SWMicro Video Wall Controller User Guide

This user guide provides basic instructions for setting up SEADA SolarWall Micro video wall controllers using its management software.

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1. Production Introduction

1.1. Product Profile

The SWMicro series video wall controllers are the all-in-one solution available from SEADA technology. Based on cutting edge Crossbar express technology, they provide excellent performance and flexibility for video wall applications.

SWMicro series controllers apply Crossbar technology to provide high bandwidth for real-time processing of all input signals and better system performance. The layout of the windows can be configured separately by the universal SWMicro management software, which offers flexibility within an intuitive interface.

SWMicro controllers are also able to offer extremely fast start-up performance and a working environment free of viruses and software conflicts, ensuring 24/7 hassle free operation ability.

1.2. Product Capability

- Advanced Crossbar technology
- 8 HDMI inputs
- Up to 16 HDMI outputs
- Multi clients' support
- User access control
- Robust FPGA video data process technology
- No PC vulnerabilities
- Two-window/Four-window overlay mode
- Lower power consumption
- Multi video walls support in one system
- HDCP compliant
- Supports custom pre-set layouts
- Layouts looping ability
- Arbitrary positioning and overlapping of windows on the video wall
- Picture-in-Picture display of two live, moving video input signals over any output screen

1.3. Specification & Parameters

Controller Chassis	19” ANST/EIA RS-310C standard industrial chassis
Input Channel	Up to 8 inputs
Input Format	HDMI
Output Channel	Up to 16 inputs
Output Format	HDMI
HDCP Support	Yes
Power Supply	Single
Input Voltage	AC 100V to 240V, 50/60Hz
Operation System	Windows 7/8/10
Warranty	2 years
Operating temperature range	0~40 degrees centigrade
Operating humidity range	10%~90%
Storage temperature range	0~60 degrees centigrade
Storage humidity range	10%~90%
Control Interface	RS232 or 10/100/1000M Ethernet Port

1.4. Models and Scales

Models	Chassis	Dimension (mm) (W*D*H)	HDMI Inputs	HDMI Outputs
SWMicro08	1.5U	482*350*66	8	8
SWMicro12	1.5U	482*350*66	8	12
SWMicro16	1.5U	482*350*66	8	16

2. Hardware Overview (SWMicro12 as an example)

2.1. Rear Panel

- **LAN (10M/100M/1000M) and RS232-IN Port are for PC control**
- **HDMI Inputs**

8 x HDMI 2.0 inputs with embedded audio

- **HDMI Outputs**

16 x HDMI 2.0 outputs with embedded audio

- **Power Supply Socket and Switcher**

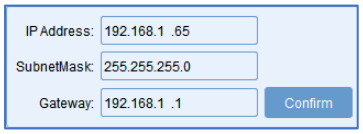
110 ~ 240VAC

- **RS232-OUT port and RUN ENG switcher are for future development**

3. Connection Setup

3.1. Ethernet (LAN) Connection

Connect the SWMicro unit with the control PC using CAT cable. Make sure the PC is in the same group of static IP address as SWMicro.



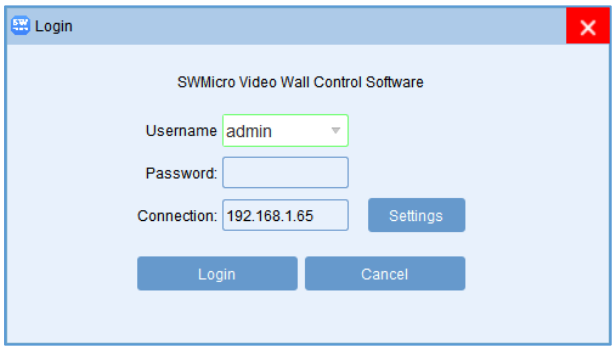
Left is the default IP setting of SWMicro. Users can change the IP address once connected.

3.2. RS232 (Serial Port) Connection

RS-232 control, baud rate 115200, DB9 connector.

4. SWMicro Software User Guide

Users can run the SWMicro.exe software directly without installation. Software can be downloaded from the SEADA website (https://seada.co.uk/downloads). Double click the SWMicro software to get the Dialog box as below.



Default password for 'admin': **admin**.

By clicking '**Settings**', users can either choose to control SWMicro via LAN or Serial Port. The default connection setting for SWMicro is '**LAN connection**'.

- **LAN connection**

The default static IP address for SWMicro is 192.168.1.65. Users need to change the IP address of their control PC to static IP address and the same network segment as SWMicro at TCP/IPv4 in '**Ethernet Properties'**.

IP address: any address between 192.168.1.2 and 192.168.1.254 except the address which has been taken by SWMicro.

Subnet Mask: 255.255.255.0

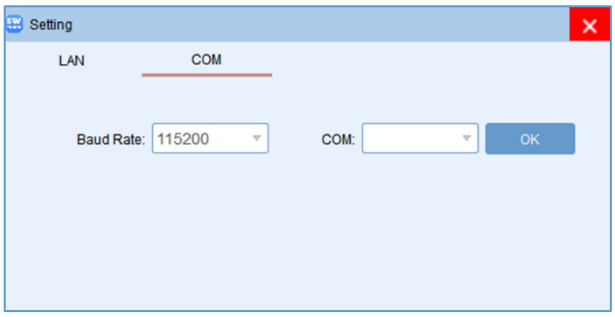
Default Gateway: 192.168.1.1

Connect SWMicro with a CAT cable to the control PC (cable included in the package):

- Select the '**Username**'.
- Type in the '**Password**'.
- Click '**Login**' to continue.

• **Serial Port connection**

Users can also connect SWMicro with a serial cable to the control PC (cable included in the package):

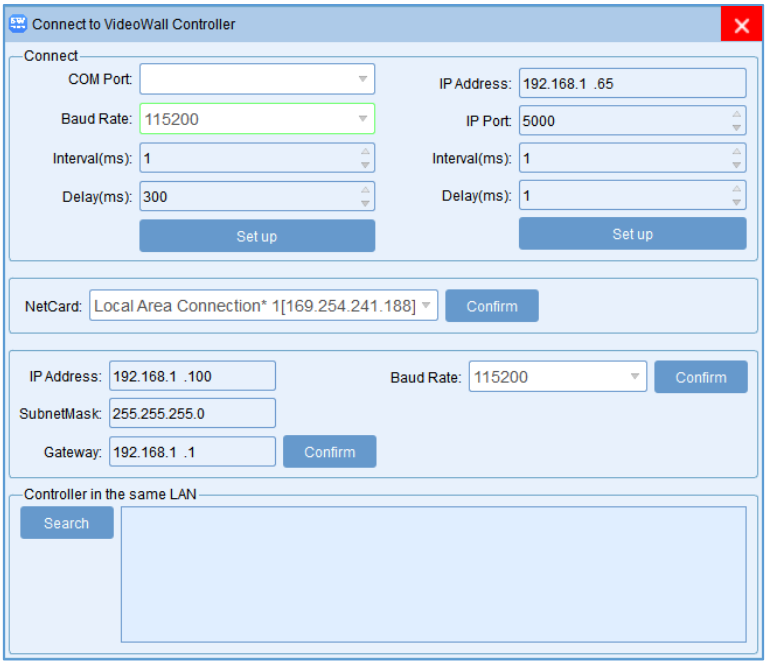


- Click '**Settings**'.
- Choose '**COM**'.
- Choose the Serial Port (COM).
- Click '**OK**' and '**Login**' to continue

SWMicro will be connected automatically after login. If not, please refer to '**Troubleshooting**' section in this user manual.

4.1. Video Wall Settings

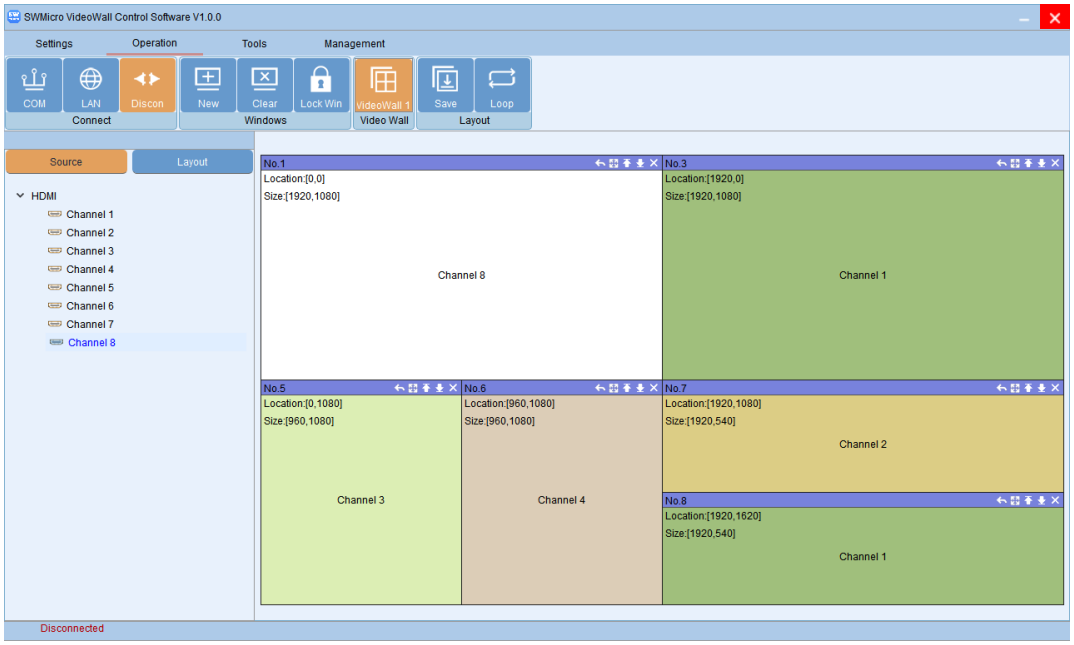
4.1.1. Connection



Users can find all the device network information in this window and do the modification if needed.

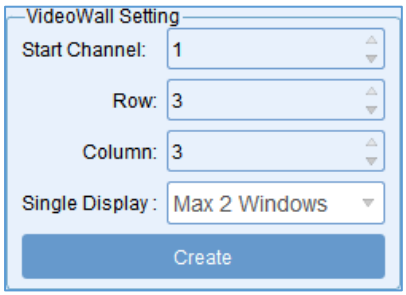
The first section is used to set the connection of the control PC to SWMicro. The second section sets the NetCard for the connection. The third section can be used to adjust the default IP address and baud rate of SWMicro for further use.

Users can also find the IP address of SWMicro using '**Search**' which only requires either RS232 or ethernet connection.



4.1.2. Video Wall Settings

A. Video Wall Layout Setup

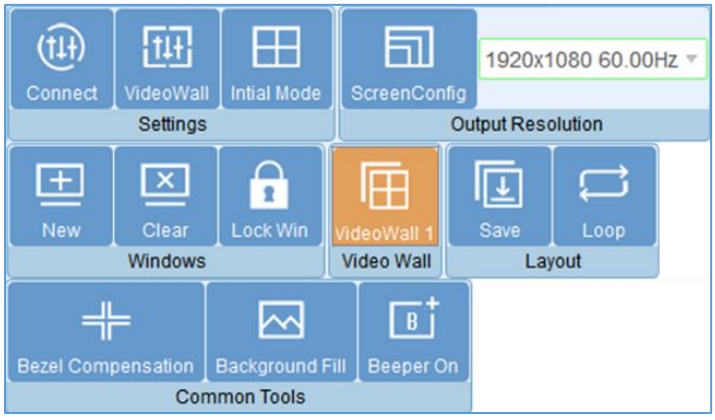


Users can set up the layout of the video wall in '**VideoWall Setting**' by simply choosing the number of rows and columns in the video wall. Total screen amount is up to 8/12/16 for SWMicro video wall controllers depending upon the model type.

Users can also set up either 2 or 4 windows in a single output screen to achieve 'picture-in-picture'.

Note: In the '**Max 4 windows**' mode, the second screen will loop out and repeat the output on the first screen. In this case, half of the outputs can be used to display different contents. For example, when using '**Max 4 windows**' mode, in the case there are 8 outputs, output '**1, 3, 5, 7**' will display the assigned contents and output '**2, 4, 6, 8**' will loop out the contents on the former outputs.

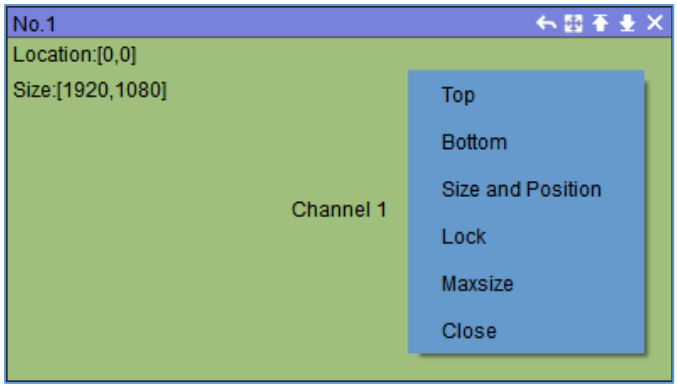
B. Creative the video wall



Once SWMicro is connected to the control PC, it will load the settings used from last time. The default setting for the new unit out of package is 2x4/3x4/4x4 video wall with input 1 across the screens depending upon the SWMicro model type. All outputs are set at a resolution of 1920x1080@60hz. The basic function of each tab on the main window for setting up a video wall will be:

(More details will be available in the following sections.)

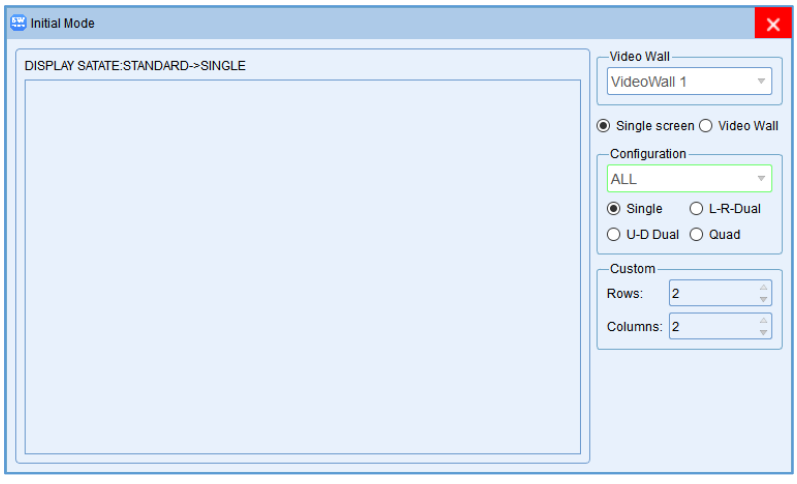
- **VideoWall:** Set up the video wall layout.
- **Initial Mode:** Set up the initial splicing of each output screen or all output screens.
- **ScreenConfig:** Add and modify customised output screen resolutions.
- **New:** Set up windows on the screen according to the initial mode. Two other ways can open a new window onto video wall as well by drag & drop and drawing in the video wall display area.
- **Clear:** Close all existing windows on the video wall.
- **Lock Win:** Lock all windows in the video wall display area to avoid accidental adjustment.
- **Save/Loop:** Save/Load pre-set video wall layouts and loop saved layouts on the output screen.
- **Bezel Compensation:** Correct the bezels of the output screen.
- **Background Fill:** Change the background colour of the output screen.



Right click on the video wall, users can use the tools in '**Dropdown menu**' to set up each window individually. Some of these functions can be accessed using the tool bar on the right-top of each window.

- **Top:** Bring the selected window to top of all windows.
- **Bottom:** Send the selected window to bottom of other windows.
- **Size and Position:** Modify the size and position of the selected window.
- **Lock:** Lock the selected window to avoid accidental adjustment.
- **Maxsize:** Maximise the size of the selected window to the whole video wall.
- **Close:** Close the selected window.

C. Initial Mode

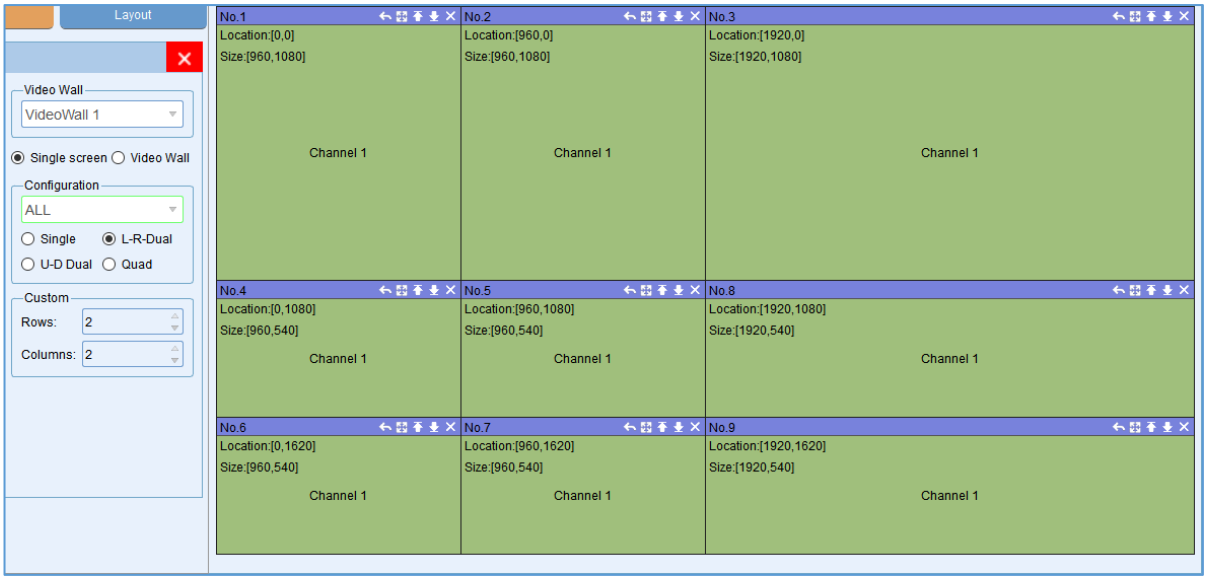


Instead of self-modifying the video walls each time, users can select the '**initial mode**' to save pre-set configuration for each output screen or all output screens.

- **Single Screen:** Each screen can be configured into 4 different modes individually: single window, left-right dual windows, up-down dual windows and quad windows.
- **Video Wall:** The video wall will be covered by '**A**x**B**' windows with an equal size, where '**A**' is the number of windows in the row and '**B**' number of windows in the column.

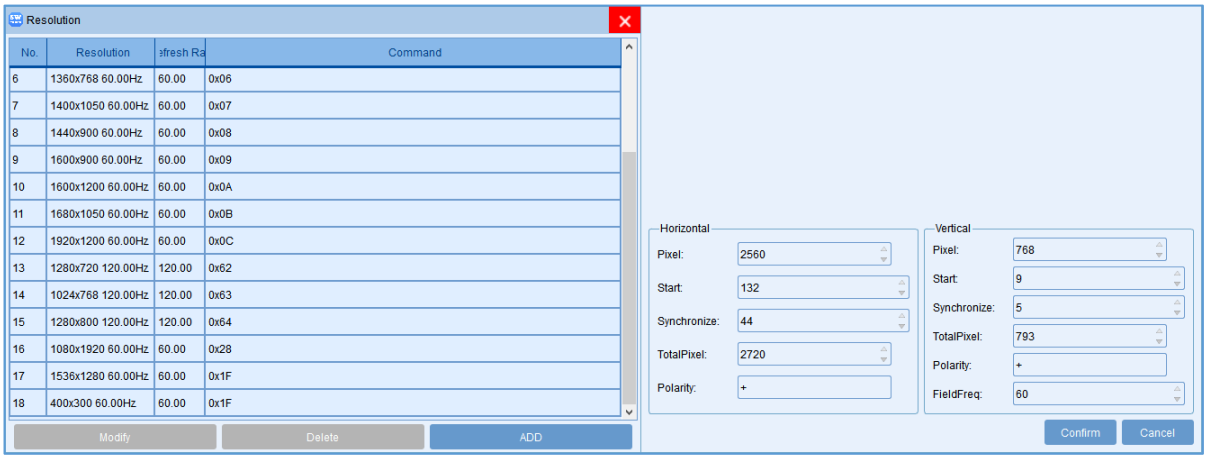
Note: The number of windows in each screen still follows the '**Single Display**' configuration in '**VideoWall Setting**'.

After all settings are done, close the window and click '**New**' under '**Operation**', the saved video wall will be generated automatically on the main window as shown below.



D. Screen Configuration

Users can add customised screen resolutions for the video wall.



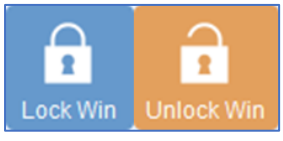
4.2. Operations

4.2.1. New/Clear Window

Users can load the pre-set video wall from the '**initial mode**' by clicking '**New**'. The default setting for the software is a single window from input 1 in each output screen. Two other ways can open a new window onto video wall as well by drag & drop and drawing in the video wall display area.

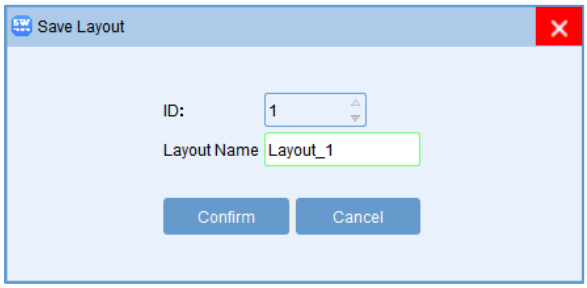
By clicking '**Clear**', all the windows on the current video wall will be closed.

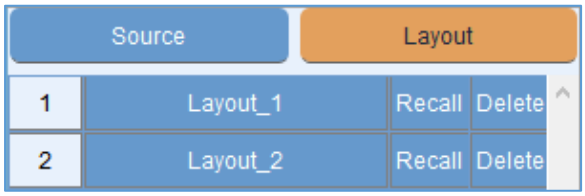
4.2.2. Lock/Unlock Window

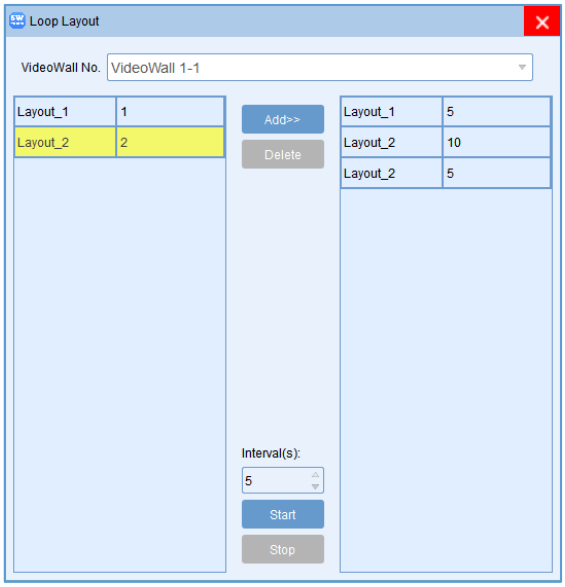


By clicking '**Lock Win**', all the windows on the current video wall will be locked to avoid accidental adjustments. Each window can also be locked separately using the '**Lock**' option in the '**Dropdown menu**'. Users can cancel the lock of windows by clicking '**Unlock Win**'.

4.2.3. Save/Recall and loop Layouts







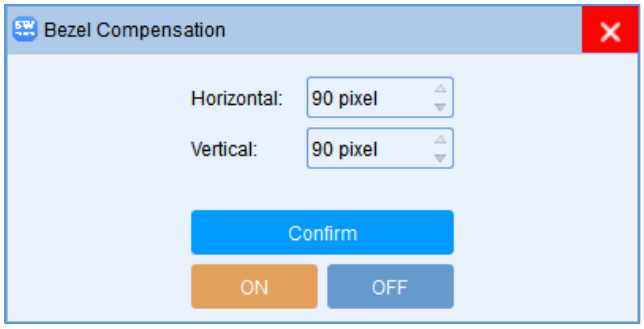
Users can save the video wall layouts and recall them later via the '**Layout**' menu on the left of the software. Users can save up to 32 pre-set layouts.

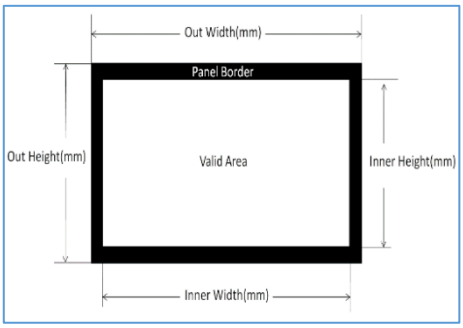
Note: The layouts are saved on SWMicro, therefore whenever the control PC is connected, the software can load the saved layouts from SWMicro.

Users can also loop the saved layouts at a pre-set interval (minimum 5 seconds).

4.3. Common Tools

4.3.1. Bezel Compensation

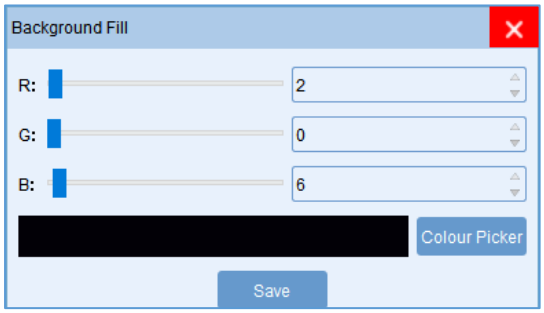


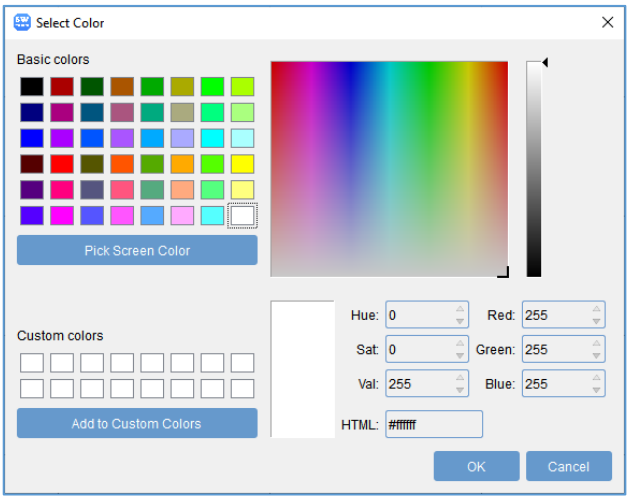


Users can set up the bezel correction for the video walls here to compensate the frame of the screens to make the whole video wall look like one large screen without any distortion. Users can use pixels of the screen frame width to set up the bezel correction here. The bezel compensation can be set either ON or OFF for comparison.

Note: '**Horizontal**' is the summarisation of inner and outer height and '**Vertical**' stands for the summarisation of inner and outer width.

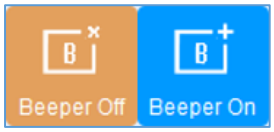
4.3.2. Background Fill





Users can set up the background colour for the video wall here. Users can either use the slider bars or the colour picker to choose the background colour for the video wall.

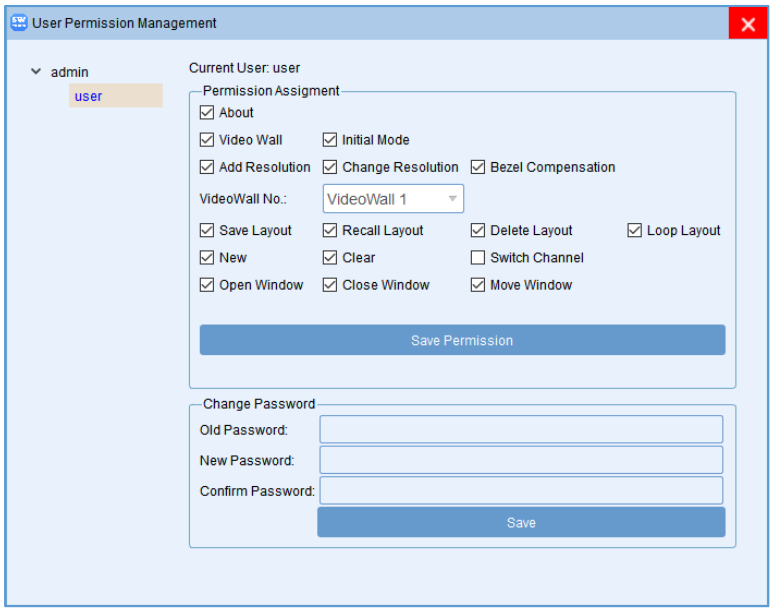
4.3.3. Beeper On/Off



Users can set the beeper in SWMicro to '**ON**'. SWMicro will give an alarm each time when an operation has been performed in the software. The function can be switched off by clicking the button again to set it to '**Beeper Off**'.

4.4. User Management

4.4.1. User Permission Setup



'**Admin**' can add and delete users to access the SWMicro software.

'**Admin**' can also set up levels of permission for different users to access the software. Once the permission is saved for a particular user, he/she will have a restriction of accessing functions of the software, either unable to see the function icon or receive a warning when accessing the function. The user permission can only be assigned by '**admin**'.

4.4.2. User Password Setup

'**Admin**' can set up the password for different users without knowing the old password of that user.

'**User level**' can also change the password by themselves, while they need to enter the old password.

5. Troubleshooting

5.1. Corrupted Characters

a) Open '**Clock and Region**' in '**Control Panel**'.
b) Select '**Change data, time or number format**'.
c) Select '**Change system locale**' under '**Administrative**' tab.
d) Tick '**Beta: Use Unicode UTF-8 for worldwide language support**', click '**OK**' and '**Apply**'.

5.2. No Connection

a) Ensure the SWMicro is powered up.
b) Ensure the PC and SWMicro at the same IP group.
c) Ensure the IP address is correct for SWMicro.
d) Restart the SWMicro software.

5.3. No Output

a) Ensure the video source is on.
b) Ensure the SWMicro and screens are powered on.
c) Ensure the connection to screens are OK.
d) Ensure that the output resolution is set up correctly. (i.e., if the output resolution is at 1080p and the screen only takes 720p.)

6. SWMicro Command Lines

• All spaces shown in the command are required.
• All commands in this section are always terminated with the ASCII carriage-return character, 0x0d. This is represented by the ⏎ symbol in each command.

➢ Serial Port:
Baud rate: 115200

➢ UDP Socket:
Module default IP: 192.168.1.65
Target port: 5000
Local port: 5001

All commands sent via UDP must include an 8-bytes header.
header[0]: 0x00
header[1]: 0x04
header[2]: 0x00
header[3]: 0x00
header[4]: the first segment of the device IP address, for example '192' from '192.168.1.65'.
header[5]: the second segment of the device IP address, for example '168 from '192.168.1.65'.
header[6]: the third segment of the device IP address, for example '1' from '192.168.1.65'.
header[7]: the fourth segment of the device IP address, for example '65' from '192.168.1.65'.

For example: Close all windows on the screen for device (192.168.1.65)

00 04 00 00 c0 a8 01 41 3c 72 73 65 74 2c 30 3e

Black: Headers (Don't change)

Coloured: Device IP address

Red: Converted serial port commands to hex

6.1. Create a new display window

6.1.1. Serial Port

<open,W_ID,SourceChl,SourceType,x0,y0,x1,y1>
W_ID: Window ID, starts from 1.
SourceChil: Input channel, starts from 0.
SourceType: Inputs type, fixed at 0.
x0: The horizontal start of the window, starts from 0.
y0: The vertical start of the window, starts from 0.
x1: The horizontal end of the window.
y1: The vertical end of the window.

For example:

Create window 1	<open,1,0,0,0,0,1919,1079>
Create window 2	<open,2,0,0,2290,113,4587,1234>
Create window 3	<open,3,0,0,692,1400,2981,2574>
Create window 4	<open,4,0,0,787,1786,5106,3037>

UDP Socket

Open a new window on window 1 from input source 1

00 04 00 00 c0 a8 01 41 3c 6f 70 65 6e 2c 31 2c 30 2c 30 2c 30 2c 30 2c 31 39 31 39 2c 31 30 37 39 3e

6.2. Move the windows and switch the sources

6.2.1. Serial Port

<move,W_ID,SourceChl,SourceType,x0,y0,x1,y1>

W_ID: Window ID, starts from 1.

SourceChil: Input channel, starts from 0.

SourceType: Inputs type, fixed at 0.

x0: The horizontal start of the window, starts from 0.

y0: The vertical start of the window, starts from 0.

x1: The horizontal end of the window.

y1: The vertical end of the window.

For example:

Move window 1	<move,1,0,0,0,0,959,539>
Move window 2	<move,2,0,0,0,0,1919,1079>
Switch window 1 with input channel 2	<move,1,1,0>
Switch window 2 with input channel 3	<move,2,2,0>

6.2.2. UDP Socket

Move window 1

00 04 00 00 c0 a8 01 41 3c 6d 6f 76 65 2c 31 2c 31 2c 30 2c 30 2c 30 2c 39 35 39 2c 35 33 39 3e

Switch window 1 with input channel 2

00 04 00 00 c0 a8 01 41 3c 6d 6f 76 65 2c 31 2c 31 2c 30 3e

6.3. Close all output windows

6.3.1. Serial Port

<reset,wallID>

wallID: Video wall display group ID, starts from 0.

For example:

Close all the window of video wall group 1.

<rset,0>

6.3.2. UDP Socket

Close all the windows of video wall group 1

00 04 00 00 c0 a8 01 41 3c 72 73 65 74 2c 30 3e

6.4. Layout save

6.4.1. Serial Port

<save,mode,groupID,modeIndex,sname>
groupID: fixed at 0.
modeIndex: Layout mode serial number starts from 0
Sname: Layout mode name.

For example:

Save layout 1 and name is Layout_1	<save,mode,0,0,004c00610079006f00750074005f0031>
Save layout 2 and name is Layout_2	<save,mode,0,1,004c00610079006f00750074005f0032>
Save layout 3 and name is Layout_3	<save,mode,0,2,004c00610079006f00750074005f0033>
Save layout 4 and name is Layout_4	<save,mode,0,3,004c00610079006f00750074005f0034>

6.4.2. UDP Socket

Save Layout mode 1 and mode name is Layout_1
00 04 00 00 c0 a8 01 41 3c 73 61 76 65 2c 6d 6f 64 65 2c 30 2c 30 2c 30 30 34 63 30 30 36 31 30 30 37 39 30 30 36 66 30 30 37 35 30 30 37 34 30 30 35 66 30 30 33 31 3e

Save Layout mode 2 and mode name is Layout_2
00 04 00 00 c0 a8 01 41 3c 73 61 76 65 2c 6d 6f 64 65 2c 30 2c 31 2c 30 30 34 63 30 30 36 31 30 30 37 39 30 30 36 66 30 30 37 35 30 30 37 34 30 30 35 66 30 30 33 32 3e

6.5. Layout recall

6.5.1. Serial Port

<load,mode,groupID,modeIndex>
groupID: fixed at 0.
modeIndex: Layout mode serial number starts from 0

For example:

Recall layout 1	<load,mode,0,0>
Recall layout 2	<load,mode,0,1>
Recall layout 3	<load,mode,0,2>

6.5.2. UDP Socket

Recall Layout Layout_1
00 04 00 00 c0 a8 01 41 3c 6c 6f 61 64 2c 6d 6f 64 65 2c 30 2c 30 3e

Recall Layout Layout_3
00 04 00 00 c0 a8 01 41 3c 6c 6f 61 64 2c 6d 6f 64 65 2c 30 2c 32 3e

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