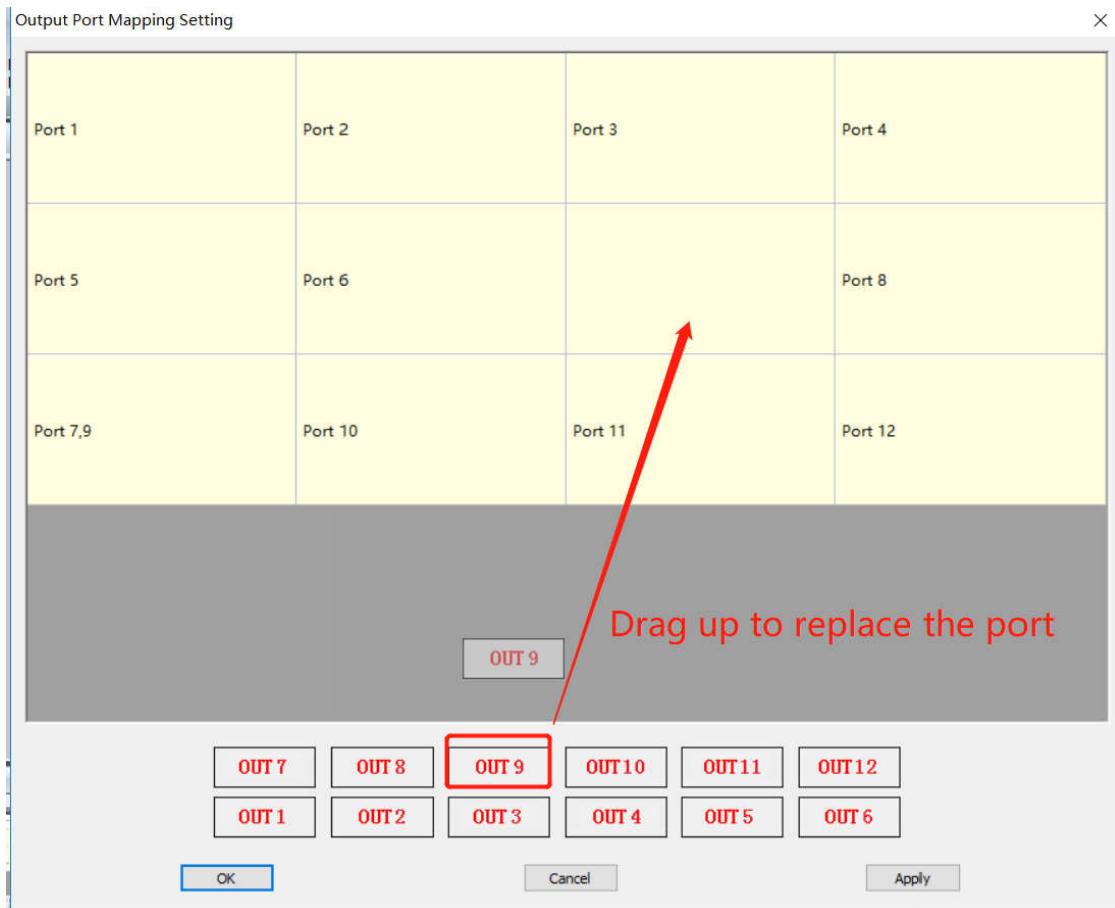
2: Open Win, User-mode, Save-Mode, Factory Default, Echo on/off

Open Win: to open a new window on the Video Wall
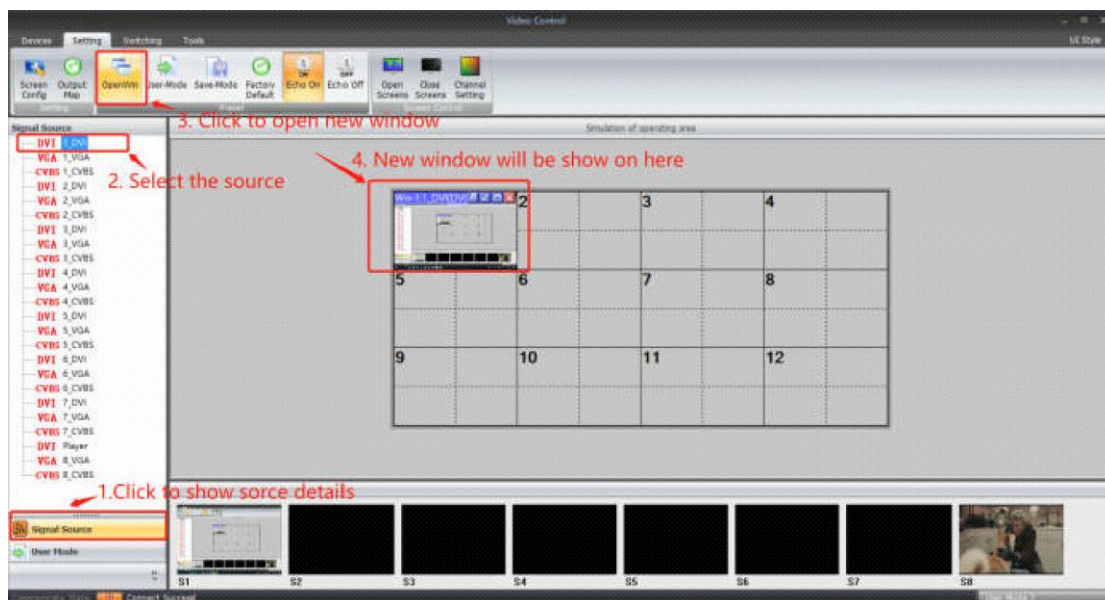
For open a window, it also can be done by pressing and holding left click of the mouse to drag and release on the video wall operation area, and users can adjust the window size by moving to the edge of the window:
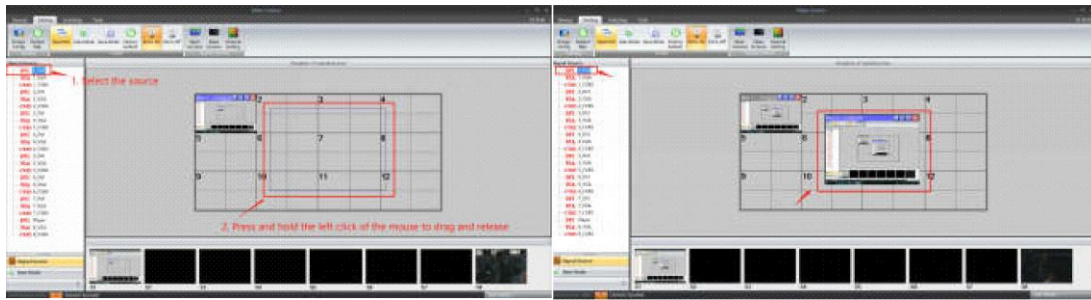
User-Mode: For recalling the saved user mode(presets), total can save 32 presets
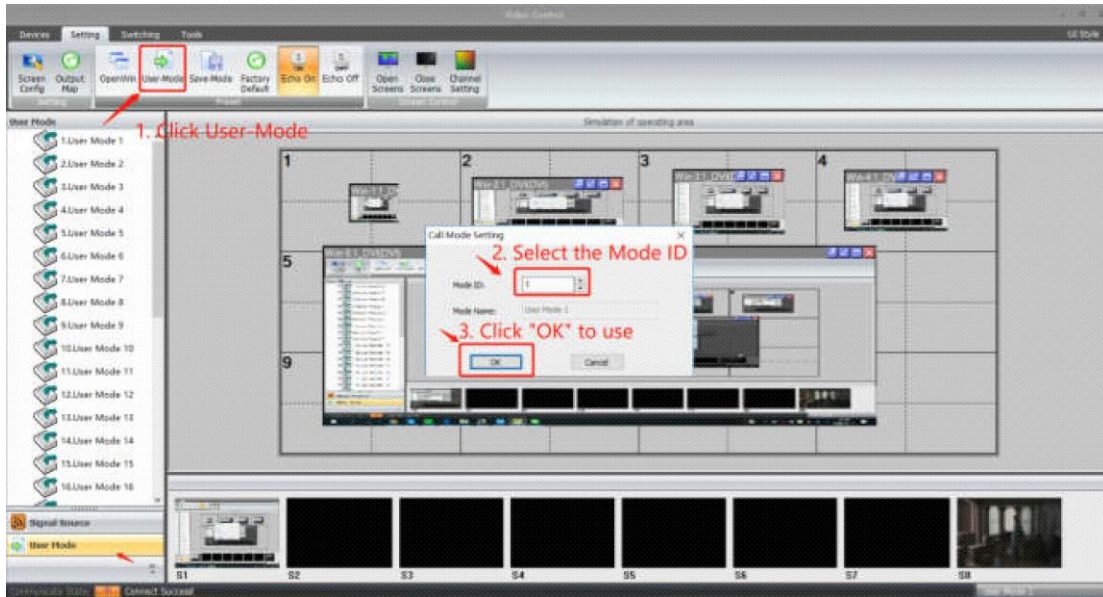
Save-Mode: For save the current settings as a user-mode/preset
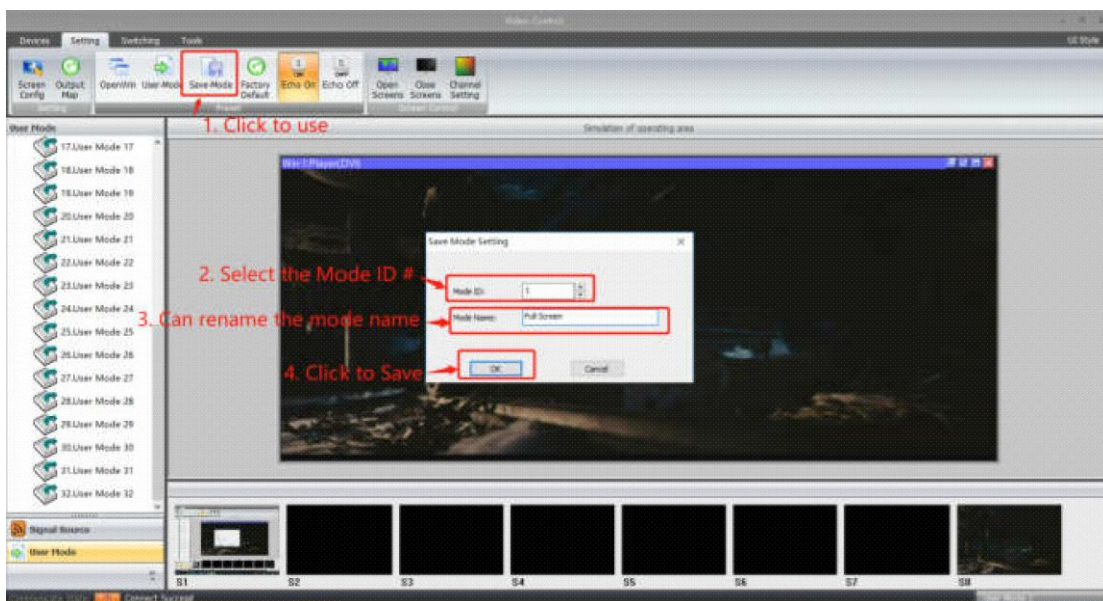
Factory default: Click this one will reset all the parameters as factory default mode
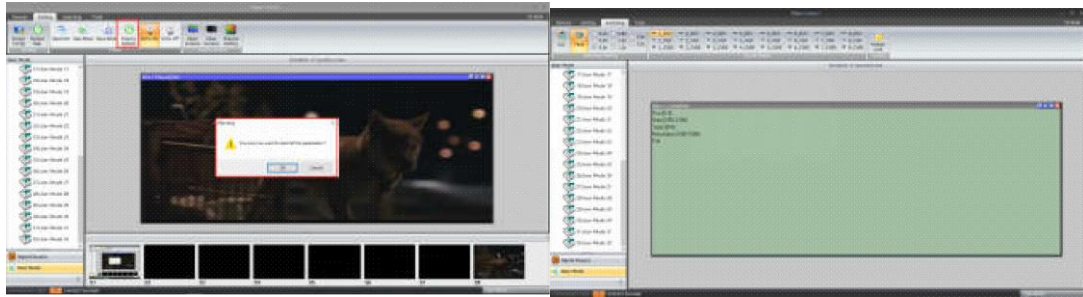
Echo On: Turn on the local preview function on the control PC(only support with 1000M Port)
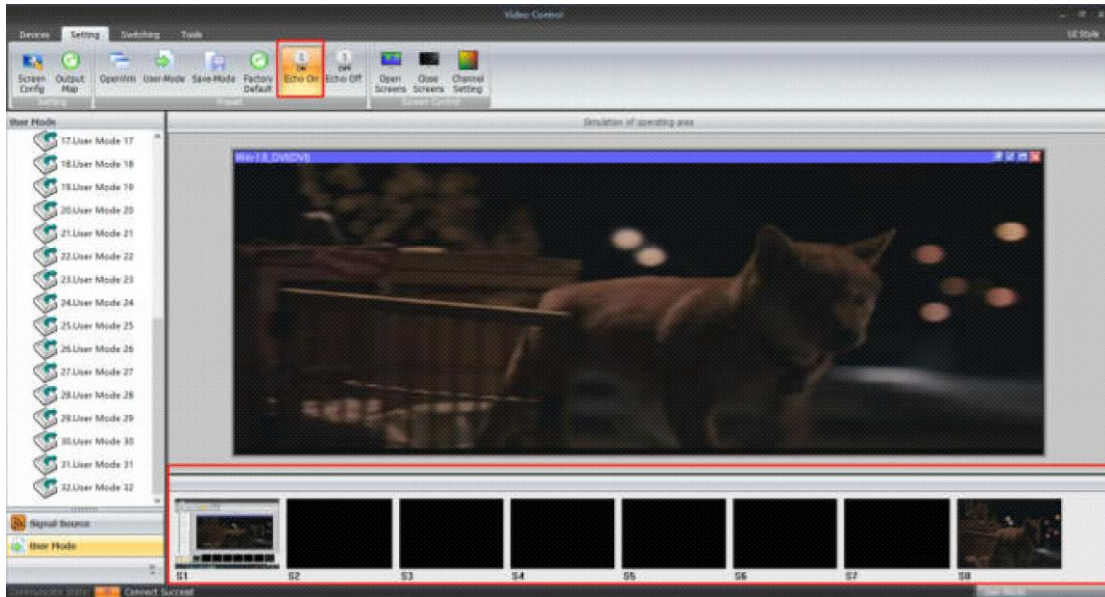
Echo Off: Turn off the local preview function on the control PC(only support with 1000M Port)
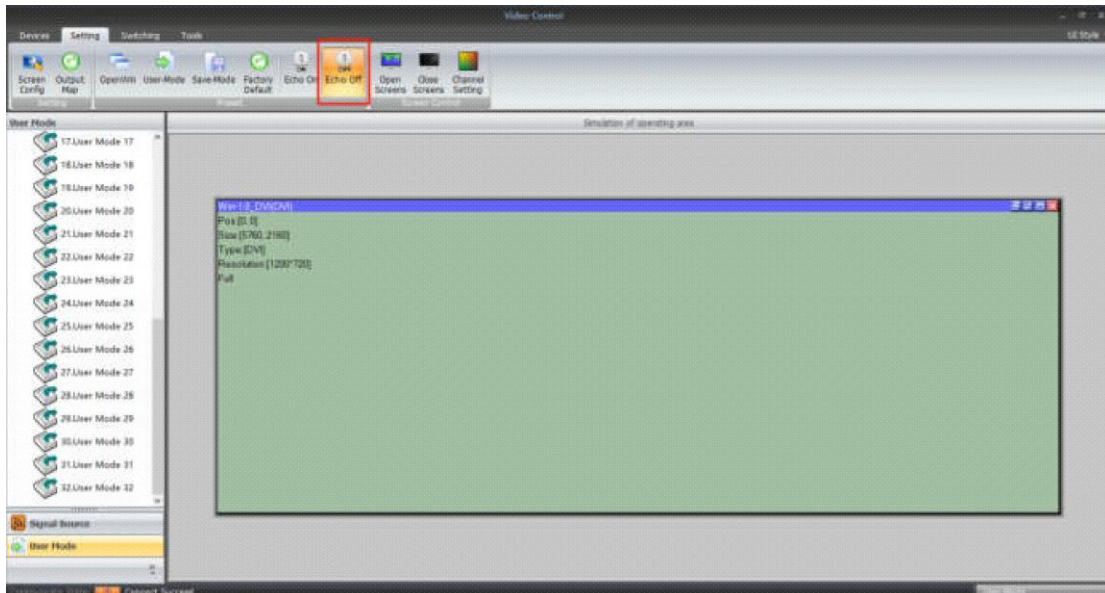
Screen Control: those functions are not available for this mode
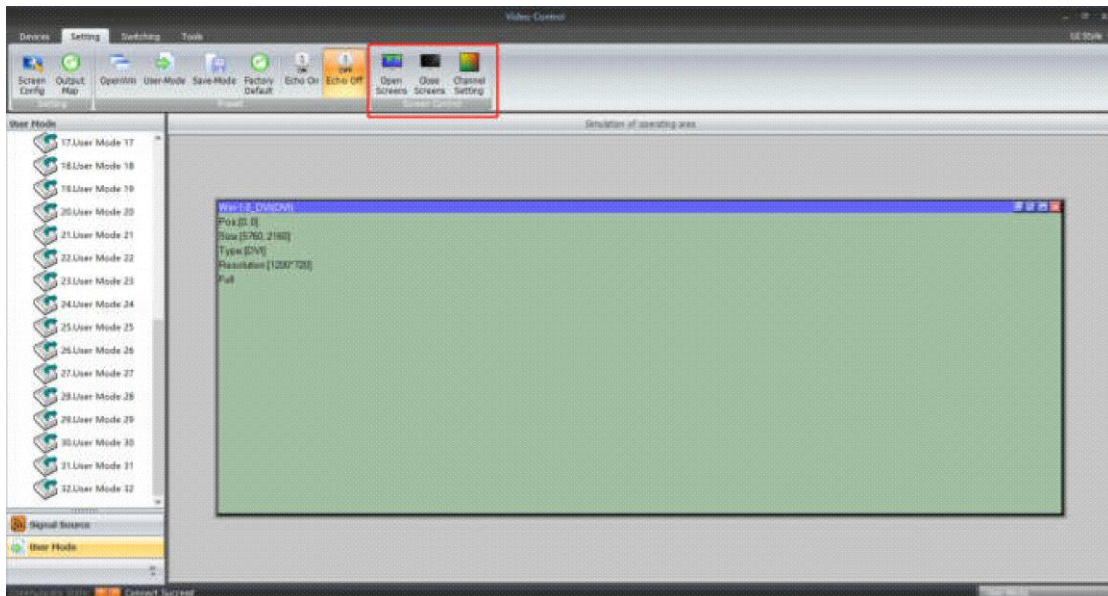
"Tools" interface

With interface, users can add more operation users here with different rights, language setting and also change to baud rate and IP address:
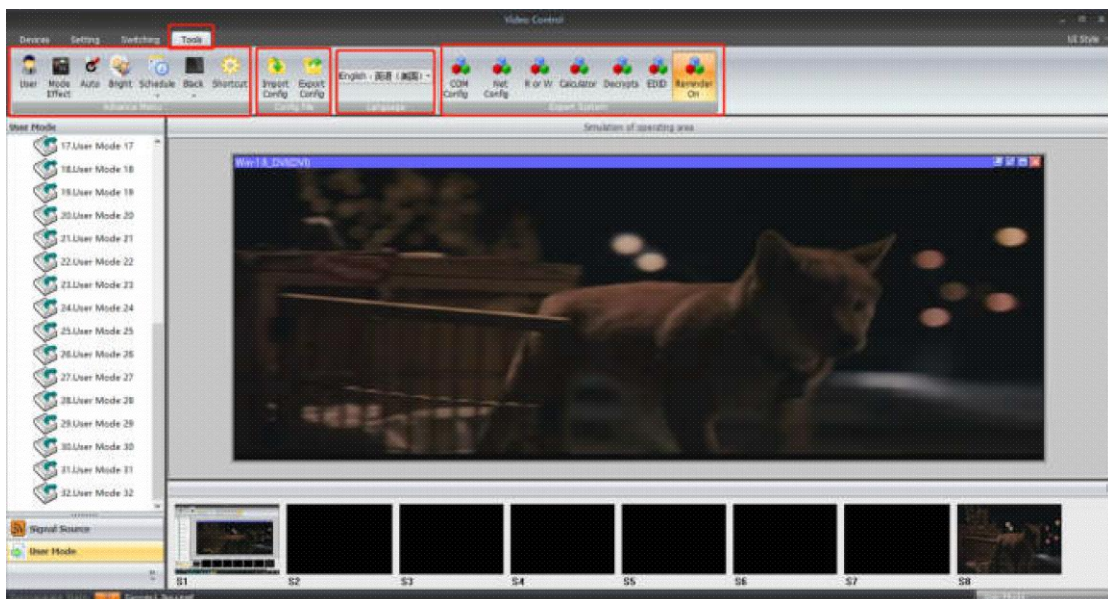
Users management: add new users or delete the users:
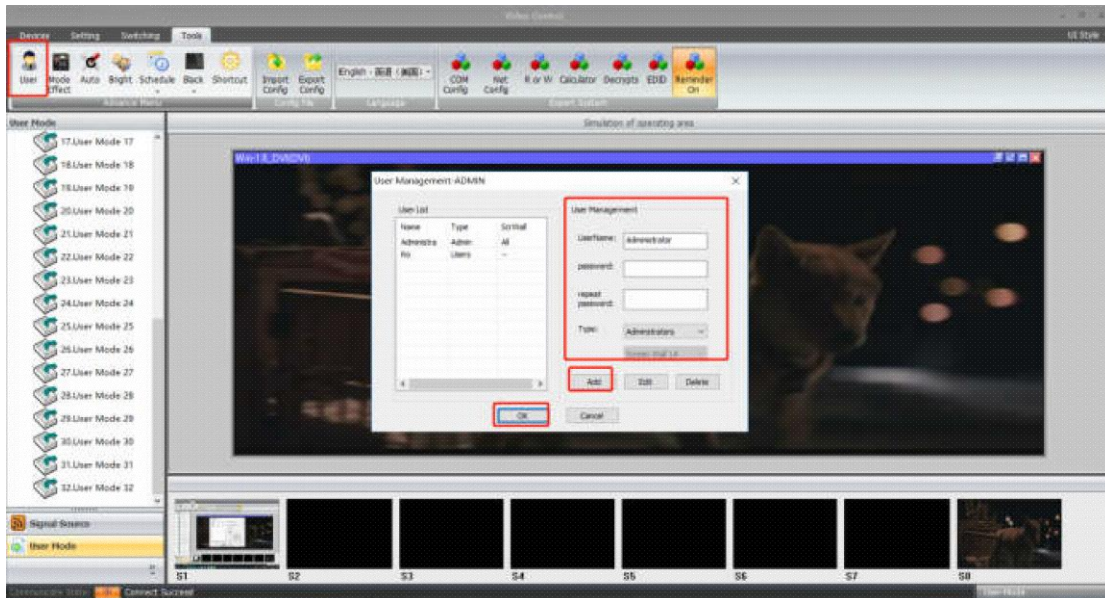
Mode switching effects setting: users can set up the switching effects(CUT or Fade)   and time while recall the save user-mode
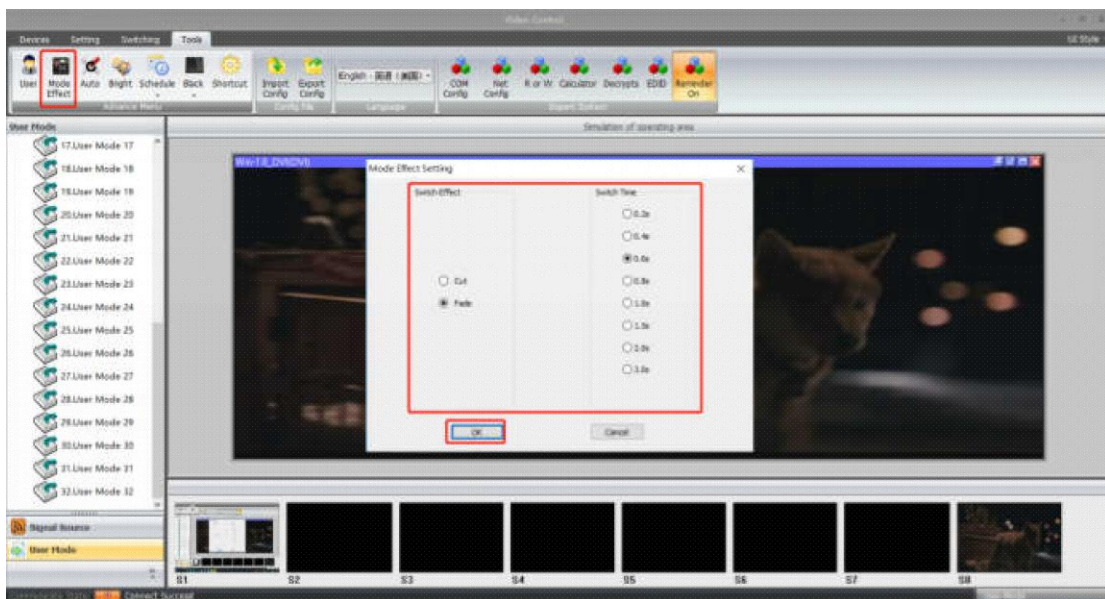
The Auto, Schedule and Shortcut are not functional on this mode:
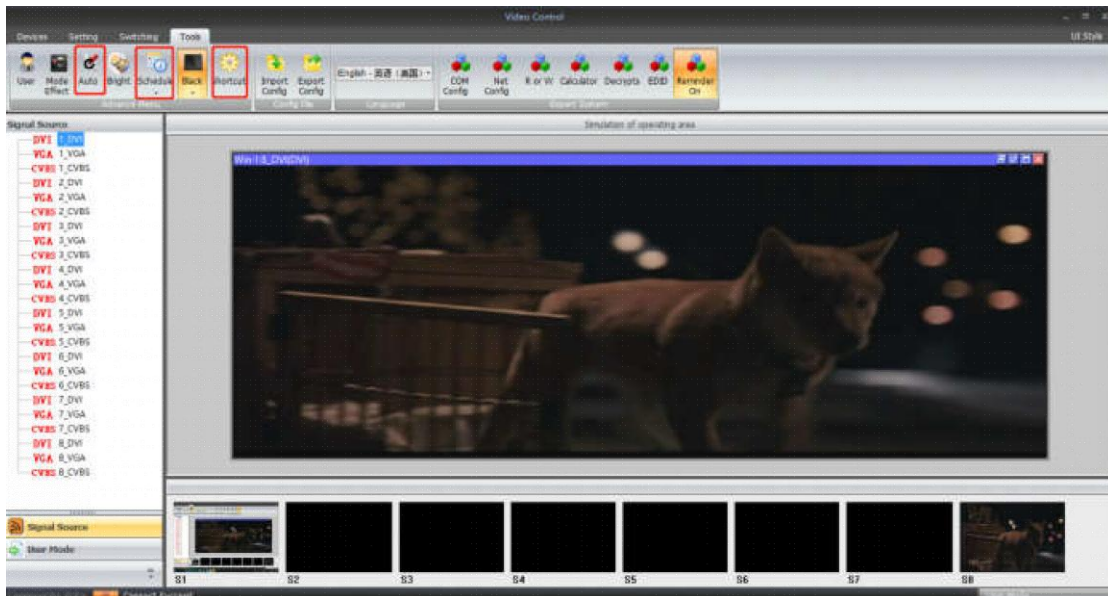
Bright: Users can adjust the brightness and Contrast of the output
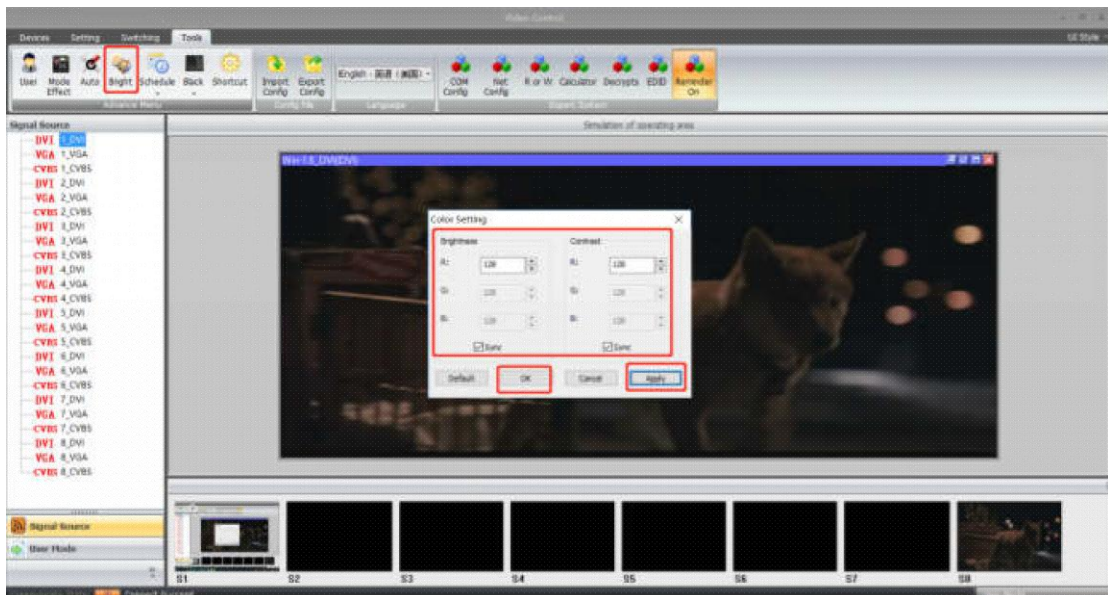
Black: Users can set up the output video as Black/Blue screen if the video not correct:
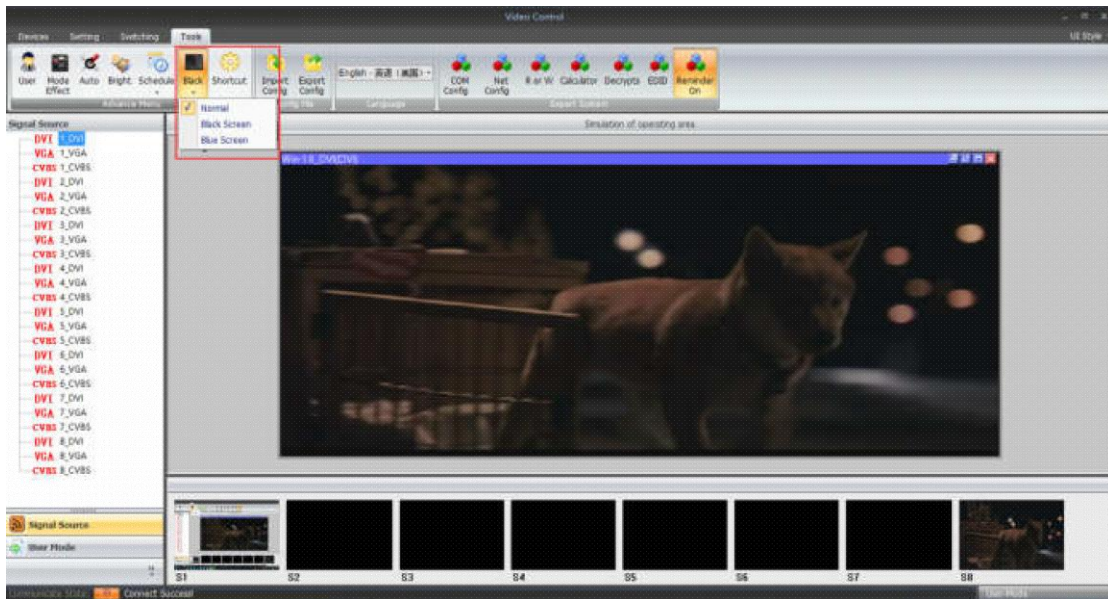
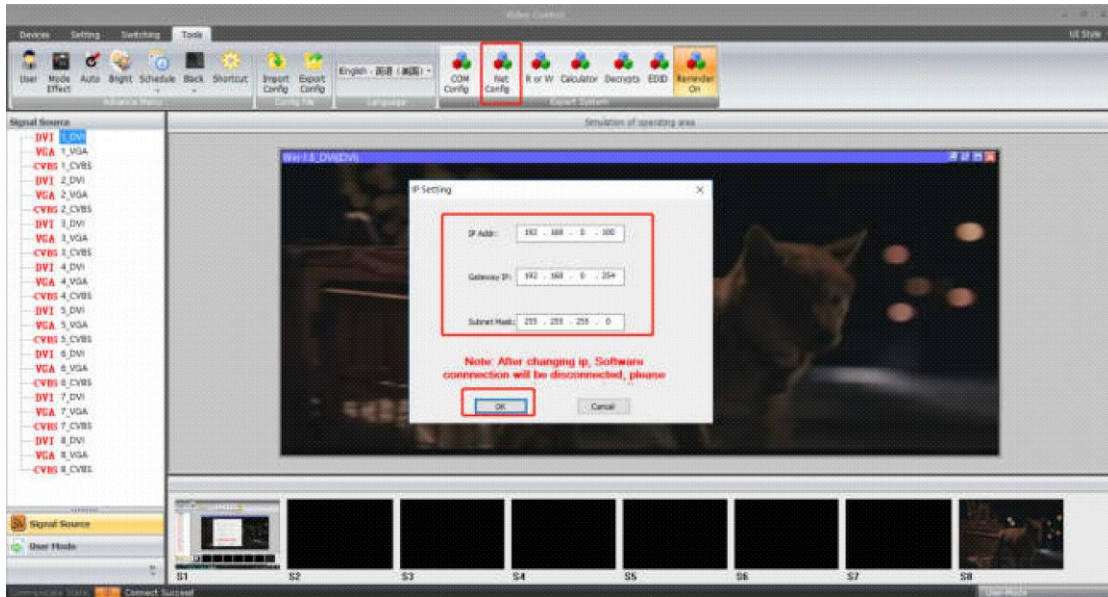Config file: for users to import or export the configurations
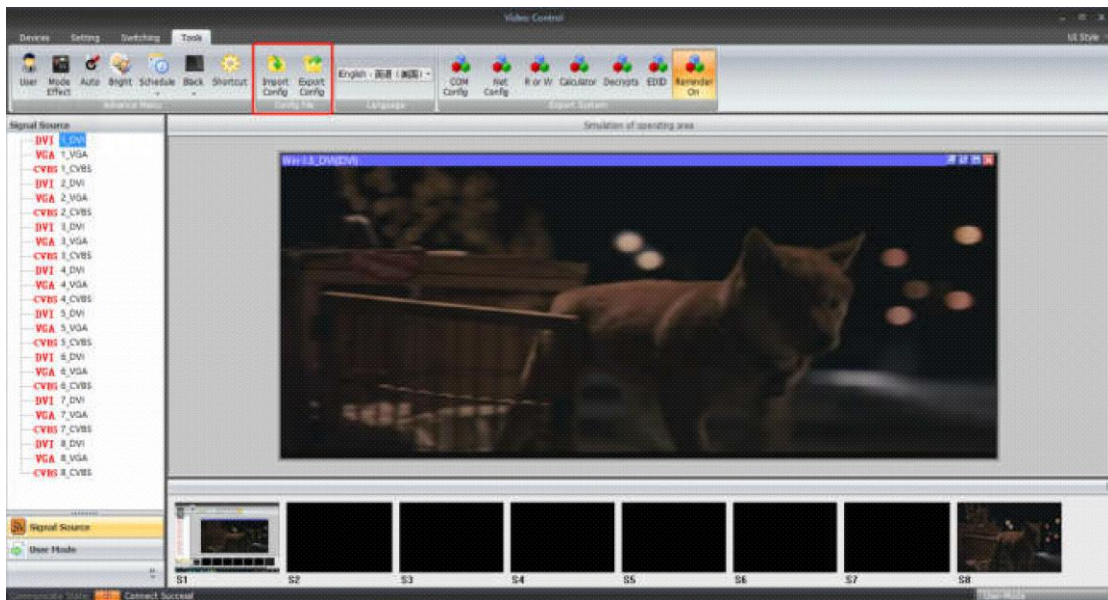
Language selection: At present, there are 3 languages for selections:
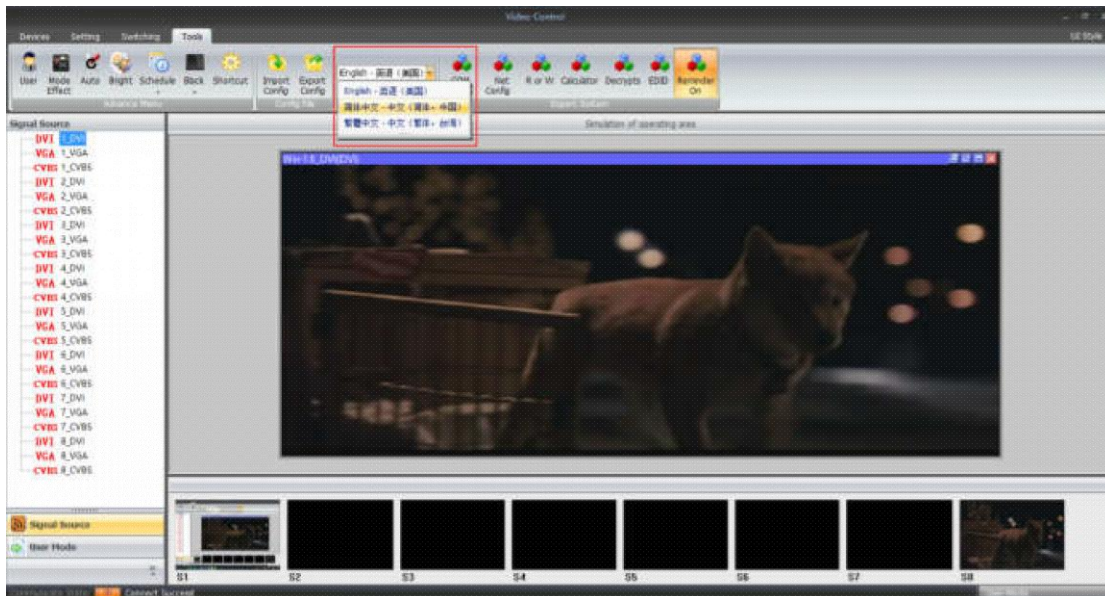
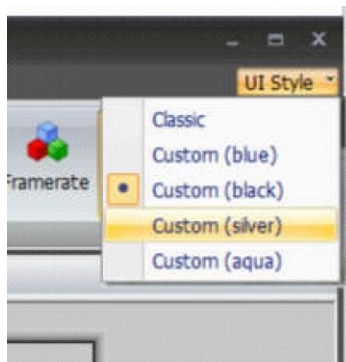COM Config: Users can change the baud rate here accordingly
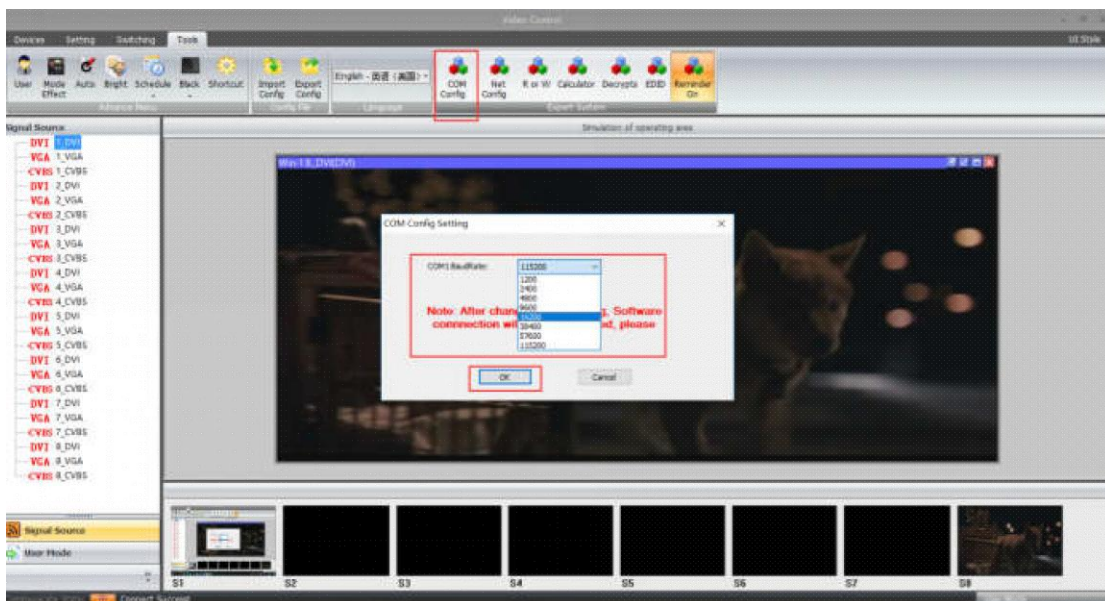
Net Config: Users can change the IP address of the controller accordingly to the application
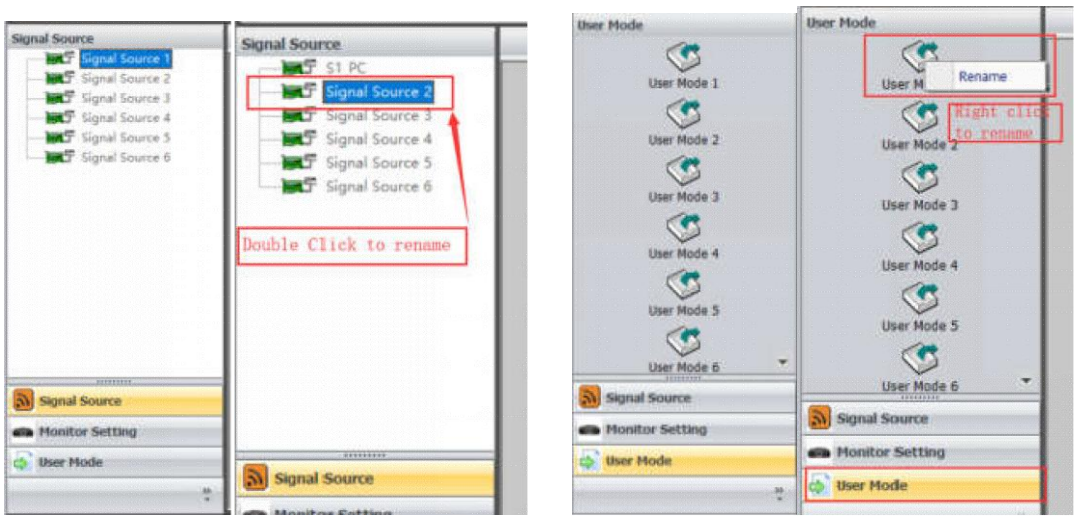
UI Style:

Users can set and select the UI style from here.

Other functions/Interfaces:

On the left side, users can find the Signal source, Monitor Setting and User Mode icons here. With different icons, it will show different contents:

For closing/moving windows:

For moving the window, users will only need to move the mouse the window, then press and hold the left click to move the window; For closing the window, users either can click the red "X" to close one by one or right click the mouse to find the "close all" function
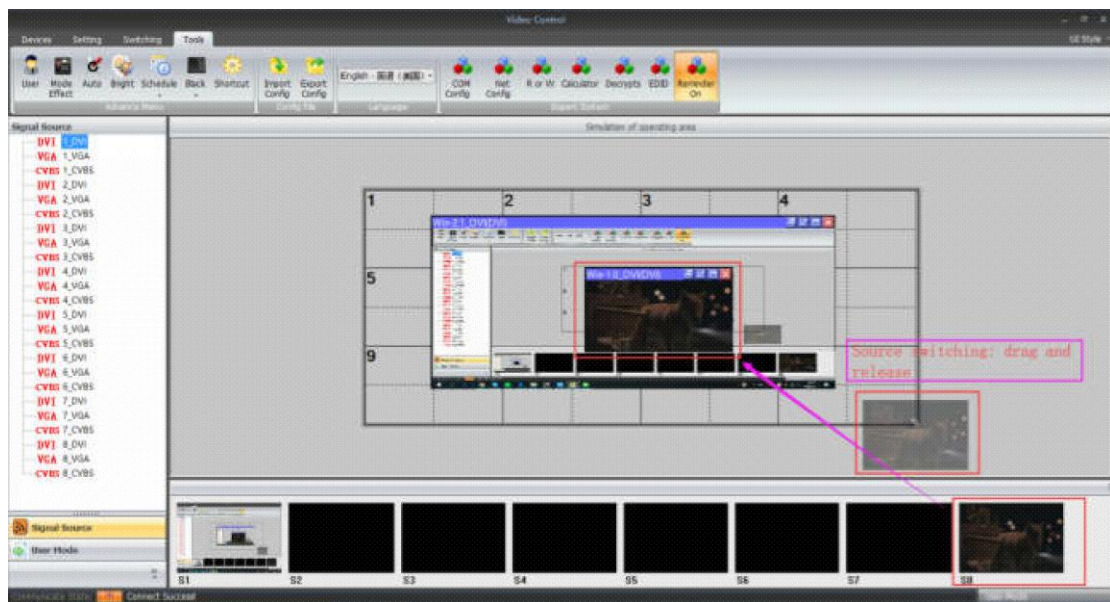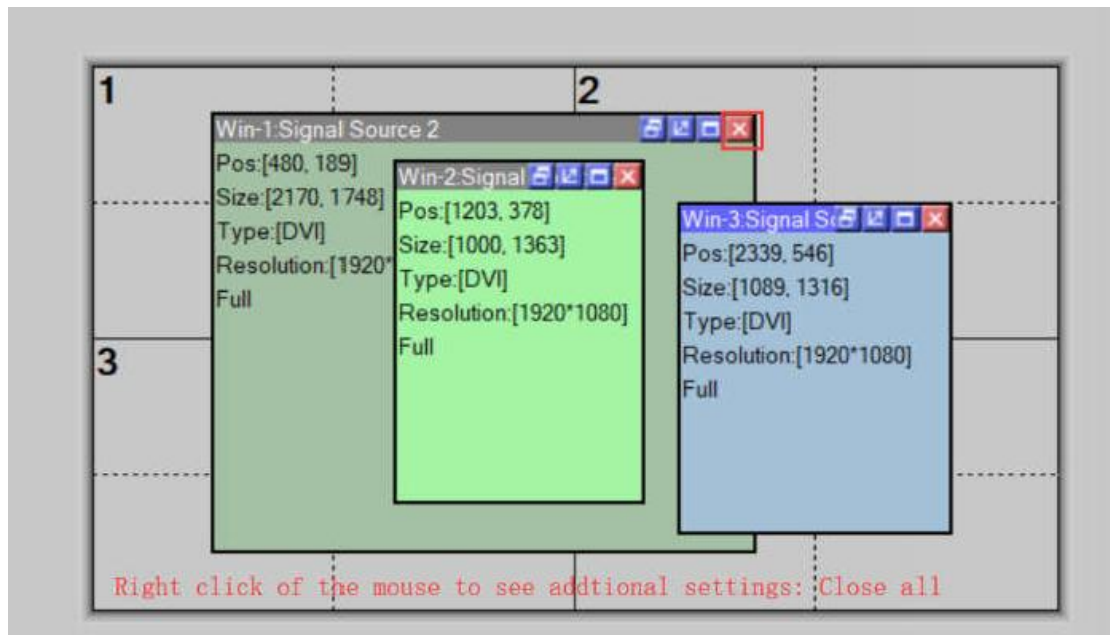
RS232 Control Commands

Connection: RS232

Baud rate:115200

Data bit: 8

Stop bit: 1, no parity bit

Data is hexadecimal data.

1) **Connection**

e9_01_01_00_00_Checksum_0d_0a

Connect equipment   e9_01_01_00_00_eb_0d_0a

2) Recall modes

e9_01_11_Mode_00_Checksum_0d_0a

Recall mode 1：e9_01_11_01_00_fc_0d_0a
Recall mode 2：e9_01_11_02_00_fd_0d_0a
Recall mode 3：e9_01_11_03_00_fe_0d_0a
Recall mode 4：e9_01_11_04_00_ff_0d_0a
Recall mode 5：e9_01_11_05_00_00_0d_0a
Recall mode 6：e9_01_11_06_00_01_0d_0a
Recall mode 7：e9_01_11_07_00_02_0d_0a
Recall mode 8：e9_01_11_08_00_03_0d_0a
Recall mode 9：e9_01_11_09_00_04_0d_0a
Recall mode 10：e9_01_11_0a_00_05_0d_0a
Recall mode 11：e9_01_11_0b_00_06_0d_0a
Recall mode 12：e9_01_11_0c_00_07_0d_0a
Recall mode 13：e9_01_11_0d_00_08_0d_0a
Recall mode 14：e9_01_11_0e_00_09_0d_0a
Recall mode 15：e9_01_11_0f_00_0a_0d_0a
Recall mode 16：e9_01_11_10_00_0b_0d_0a
Recall mode 17：e9_01_11_1a_00_0c_0d_0a
Recall mode 18：e9_01_11_1b_00_0d_0d_0a
Recall mode 19：e9_01_11_1c_00_0e_0d_0a
Recall mode 20：e9_01_11_1d_00_0f_0d_0a
Recall mode 21：e9_01_11_1e_00_10_0d_0a
Recall mode 22：e9_01_11_1f_00_11_0d_0a
Recall mode 23：e9_01_11_20_00_12_0d_0a
Recall mode 24：e9_01_11_21_00_13_0d_0a
Recall mode 25：e9_01_11_22_00_14_0d_0a
Recall mode 26：e9_01_11_23_00_15_0d_0a
Recall mode 27：e9_01_11_24_00_16_0d_0a
Recall mode 28：e9_01_11_25_00_17_0d_0a
Recall mode 29：e9_01_11_26_00_18_0d_0a
Recall mode 30：e9_01_11_27_00_19_0d_0a
Recall mode 31：e9_01_11_28_00_1a_0d_0a
Recall mode 32：e9_01_11_29_00_1b_0d_0a

Packing details:

Item Name	QTY	Unit
Video Wall Controller	1	Unit
User Manual	1	Pcs
Power cord	1	Pcs