NEXIS Video wall Processor

1. Overview

The Video Wall Processor is a high performance video processing workstation with pure hardware architecture for spectacular video wall displaying which can be employed in fields including education and research, government announcement, information publishing, exhibition and show, controlling and commanding center, security monitoring, etc. Advanced image processing technologies such as high definition video signal collecting, real time and high resolution digital image processing ,and advanced three-dimensional digital filtering are integrated in video-wall processor. Moreover, it also employs large-capacity, high-speed FPGA and CrossPoint switch to ensure the real-time processing of all input signal and the consistency of the data, leading to no image delay, discretization, frame loss, which guarantee excellent video displaying.

Video-wall processor is compatible with a wide variety of input signal formats, including ,CVBS,YPbPr, VGA, DVI, Dual-link DVI, HDMI, SDI, twisted pair signal,

optical signal, etc. The output signal of video-wall processor supports DVI-I, twisted pair signal, and optical signal. For DVI-I signal, RGB analogue signal and DVI digital signal can be transmitted concurrently, which means that when video signals displayed on a video-wall, it can also be backup and transmitted to another group of displays simultaneously. The resolution of a single output channel can reaches up to 1920*1200@60Hz. Besides, customers can also upload and display ultra-high resolution static background images with video-wall processor. Additionally, ultra-high resolution dynamic background image is also supported with the extra graphic workstation to achieve perfect displaying.

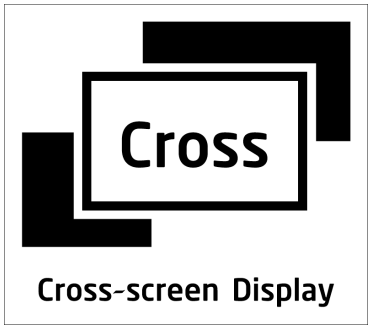
A series models of video-wall processor are available including NW2xxUH, NWxxUH, which differ in features and functions, The largest scale of video-wall processor supports the displays of video wall of 144 screens for maximum. Moreover, video-wall processor also enables different groups of screens displaying at various resolutions, which is very significant to the combination of multi-groups of large screens displaying system.

2. Description

Key Features

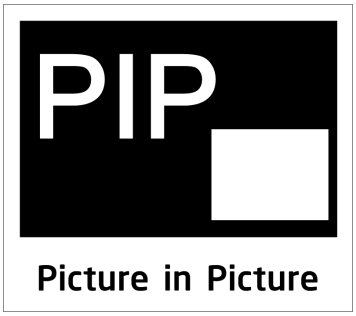
Cross-screen Displaying

Each signal can be displayed in the cross-screen state, which means adjacent screens can jointly display the content of a single signal to form the whole graphics as a “window”. Customers can also zoom the windows drag them to everywhere on the screen-wall.

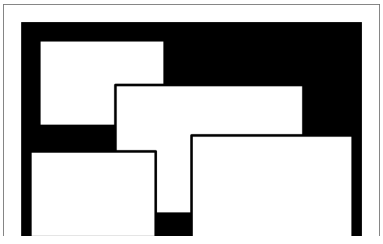


Picture in Picture

A window can be overlaid upon an other windows forming the “picture in picture”. Moreover, the overlaid window is not restricted inside the boundary of the underneath one which offers flexibility to the layout of display.



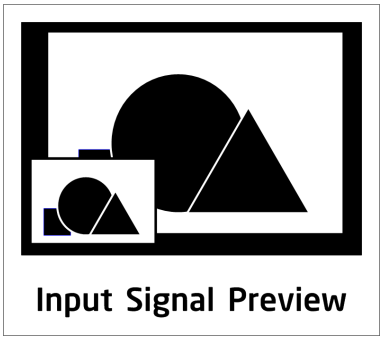
Four Windows per Screen



Video-Wall processor supports maximum four windows in a single screen allows users to view more video signals with limited screens. The layout of the windows can be configured separately which offers flexibility and convenience.

Input Signal Preview

All input signals can be previewed in the UI of software before being displayed on the screens. It enables the operator to detect the input status and display signals correctly.



Other Functions

CrossPoint Switch

Video-Wall processor employs crosspoint switch technology which offers high speed switching and transmission. Comparing to the “bus” switching architecture that all the signals need to share the bandwidth of bus for transmission, crosspoint switch assigns each signal a unique channel to avoid collision,delay, and instability, which contributes to real-time displaying for all video signals.

FPGA architecture

Employing the pure hardware FPGA architecture with self-developed core algorithm provide Video-Wall processor excellent image processing performance. Abandoning embedded operation system preventing Video-Wall Processor from crashes, collisions, blue screen, and viruses which commonly suffered by software architecture. It is highly stable to ensure uninterrupted operation of 7x24, and meet the increasingly strict demand of market.

Card to Main-board Plugging structure

The main modules including input card,output card, switch card control card, cooling fan, and power supply are all designed as plugging structure with the main-board which make it very flexible and convenient for customer to configure the product based on every special demand. It is unnecessary to disassemble the whole device when replacing the module with fault. It also supports the ‘hot-plugging’ for input and output cards which means that customer can plug and pull out the input or output card when the workstation is in process of working. No restarting of refreshing is needed, and other signals will not be affected.

Resolution Real-Time Total Adaptation (RRTA)

Video-Wall processor employs RRTA(Resolution Real-time Total adaptation) technology in order to support customised resolutions for different groups of screens, in other words the resolution for each group of screens can be configured separately in the software which offers flexibility and convenience for daily application and management .

Graphic Cropping and Signal Upscaling

The graphics of all input video signals can be freely cropped to remove the black edge. Moreover, customer can zoom in and out any section of the video graphics after cropping. The upscaling process ensures the zoomed section to be displayed without loss.

Ultra-high Resolution background Image

The built-in storage in Video-Wall Processor allows to store multiple ultra-high resolution static ‘pixel-to-pixel’ background images which can be uploaded, displayed, and switched through the software. With extra graphic workstation, the displaying of ultra-high resolution dynamic background-image can also be achieved to meet specific and professional requirements.

Character Superimposition

Video-Wall processor supports character superimposition to each input signal channel for users to identify the signal source. Users can also customise the font, size, position, and color of the superimposed character.

Scenes Saving, Loading, and Displaying in Loop

Any configuring arrangement of video signal displayed on screen wall can be saved as “scenes”. Video-Wall processor supports up to 32 scenes to be saved and unlimited scenes loaded. Customer can also set the scenes to be loaded and displayed in loop.

HDCP-Compliant

HDMI /DVI input card of Video-Wall processor supports HDCP , which enables HDCP encrypted content to be displayed.

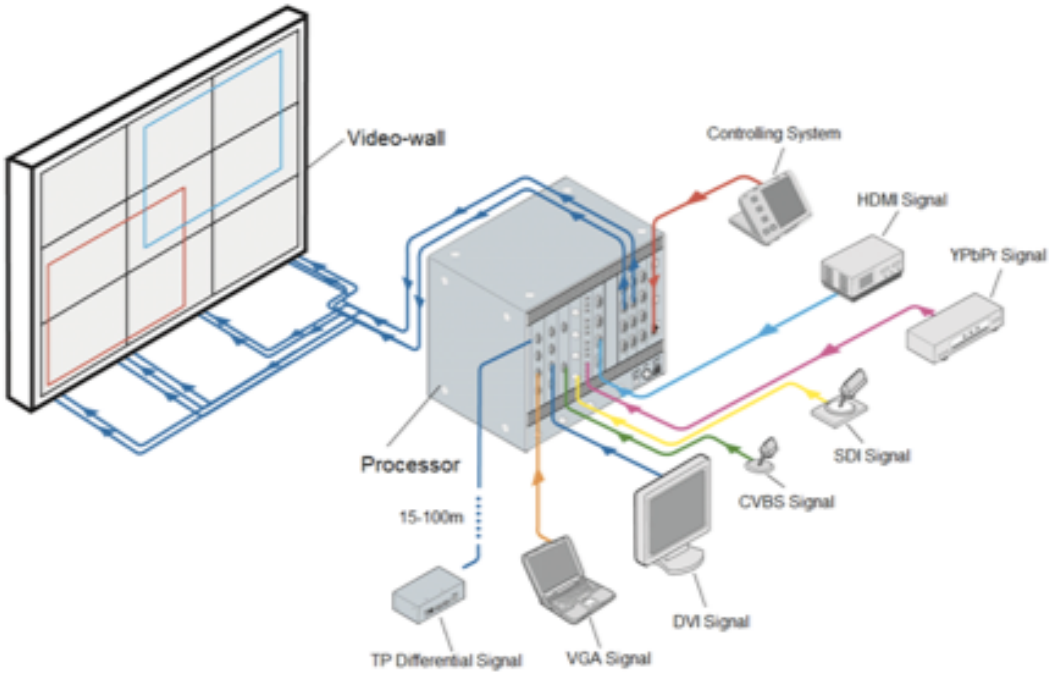
Redundant Power Supply

Video-Wall processor can be configured with dual power supply based on demand. For circumstances if the power source is not stable, the redundant power supply is highly suggested to connected to different power source or self-built UPS. In the condition of stable power source, the device will works on load balancing for each power supply. Once a fault

occurs to the one of the power source, the redundant power supply will start running automatically to ensure un-interruptible operation.

Controlling and Management

The Video-Wall processor controlling software allows users to manage and control the processor on PC. It supports Windows2000/XP/Vista/7/8. The Video-Wall processor and controlling PC can be connected by using CAT5/6 cable(TCP/IP) or RS232 cable. The software can also control up to 4 extra traditional matrix switchers when they are cascade(RS232) to the processor.. The Video-Wall processor can also be controlled by employing the specific controlling keyboard(RS232).



System Diagram of Video-Wall Processor

3. Specifications

3.1 Input card

3.1.1 Input Port - VGA

Signal Format	RGBHV
Maximum Resolution	1920*1200

Signal Format	RGBHV
Color Depth	32bits/pixel
Horizontal Scanning Ration	15KHz-90KHz
Synchronization	Separate sync
Customised EDID	YES
Impedance	75Ω
Reference Level	0.7Vp-p
Physical Port	RGB: 15pins D-sub(DB15/DE-15F)

3.1.2 Input Port - YPbPr

Signal Format	Component EIA-770.2-A
Maximum Resolution	1920*1080
Color Depth	32bits/pixel
Horizontal Scanning Ration	15KHz-90KHz
Synchronization	Separate sync
Customised EDID	YES
Impedance	75Ω
Reference Level	0.7Vp-p
Physical Port	RCA*3

3.1.3 Input Port - DVI

Signal Format	DVI-D digital T.M.D.S. signal in DVI 1.0
Maximum Resolution	1920*1200
Color Depth	32bits/pixel
Signal Level	T.M.D.S 2.9V-3.3V
Customised EDID	YES
Impedance	50Ω
Maximum Data Rate	4.95Gbps
Physical Port	24+5 pins/DVI-I

3.1.4 Input Port - CVBS

Standard	PAL/NTSC
Resolution	480i/576i
Impedance	75Ω
Reference Level	1Vp-p
Physical Port	BNC

3.1.5 Input Port - SDI

Signal Format	HD/3G-SDI
Resolution	720p/1080p
Impedance	75Ω
Maximum Data Rate	3Gbps
Physical Port	BNC

3.1.6 Input Port - HDMI

Standard	HDMI 1.3
Maximum Resolution	1920*1200
HDCP	Yes
Customised EDID	YES
Maximum Data Rate	4.95Gbps
Physical Port	HDMI Type A

3.1.7 Input Port - Dual-link DVI

Signal Format	Dual-link DVI
Maximum Resolution	4K*4K
Impedance	50Ω
Customised EDID	YES
Maximum Data Rate	9.9Gbps
Physical Port	24+5 pins/DVI-I

3.1.8 Input Port - Optical Fibre

Signal Format	Single mode optical signal
Maximum Resolution	1920*1200
Front-end Device	TriF-T1SD or TriF-T1SG
Maximum Transmission Distance	10km
Physical Port	LC

3.2 Output Card

3.2.1 Output Port - DVI/VGA

Signal Format	DVI-I in DVI 1.0 standard
Maximum Resolution	1920*1200
Color Depth	32bits/pixel
Maximum Transmission Distance	25m(DVI)
Physical Port	24+5 pins/DVI-I （Adapter required for VGA output)
Signal Level	T.M.D.S. 2.9V-3.3V
Impedance	50Ω

3.2.2 Output Port - Twisted Pair

Signal Format	Twisted pair differential signal
Maximum Resolution	1920*1200
Color Depth	32bit/pixel
Maximum Transmission Distance	100m
Physical Port	LC

3.2.3 Output Port - SDI

Signal Format	HD-SDI/3G-SDI
Resolution	720p/1080p
Impedance	75Ω

Signal Format	HD-SDI/3G-SDI
Output Backup	Yes
Physical Port	BNC

3.2.4 Output Port - Optical Signal

Signal Format	Single mode optical signal
Maximum Resolution	1920*1200
Rear-end Device	TriF-R1SI
Maximum Transmission Distance	10km
Physical Port	LC

3.3 Models and Scales

Models	Features
NW2xxUH	**Two windows per screen**
NW4xxUH	**Four windows per screen**

Models	Scales	Dimension (mm)	Input		Output
			DVI/VGA/HDMI/SDI/YPbPr/ Optical/Twisted-pair/CVBS	Dual-link DVI /DisplayPort	
NW2xxUH	**2U**	**440/482(W)*380(D)*88.1(H)**	**8**	**4**	**8**
	4U	**440/482(W)*380(D)*175(H)**	**16**	**8**	**16**
	8U	**440/482(W)*380(D)*352.8(H)**	**32**	**16**	**36**
	14U	**440/482(W)*380(D)*619.5(H)**	**64**	**32**	**72**
	20U	**440/482(W)*380(D)*886.2(H)**	**128**	**N/A**	**72**
	28U	**440/482(W)*380(D)*1241.8(H)**	**128**	**36***	**144**

Models	Scales	Dimension (mm)	Input		Output
			DVI/VGA/HDMI/SDI/YPbPr/ Optical/Twisted-pair/CVBS	Dual-link DVI /DisplayPort	
NW4xxUH	4U	440/482(W)*380(D)*175(H)	24	4*	8
	8U	440/482(W)*380(D)*352.8(H)	52	8*	18
	14U	440/482(W)*380(D)*619.5(H)	96	16*	36
	22U	440/482(W)*380(D)*975.1(H)	128	36*	72
	4U	440/482(W)*380(D)*175(H)	16	8	8
	8U	440/482(W)*380(D)*352.8(H)	32	16	18
	14U	440/482(W)*380(D)*619.5(H)	64	32	36
	20U	440/482(W)*380(D)*886.2(H)	128	N/A	36
	28U	440/482(W)*380(D)*1241.8(H)	128	36*	72

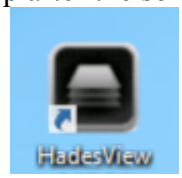
* means dual-link dvi input cards are only effective in specified input slots

4. User Guide

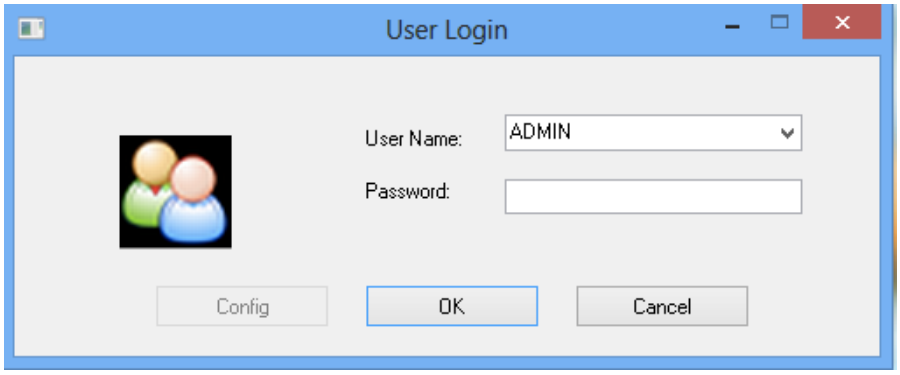
4.1 Operation and Configuration

(1)Operation and connection

Double clicking the icon on desktop after the software has been installed.

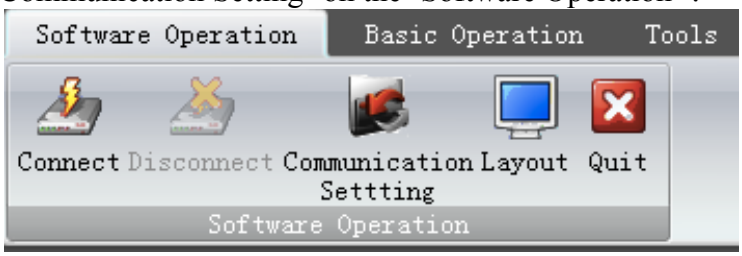


The log in windows will pop up, using the ‘ADMIN’ as user name and left the password blank, then click ‘OK’.

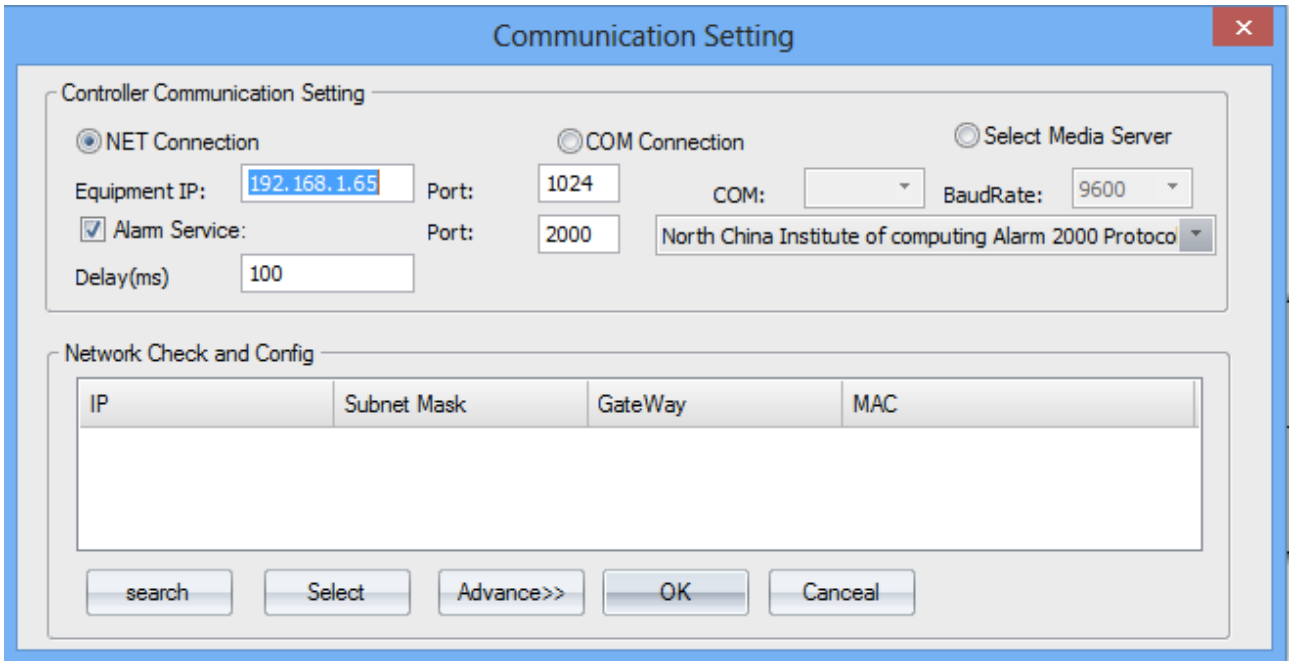


The controlling software menu consists of three modules which are the ‘Software Operation’, ‘Basic Operation’, and ‘Tools’.

Firstly, clicking ‘Communication Setting’ on the ‘Software Operation’ .



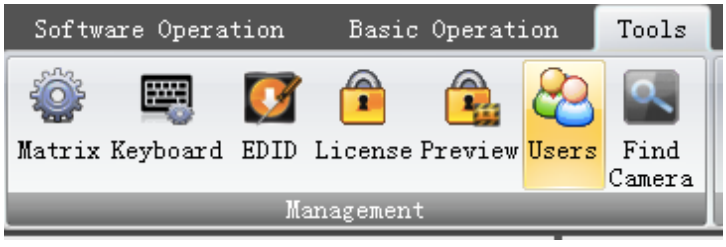
The connection configuration window will pop up. If the ‘NET Connection’ has been chose, the default IP address and port number of the processor are ‘192.168.1.65’ and ‘1024’. If the ‘COM Connection’ has been chose, select the correct COM port, and make sure the baud rate is 9600. Then clicking OK to save the settings.



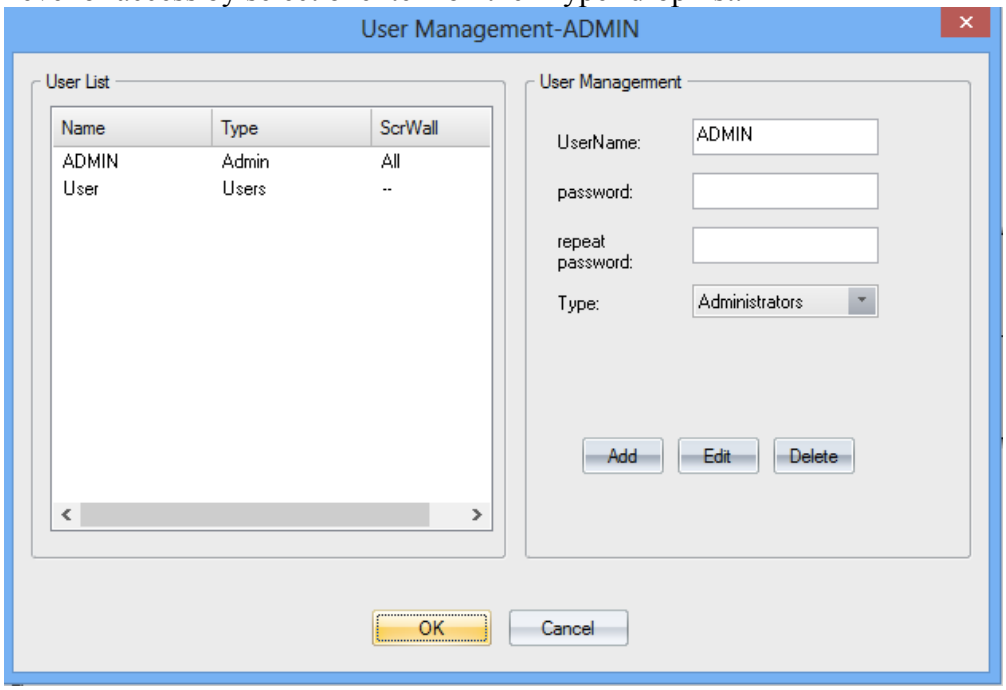
After that, clicking ‘Connect’ to connect the processor.

(2)User Administration

Clicking ‘Users’ on the ‘Tools” menu



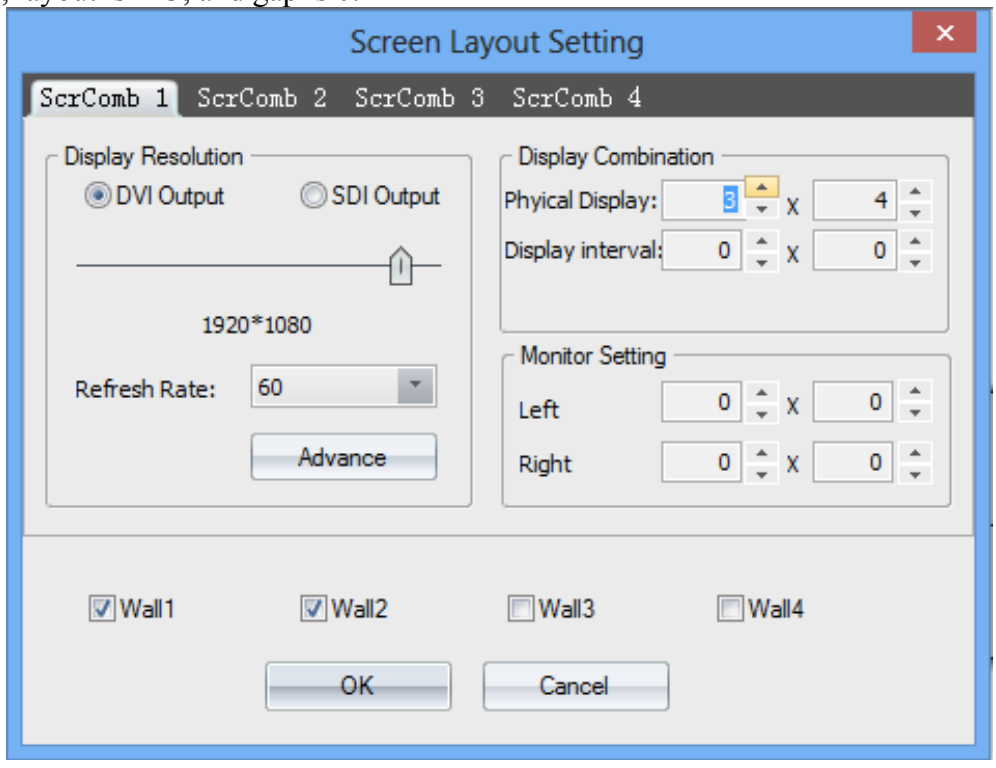
On the pop-up window, the username, password for users to log-in can be configurated. You can also set the level of access by select one item on the ‘Type’ drop list.



(3) Video-wall settings

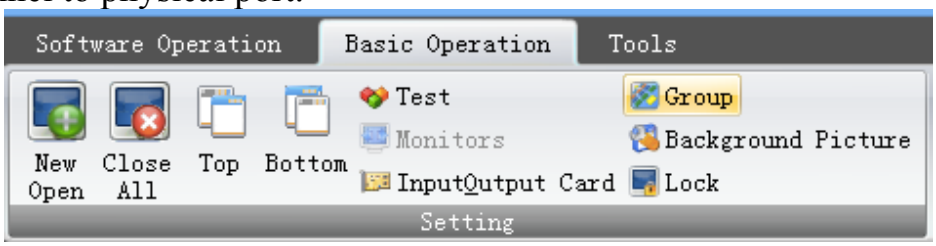
Clicking ‘Layout’ on the ‘Software Operation’ to set the video-wall. users can set the output resolution, layout, and the gap between displays for up to 4 groups of video-wall.

For example, the figure below shows the setting of video-wall 1 which the output resolution is 1920*1080, layout is 2*3, and gap is 0.



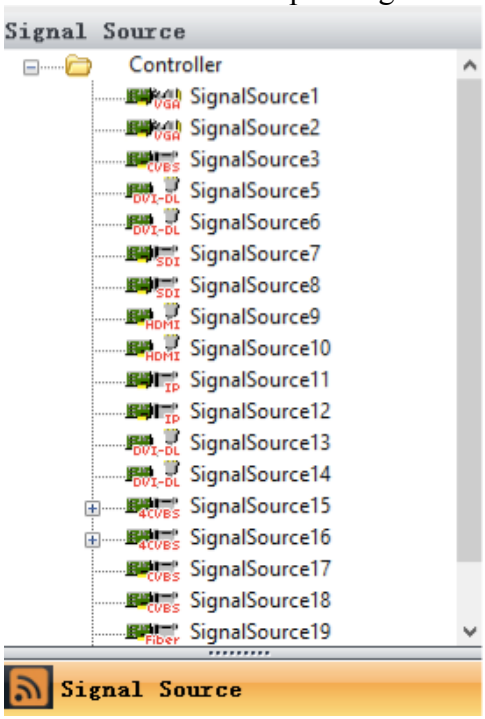
(4) Channel Mapping

Clicking the ‘group’ on the ‘Basic Operation’ menu to set the output mapping from logical channel to physical port.

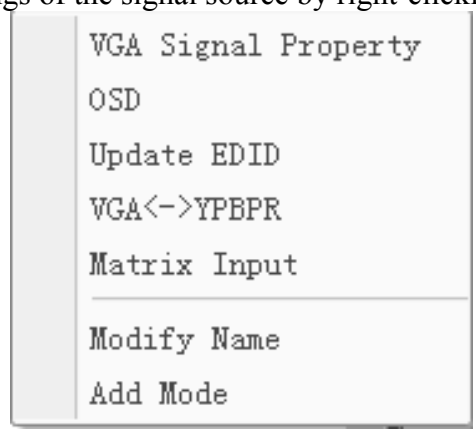


(5) Signal Source Setting

The signal source list located on the left of the software UI. The icon of each signal source will turns green if input signal has been detected on corresponding channel.

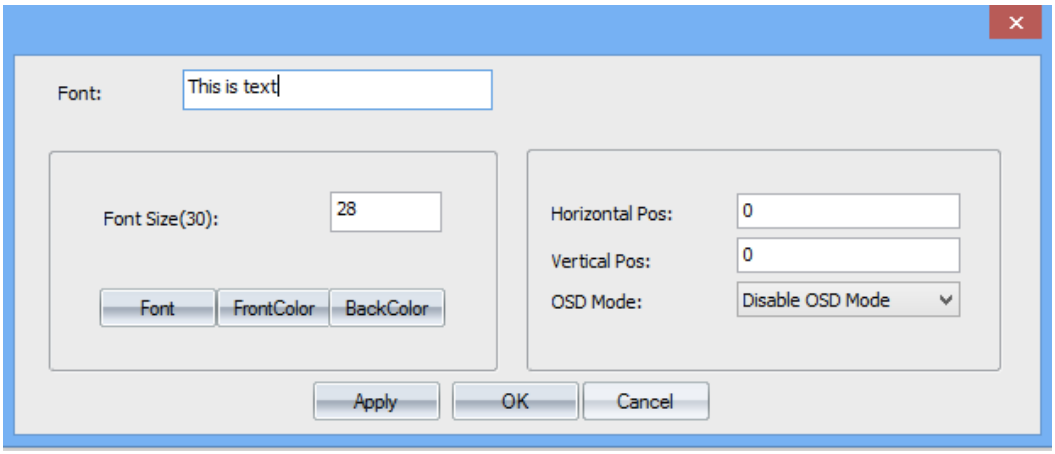


Users can configurate the settings of the signal source by right-clicking one of them.

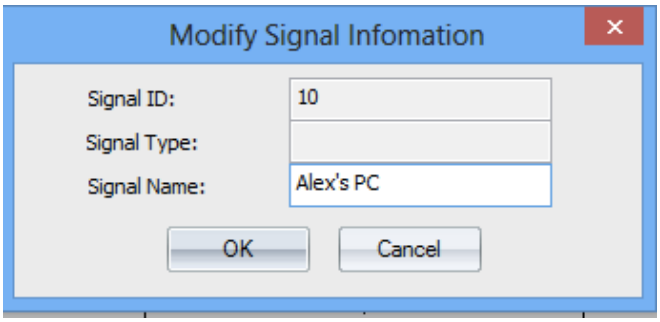


OSD:
OSD is for character superimposition, user can enter the text which need to be displayed overlaying the video on the textfield. The position of the text overlaying on the video can also be defined by setting values for ‘Horizontal Pos’ and ‘Vertical Pos’. There are three modes of OSD can be chose:

Disable OSD Mode: No character superimposition
OSD Mode 1: Character superimposition with transparent background
OSD Mode 2: Character superimposition with pure colour background

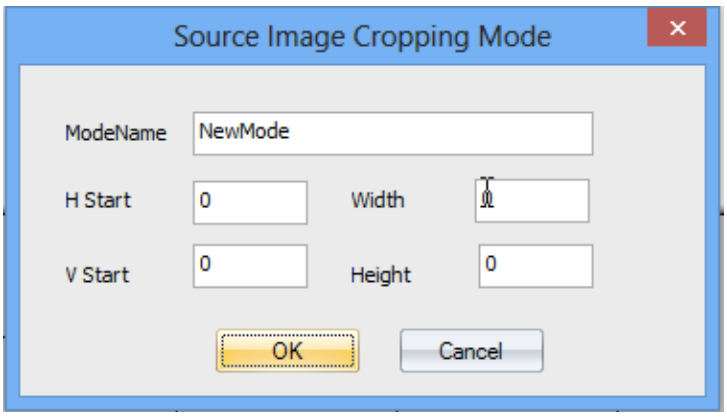


Modify name:
The name of the signal source can be specified by ‘Modify name’, it will helps to identify and mange the signal sources.



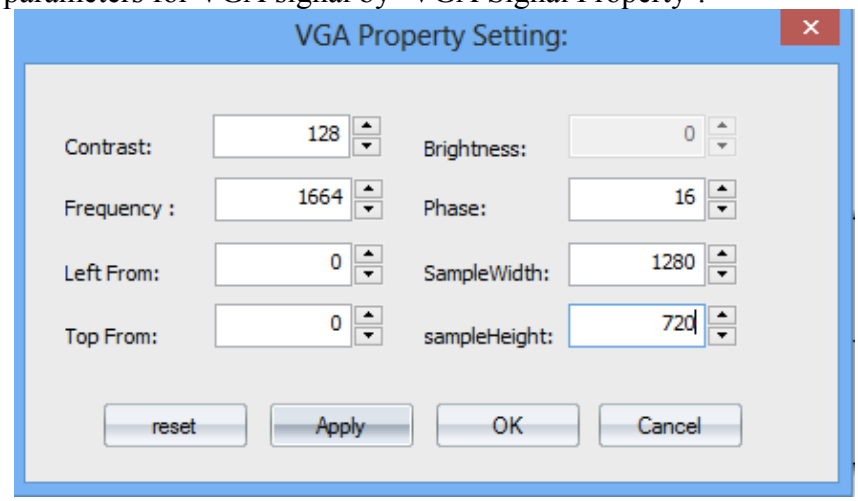
Add mode:
Users can cropping the input video signal by ‘Add Mode’. The parameters are:

H Start: The horizontal starting pixel of the cropped signal
V Start: The vertical starting pixel of the cropped signal
Width: The width of the cropped video signal
Height: The Height of the cropped video signal



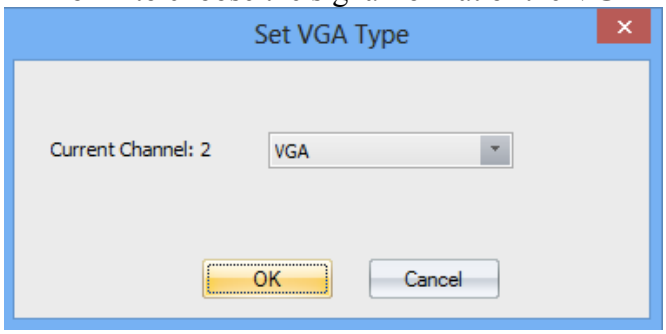
VGA Signal Property

User can set the parameters for VGA signal by ‘VGA Signal Property’.



VGA <---> YPbPr

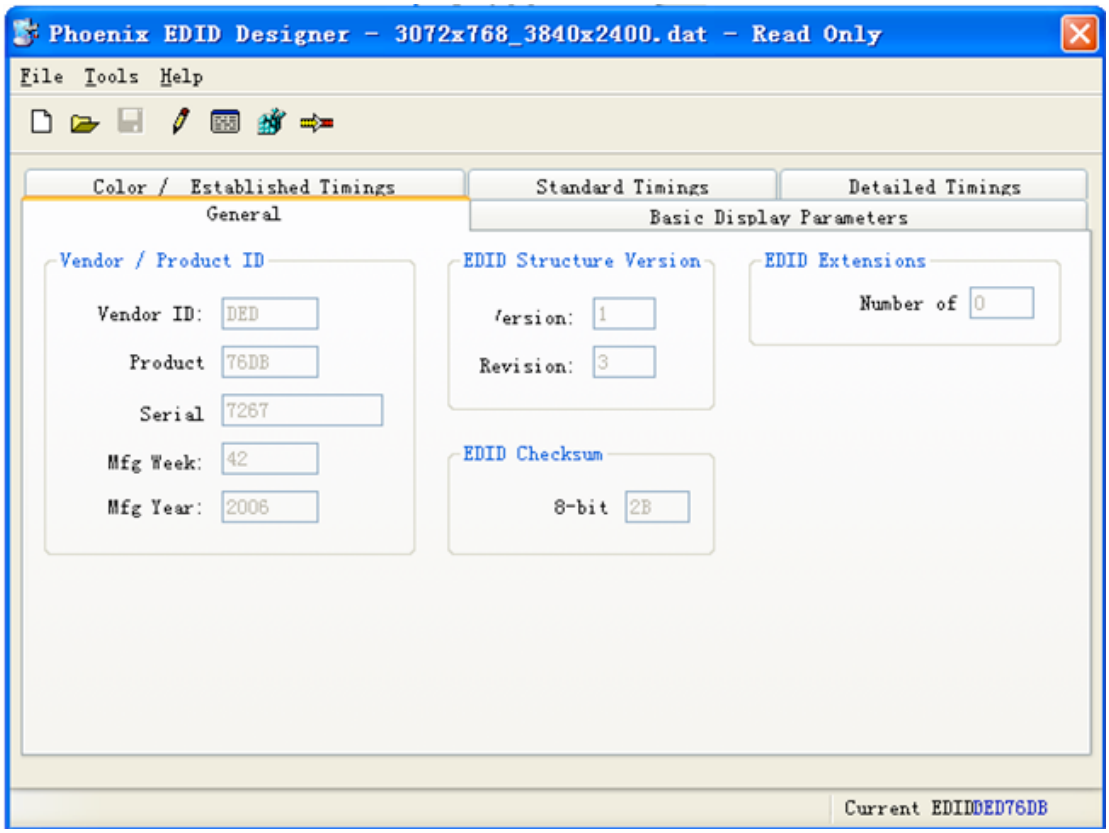
Selecting the ‘VGA <---> YPbPr’ to choose the signal format of the VGA input channel.



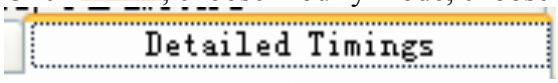
Update EDID

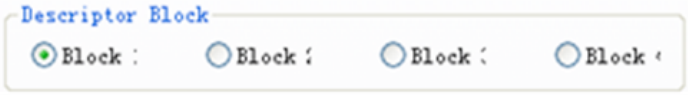
Users can configurate the EDID of the input port for abnormal resolution. Clicking ‘EDID’ on the ‘Tools’ menu

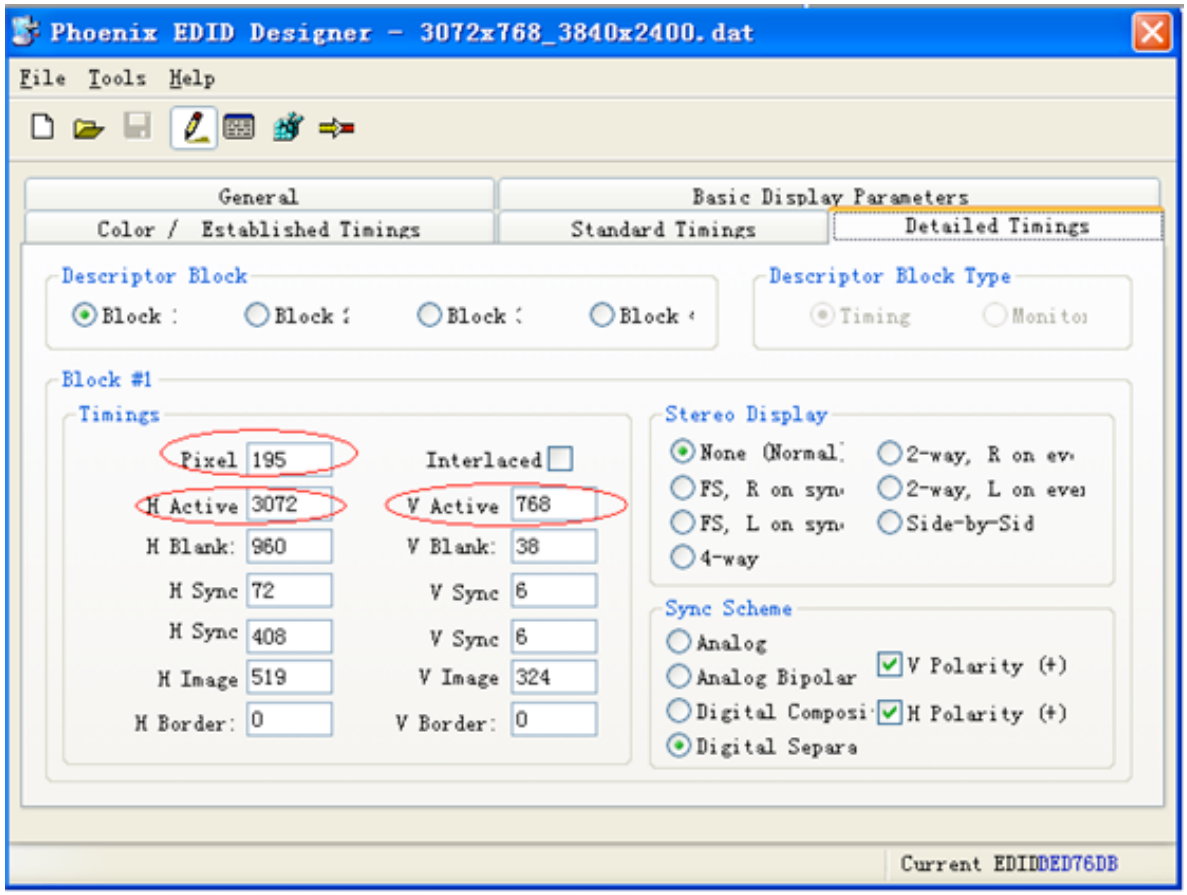
Click ‘File ---> Open EDID’ to open one current EDID configuration file(.dat), then modify it to create an new file.



Click  , choose modify mode, choose the first block on ‘Detailed Timings’ menu,





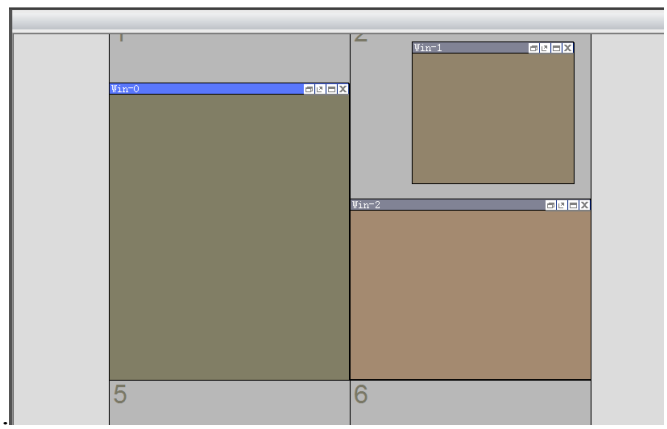


H Active: the horizontal pixels
V Active: the vertical pixels
Pixel: the refresh rate (Recommended not to modify)

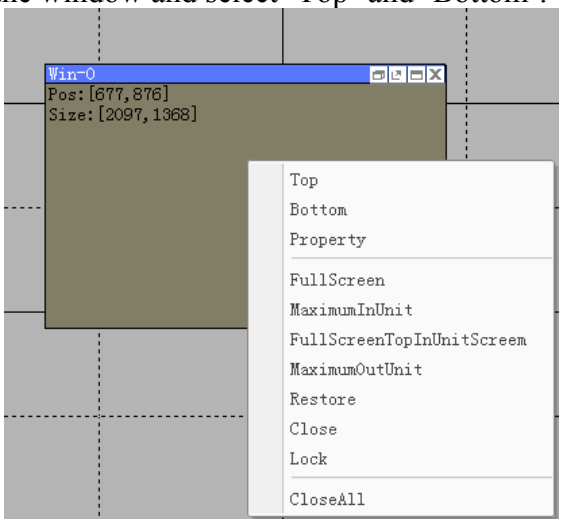
When finish configuration, don't replace the previous file, save as an new file and save it one the PC. Then right clicking the signal source and click 'Update EDID', choose the created file.

(6) Window Controlling

Select one signal source by clicking the icon, then customise a rectangular zone by mouse dragged with its left button to select a region on the the grey area in UI corresponding to the video-wall, after that a windows will be created for displaying on the video-wall. Windows can also be created by click 'New Open' on the'Basic Operation' menu. Users can customise the size and the position of the windows anywhere within the video-wall

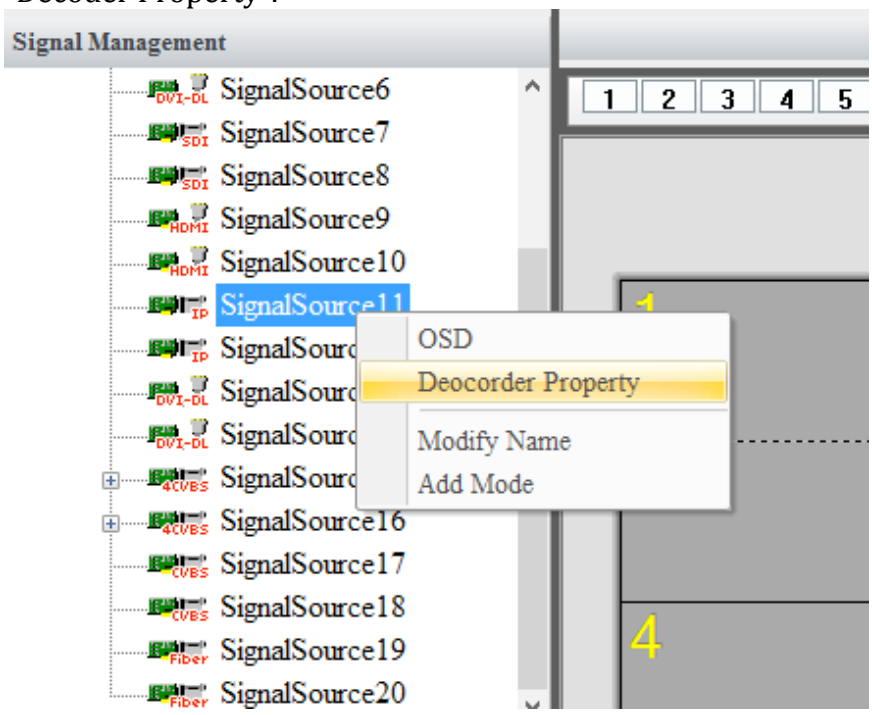


The processor supports the maximum of 4 windows on a single display. The layer of the windows can be set by right clicking the window and select ‘Top’ and ‘Bottom’.

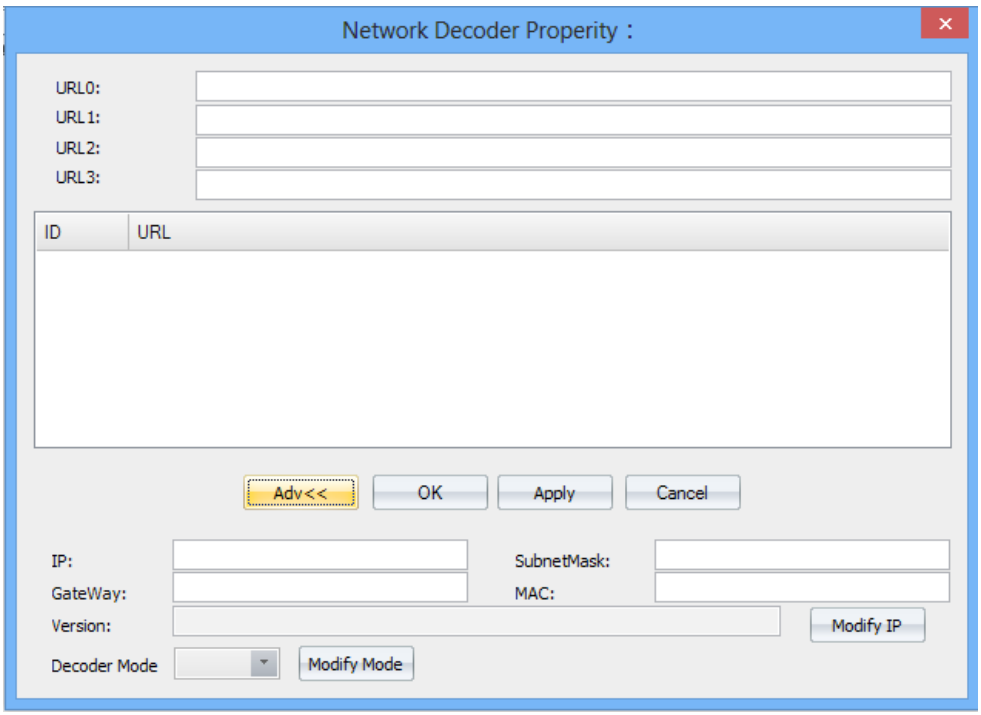


(7) IP Card Setting

1. Right clicking the IP signal source on the “Signal Management” list, and choose the “Decoder Property”.



2. Enter the RTSP address of the IP camera or PC with RVC (need to contact the manufacture of the camera).
   For example: the RTSP of one sample IP camera is:
   rtsp:// 192.168.1.108:554 (This address differs according to the Cameras)



3. Click “Adv” , and set the network parameters of the IP decoding card. The decoder should be in the same network with the camera.

   For Example, the properties of the IP camera is:

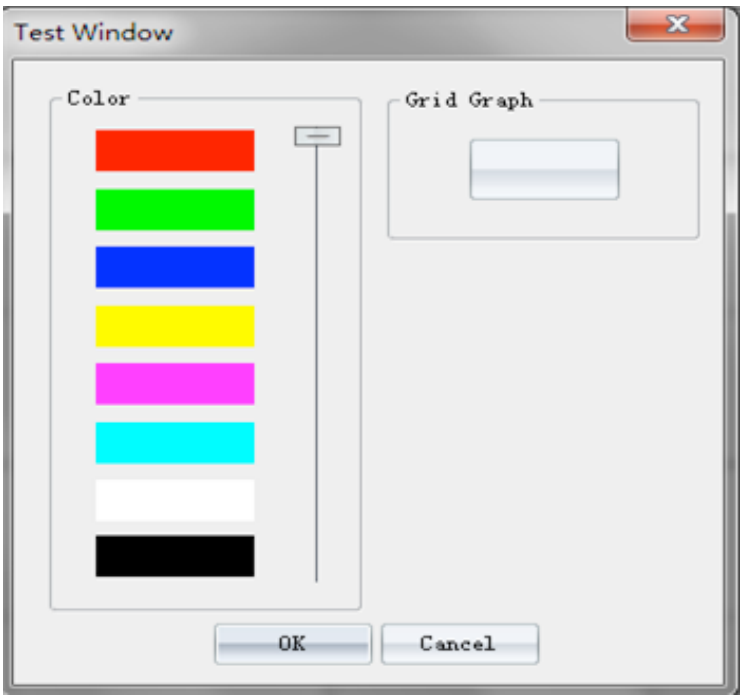
   IP: 192.168.1.108
   Subnet Mask: 255.255.255.0
   Gateway: 192.168.1.1

   The parameters of the decoder can be set as:
   IP: 192.168.1.10 (Any address in 192.168.1.2---192.168.1.255 which has not been taken)
   Subnet Mask: 255.255.255.0
   Gateway: 192.168.1.1

4. Then Create windows with this IP source just same as other traditional sources.

(8) Test Signal

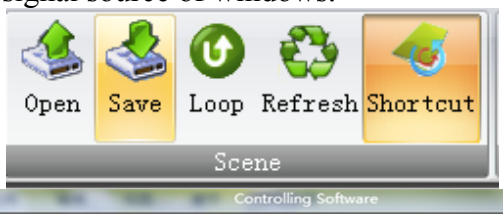
Users can test the connection between processor and displays by transmitting the signals of pure colour or grid to the displays.

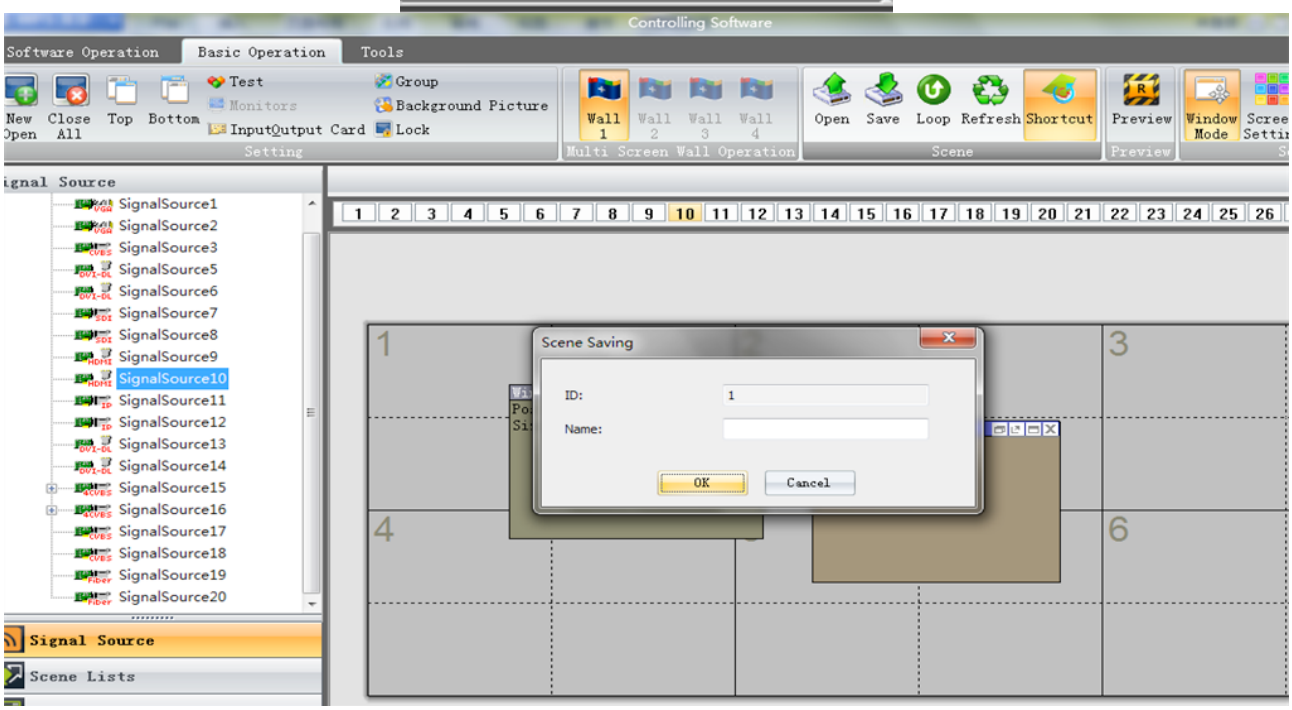


(8) Scene

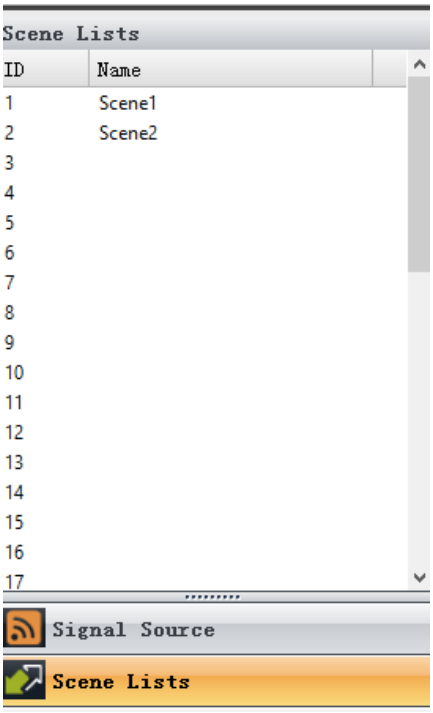
Saving and Loading

Clicking the ‘Save’ on the ‘Basic Operation’ to save the displaying status of the video-wall including the layout, size, and signal source of windows.

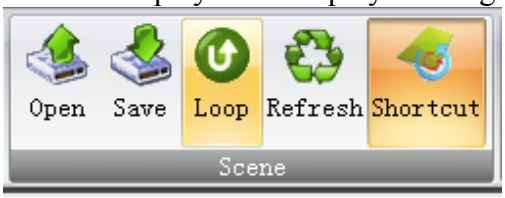




Users can load the ‘scenes’ by select one scene on the ‘Scene List’ which located on the left side of the software UI.



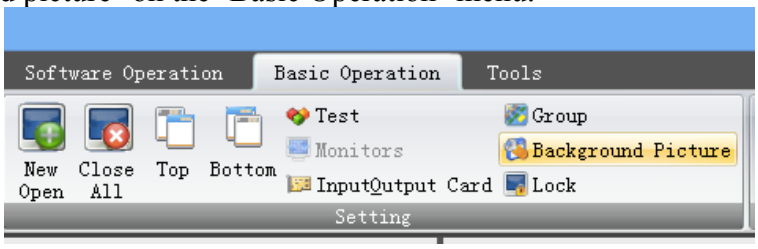
All the saved scenes can be loaded and displayed on loop by clicking ‘Loop’ on ‘Basic Operation’



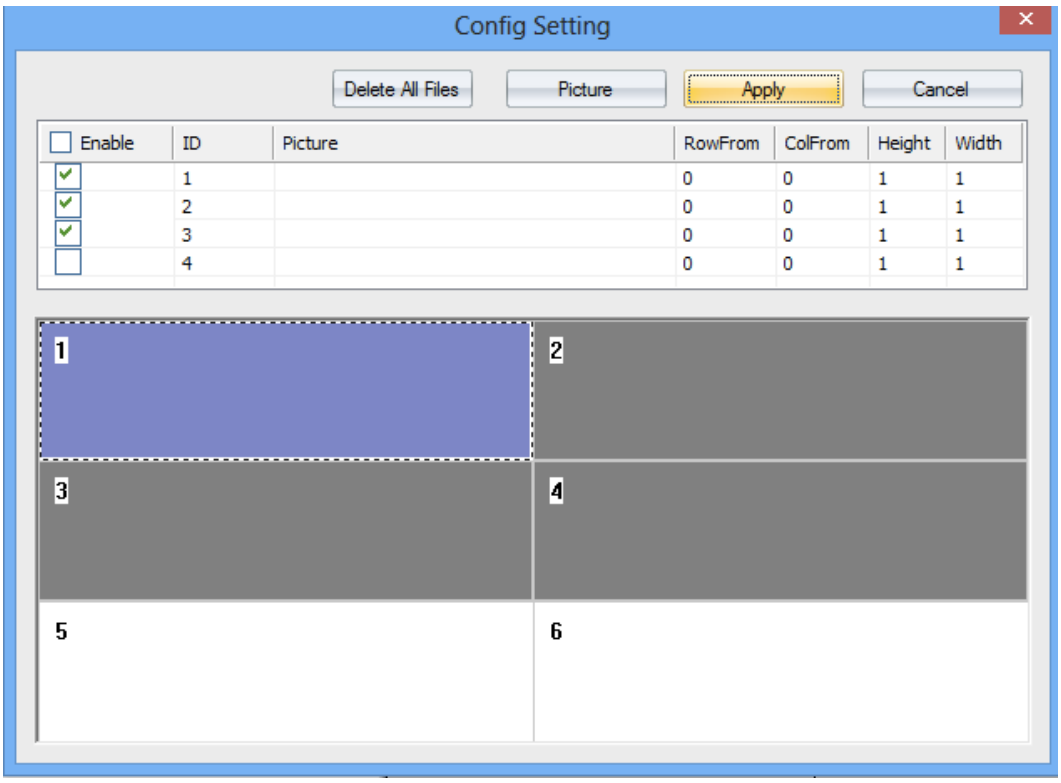
(9)Advanced settings

Background image

H-Series supports users to upload and display high definition background image by clicking ‘Background picture’ on the ‘Basic Operation’ menu.



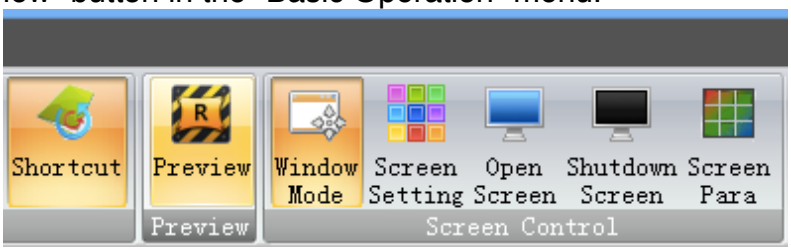
Click ‘picture’ to add background image files (.bmp) to the processor. Then choose the uploaded image and the video-wall which used to displaying this image. The image can be displayed full screen or on specified area on video-wall by select the displays.



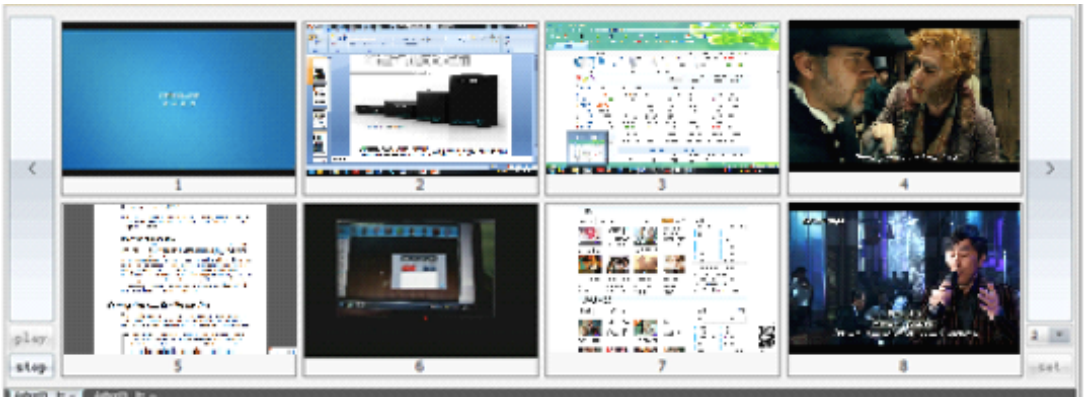
Input Signal Preview

Connecting the controlling PC, the controlling ethernet port, and the ethernet port on the preview card to the same LAN.

Clicking the “Preview” button in the “Basic Operation” menu.



The preview region is shown on the bottom of the software UI. User can preview the input signal by clicking the “play” button. The input signal can be previewed in a larger window by double clicking it.



5. Instruction set

1. Set the layout of video-wall

Instruction Format	<wmod, *screen_id, hnum, vnum, hgap, vgap*>	
Function	To set the screens' layout of the video-wall	
Parameters	*Screen_ID*	The video-wall ID (0 indicates video-wall 1, 1 indicates video-wall 2, 2 indicates video-wall 3, 3 indicates video-wall 4,)
	hnum	The amount of displays in a row
	vnum	The amount of displays in a column
	hgap	The gap between horizontal adjacent displays
	vgap	The gap between vertical adjacent displays

【Example】<wmod,0,3,2,15,15>
Indicates the video-wall 1 is combined in a 3*2 layout, the horizontal and vertical gaps between adjacent displays are both 15 pixels.

2. Set the display resolution

Instruction Format	<sset, *Screen_ID, total_line, total_pix, act_vpos, act_vsize, act_hpos, act_hsize, hs_width, vs_width, dis_freq_h, dis_freq_l, hsync_pol, vsync_pol*>	
Function	To set the output resolution to one single display on the video-wall	
Parameters	*Screen_ID*	The video-wall ID
	Total_line	Total lines of one frame
	Total_pix	Total pixel clocking of one line
	Act_vpos	The vertical starting point of the active line
	Act_vsize	Total number of active lines of one frame
	Act_hpos	The horizontal starting point of the active pixel
	Act_hsize	Total number of active pixel of one line
	Hs_width	Width of horizontal synchronization
	Vs_width	Height of vertical synchronization
	Dis_freq_h	the integer part of pixel clock frequency
	Dis_freq_l	the fractional part of pixel clock frequency
	Hsync_pol	The polarity of horizontal polarity
	Vsync_pol	The polarity of vertical polarity

【Examples】

1.<sset,0,806,1344,35,768,296,1024,136,6,65,0,1,1> //1024x768
2.<sset,0,1066,1688,41,1024,360,1280,112,3,108,0,0,0> //1280x1024
3.<sset,0,795,1792,24,768,368,1360,112,3,85,32768,0,0> //1360x768
4.<sset,0,1089,1864,36,1050,378,1400,144,4,121,49152,0,0> //1400x1050
5.<sset,0,934,1904,31,900,384,1440,152,6,106,46622,0,0> //1440x900
6.<sset,0,1250,2160,48,1200,496,1600,192,3,162,0,0,0> //1600x1200
7.<sset,0,1089,2240,35,1050,456,1680,176,6,146,0,0,0> //1680x1050
8.<sset,0,1125,2200,41,1080,192,1920,44,5,148,32768,0,0> //1920x1080
9.<sset,0,1235,2080,31,1200,118,1920,32,6,154,0,0,0> //1920x1200
10.<sset,0,750,1650,25,720,260,1280,40,5,74,16384,0,0> //1280x720

3. Creating a window

Instruction format	<open, *Screen_ID, W_ID, SourceCh, src_hstart, src_hsize, src_vstart, src_vsize, x0,.y0, x1,y1*>	
Function	To create a new window of the specified video-wall	
Parameters	*Screen_ID*	The video-wall ID
	W_ID	The ID of the window to be created
	SourceCh	The input channel which used as the signal source of the window
	src_hstart	The horizontal starting pixel of the signal source
	src_hsize	The horizontal ending pixel of the signal source . If the value is 0, means the original horizontal size of the signal source, and the *src_hstart i*s useless
	src_vstart	The vertical starting pixel of the signal source
	src_vsize	The vertical ending pixel of the signal source . If the value is 0, means the original vertical size of the signal source, and the *src_vstart i*s useless
	x0	The horizontal starting pixel of the window on video-wall
	y0	The horizontal ending pixel of the window on video-wall
	x1	The vertical starting pixel of the window on video-wall
	y1	The vertical ending pixel of the window on video-wall
Returning Value	WIN_ID_ERR	The window ID has already been taken
	NET_OK	Succeed

【Example 1】<open, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1365, 767>

To create a window with ID 0 on video-wall 2, the input channel 1 is used as signal source, and no cropping has been processed.

【Example2】<open,0,1,2, 0,512,0,512, 0,0,1365,767>

To create a window with ID 1 on video-wall 1, the input channel 2 is used as signal source, and crops the 512*512 section of the left-top corner to displaying on window.

4. Moving the window

Instruction Format	<move, *W_ID, SourceCh, src_hstart, src_hsize, src_vstart, src_vsize, x0, y0, x1, y1*>	
Function	To move the window to a specified position	
Parameters	See at instruction 3	

5. Switching the signal source of window

Instruction Format	<icha, *w_id, SourceCh, src_hstart, src_hsize, src_vstart, src_vsize*>	
Function	To switch the signal source of a specified window	
Parameters	*w_id*	window ID
	SourceCh	source channel ID
	src_hstart	The horizontal starting pixel of the signal source
	src_hsize	The horizontal ending pixel of the signal source . If the value is 0, means the original horizontal size of the signal source, and the *src_hstart i*s useless
	src_vstart	The vertical starting pixel of the signal source
	src_vsize	The vertical ending pixel of the signal source . If the value is 0, means the original vertical size of the signal source, and the *src_vstart i*s useless

【Example】<icha, 1, 3, 0, 0, 0, 0>

To switch the input channel 3 to window 1 as signal source, and no cropping has been processed.

6. Saving the scenes

Instruction Format	<save, *Scene_id, Wall_id*>	
Function	To save the current displaying status of the specified video-wall	
Parameters	*Scene_id*	The scene ID (0-39) to save the displaying status(0-22 for 22U and above)
	Wall_id	Video-wall ID

Returning Values	Scene_id_error	This scene id exceed the range
	OK	Succeed

【Example】<save,2,2>
To save the current displaying status of video-wall 3 to scene 3

7. Loading the scenes

Instruction Format	<call, *Scene_id, Wall_id*>	
Function	To load a saved scene on the specified video-wall	
Parameters	*Scene_id*	The scene ID (0-39) which need to be loaded(0-22 for 22U and above)
	Wall_id	The screen wall ID
Returning Values	Scene_id_error	This scene id exceed the range
	No Scene	This scene does not exist.
	OK	Succeed

【Example】<call, 5,1>
To load the 6th scene of video-wall 2

8. Setting to top/bottom of the window

Instruction Formant	<Torb, *W_ID, Z*>	
Function	To set the window to top/bottom	
Parameters	*W_ID*	Window ID
	Z	0: Set to top 1: Set to bottom

【Example】<Torb,1,0>
To set the window 1 to top.

9. Closing all windows

Instruction Format	<rset, *Screen_ID*>
Function	To close all windows on a video-wall

Parameters	*Screen_ID*	The ID of video-wall on which all the windows need to be closed

【Examples】<rset, 0>
To close all windows of video-wall 1

10. Closing the window

Instruction Format	<shut, *W_ID*>	
Function	To close the specified window	
Parameters	*W_ID*	The window ID which need to be closed

【Example】<shut, 3>
To close the specified window.

11. Reading the input channel parameters

Instruction Format	<rcpm, *SourceChl*>	
Function	To read the parameter of specified input channel	
Parameters	*SourceChl*	Input channel ID
Parameters	contrast	
	brightness	
	freq	Sampling frequency
	phase	
	de_left,	Left side starting point
	de_right	Right side ending point
	de_top	Top starting point
	de_bottom	Bottom Ending point

【Example】<rcpm, 4>
To read the parameters of input channel 4

12. Modifying the input channel parameters

Instruction Format	<wcpm, *SourceChl, contrast, brightness, freq, phase, de_left, de_right, de_top, de_bottom*>	
Function	To modify the input channel parameters	
Parameters	*SourceChl*	The input channel, begins from 1.
	contrast	
	brightness	
	freq	Sampling frequency
	phase	
	de_left,	Left side starting point
	de_right	Right side ending point
	de_top	Top starting point
	de_bottom	Bottom Ending point

【example】<wcpm, 4, 128, 128, 1904, 0014, 0384, 1824, 0031, 0931>
To modify the parameters of input channel 4, contrast is 128, brightness is 128, sampling frequency is 1904, left starting point is 0014, right ending points is 1824, top starting point is 0031, and bottom ending point is 0931.

13. Factory reset of VGA input channel

Instruction Format	<scpm, *SourceChl*>	
Function	Factory reset the VGA input channel	
Parameters	*SourceChl*	The input channel, begins from 1.

【Example】<scpm, 4>
To facotory set the input channel 4

14. Setting the output displaying mode

Instruction	<tmod, *Screen_ID, Mode, grid, R, G, B*>	
Function	To set the output displaying mode among normal mode, grid mode, and color test mode.	
Parameters	*Screen_ID*	The video-wall ID
	Mode	0: normal displaying mode 1:grid mode 2: pure colour mode
	Grid	The spacing between adjacent lines in grid mode
	R, G, B	The RGB color space value of the pure colour mode

15. Enabling the video-wall

Instruction Format	<sena, *Screen_id, Screen_en*>	
Function	Enabling or disabling the video-wall	
Parameters	*Screen_ID*	The video-wall ID
	Screen_en	1: video-wall enabling 0: video-wall disabling

【Example】<sena,1,1>
Enabling the video-wall 2.

16. Inquiring the information of video-wall

Instruction Format	<winf, *Screen_ID*>	
Function	Inquiring the information of video-wall	
Parameters	*Screen_ID*	The video-wall iD
Returning Value	For example, sending <winf, 0>, the returning could be: <The valid window ID is : 0, hnum is 2 vnum is 2 hgap is 0 vgap is 0 hsize is 1280 vsize is 1024 backgroud_pic_en is 1 backgroud_pic_addr is 3072 backgroud_pic_hsize is 1920 backgroud_pic_vsize is 1200 backgroud_pic_hpos is 0 backgroud_pic_vpos is 0 backgroud_pic_hnum is 4 backgroud_pic_vnum is 2 screen_en is 1 The current out_table for 0 is : 0 : 1,1 : 2,2 : 3,3 : 4,>	

17. Inquiring current input status

Instruction Format	<vinf>
Function	To inquire all the input information of the device

Returning Value	The valid Input is : SRC TYPE SIGNAL 01 VGA 1 02 VGA 0 03 VGA 1 04 VGA 1 Note: SRC is the input channel number, signal = 1 means the signal is detected, signal=0 means no signal detected.

18. Inquiring the window information

Instruction Format	<widf, *W_ID*>	
Function	To inquire the specified window information, including the cropping status of the input source	
Parameters	*W_ID*	window ID
Returning Values	source	Input source number
	hstart	Horizontal starting pixel
	hend	Horizontal ending pixel
	vstart	Vertical starting pixel
	vend	Vertical ending pixel

19. Setting the synchronization mode

Instruction Format	<smod, *Screen_id, sync_mode*>	
Function	To set the synchronization mode of video-wall	
Parameters	*Screen_ID*	The video-wall ID
	Sync_mode	0:async mode 1: sync mode

20. Setting the output channel mapping

Instruction Format	<ocov, *Screen_id, Logic_ch, Phy_ch*>	
Function	To set the channel mapping of output connection port	
Parameters	*Screen_id*	The video-wall ID
	Logic_ch	The logical output channel, corresponding to the layout of screen-wall, the channel number(begins from 0) increases from left to right, then top to bottom.
	Phy_ch	The physical port on the device

21. Inquiring the IP address information of device

Instruction Format	<QIPR>
Function	To inquire the ip address of device

22. Modifying the network parameters of device

Instruction Format	<mipr, *ip[4], mac[6], mask[4], gar[4], port[2]*>	
Function	To modify the network parameters of the device	
Parameters	ip[4]	IP address (4 decimal number)
	mac[6]	MAC address (6 decimal number)
	mask[4]	Subnet mask (4 decimal number)
	gar[4]	Gateway (4 decimal number)
	port[2]	Port number (2 port)
Notice	A. The format of MAC address should be convert into the decimal format B. This instruction only supports to be used via ethernet connection.	

【Example】<mipr,192,168,1,65,0,8,14,0,16,8,255,255,255,0,192,168,1,1,1024,1025>
To set the ip as 192.168.1.65, mac address as 00-08-0E-00-10-08, subnet mask as 255.255.255.0, gateway as 192.168.1.1, port number as 1024 and 1025 (only the first one is used).

23. Setting character superimposition

Instruction Format	<font, *SourceChl, hstart, vstart, Mode, front_color_R, front_color_G, front_color_B, back_color_R, back_color_G, back_color_B*>	
Function	To set character superimposition of the specified input channel	
Parameters	*SourceChl*	The ID of input channel to set character superimposition
	hstart	The horizontal starting point of the character zone
	vstart	The vertical starting point of the character zone
	Mode	The mode of character superimposition, the last bit is 0 means no superimposition , the last 2 bits is 01 means the character is front color and background is the original image, the last 2 bit is 11 means character is the front color and the background is the background color.
	Front_color	Front color
	Back_color	Background color
Note	The size of character zone is fixed to 512*32. The buffer of character zone is 2028 byte, each bit represents one pixel, totally 512*32 pixel	

24. Setting the date and time of device

Instruction Format	<tset, *Second, Minute, Hour, Day, Date, Month, Year, Century*>	
Function	To set the time and date	
parameters	*Second*	
	Minute	
	Hour	
	Day	1 for Monday, 2 for Tuesday..., 6 for Saturday, 7 for Sunday
	Date	
	Month	
	Year	The last two digits of the year
	Century	The first two digits of the year

【Example】<tset, 56, 12, 16, 5, 21, 11, 11, 20>
Set the time and date to16:12:56, Fri, 2011.11.21,

25. Returning the time of device

Instruction Format	<trea>
Function	Returns the time of the device.

【Example】<trea>
<Year : 2012
month : 2
date: 14
day: 2
hour: 17
minute: 44
second: 35>

26. Setting the background image enabling

Instruction Format	<bken, *Screen_id, Bk_en, Flash_base, Pic_hsize, Pic_vsize*>

Function	To set the enabling of the background image and the displaying range of the background image	
Parameters	*Screen_id*	The video-wall number
	Bk_en	0:Disabling background image 1:Enabling background image
	Flash_base	The storage 'page' address of background image on flash, one page is 2048 byte.
	Pic_hsize	The horizontal width of the background image
	Pic_vsize	The vertical height of the background image

27. Setting the format of input signal

Instruction Format	<imod, *In_ch, Mode*>	
Function	To set the format of input signal(apply to VGA/YPbPr input card)	
Parameters	*In_ch*	Input channel number
	Mode	Value equals to '0' indicates VGA signal input, value equals to '1' or '2' indicates YPbPr signal input.

6. Installation Instruction

6.1 Open the Package

Check the device and accessories,including the device、Power cable、ethernet Cable Port line、manual、Warranty card、CD.

6.2 Install the device

Insert the power cable to the chassis rear power interface, identifying apparatus according to the rear, access signal.Connect the output device according to the output signs, the number order is from left to right and from top to bottom.

6.3 Device adjust

Turn on the power switch, turn on the power supply.

Install the related operating disc software, and operate according to the manual of the software.

7. Trouble shooting

7.1 Cannot install the software

Reason	Missing VC++ runtime library
Solution	For 32 bits system, please install vcredist_x86.exe
	For 64 bits system, please install vcredist_x64.exe

7.2 No image on the displays

Reason	No signal inputting
	Damaged output cable or exceed the transmitting distance
Solution	Please check the input signal
	Make sure the output and input port connected to the correct devices
	Replacing the cables with high quality video cables

7.3 Color cast on image

Reason	The cable is not well connected
	The signal cable damaged
	Incorrect color adjustment of the equipment
	The color tune of the using software is incorrect
Solution	After the connecting the port, please tighten the screw and prevent the movement caused by pulling
	Please replace with a good quality VGA line
	Adjust the color balance of the display equipment by referring to the manuals of the display equipment
	Re-adjust the color tune by controlling software

7.4 Shaking or noisy point on image

Reason	Long cable causes serious signal attenuation
	The signal source is unstable or damaged cables

Reason	Long cable causes serious signal attenuation
	The signal source is unstable or damaged cables
Solution	Recommended to use the cable driver by our company.
	Adjust the input signal can using cable with high quality

7.5 Dark edge on the display

Reason	Video signal has been cropped by the display
	Inappropriate adjustment to the video on the controlling software
Solution	Adjust to the default setting in the software according to the equipment instructions
	Re-adjust the picture location by the controlling software to get the expected effects.