UltraVista Pro

Video Wall Image Processor

ROSE.COM

Installation
and
Operation Manual

ROSE ELECTRONICS

10707 Stancliff Road
Houston, Texas 77099

Phone: (281) 933-7673
tech-support@rose.com

LIMITED WARRANTY

Rose Electronics warrants the UltraVista Pro to be in good working order for one year from the date of purchase from Rose Electronics or an authorized dealer. Should this product fail to be in good working order at any time during this one-year warranty period, Rose Electronics will, at its option, repair or replace the Unit as set forth below. Repair parts and replacement units will be either reconditioned or new. All replaced parts become the property of Rose Electronics. This limited warranty does not include service to repair damage to the Unit resulting from accident, disaster, abuse, or unauthorized modification of the Unit, including static discharge and power surges.

Limited Warranty service may be obtained by delivering this unit during the one-year warranty period to Rose Electronics or an authorized repair center providing a proof of purchase date. If this Unit is delivered by mail, you agree to insure the Unit or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location, and to use the original shipping container or its equivalent. You must call for a return authorization number first. Under no circumstances will a unit be accepted without a return authorization number. Contact an authorized repair center or Rose Electronics for further information.

ALL EXPRESS AND IMPLIED WARRANTIES FOR THIS PRODUCT INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO A PERIOD OF ONE YEAR FROM THE DATE OF PURCHASE, AND NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER THIS PERIOD. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

IF THIS PRODUCT IS NOT IN GOOD WORKING ORDER AS WARRANTED ABOVE, YOUR SOLE REMEDY SHALL BE REPLACEMENT OR REPAIR AS PROVIDED ABOVE. IN NO EVENT WILL ROSE ELECTRONICS BE LIABLE TO YOU FOR ANY DAMAGES INCLUDING ANY LOST PROFITS, LOST SAVINGS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF OR THE INABILITY TO USE SUCH PRODUCT, EVEN IF ROSE ELECTRONICS OR AN AUTHORIZED DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS, SO THE ABOVE MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

Contents

Figures

Appendices

INTRODUCTION

Disclaimer

While every precaution has been taken in the preparation of this manual, the manufacturer assumes no responsibility for errors or omissions. Neither does the manufacturer assume any liability for damages resulting from the use of the information contained herein. The manufacturer reserves the right to change the specifications, functions, circuitry of the product, and manual content at any time without notice.

The manufacturer cannot accept liability for damages due to misuse of the product or other circumstances outside the manufacturer's control. The manufacturer will not be responsible for any loss, damage, or injury arising directly or indirectly from the use of this product (See limited warranty).

System Introduction

Thank you for choosing Rose Electronics UltraVista Pro Video Wall. The product is a flexible tool for creating multiple screen video displays. It supports a wide variety of input and output signal formats, and allows the creation of multiple groups of output screens with different characteristics. Two different chassis styles support the display of either two or four video input windows simultaneously on a given output group. The ability to zoom or crop video windows further adds to the power of display groups.

The UltraVista Pro is a high performance video processing workstation with pure hardware architecture for spectacular video wall performance. 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 UltraVista Pro . It employs large-capacity, high-speed FPGA and crosspoint switching to ensure the real-time processing of input signals, providing data consistency and guaranteeing excellent video displaying.

UltraVista Pro supports a wide variety of input signal formats, including, CVBS, YPbPr, VGA, DVI, Dual-link DVI, HDMI, SDI, twisted pair signals, and optical signals. The output signal of UltraVista Pro supports DVI-I, twisted pair signal, and optical signal. For DVI-I signal, RGB analog signal and DVI digital signal can be transmitted concurrently, which means that video signals can be displayed on a video-wall, backed up, and transmitted to another group of displays simultaneously. The resolution of a single output channel can reach up to 1920*1200@60Hz. Users can also upload and display ultra-high resolution static background images with UltraVista Pro.

A range of UltraVista Pro models are available, which differ in features and functions. The largest UltraVista Pro supports video wall display on 144 screens. UltraVista Pro also allows groups of screens to be displayed at different resolutions, providing powerful video combinations in large screen systems.

Compatibility

Video	
Input Interface	VGA, YPbPr, CVBS, DVI, HDMI, SDI, DVI Dual-Link, DisplayPort
Output Interface	VGA, DVI, HDMI, SDI
Max Resolution	1920 x 1200 @ 60 Hz or 3840 x 2400 @ 30 Hz (4K)
Control	
Serial	Accepts RS-232 serial control communication
Ethernet	Through Control Software over CATx cable

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 graphic as a "window". Customers can also zoom the windows, and drag them to anywhere on the screen

- Four Windows per Screen: UltraVista Pro supports a maximum of four windows in a single screen, allowing users to view more video signals with a smaller number of screens. The layout of the windows can be configured separately.
- Picture in Picture: A window can be overlaid upon another window, forming a “picture in picture”. The overlaid window is not restricted to the boundaries of the window beneath, allowing flexibility in display layout.
- Input Signal Preview: All input signals can be previewed in the UI of software before being displayed on the screens. This enables the operator to detect the input status and display signals correctly.
- Crosspoint Switch: UltraVista Pro employs crosspoint switch technology which offers high speed switching and transmission. Compared to the “bus” switching architecture, where all the signals need to share the bandwidth of the bus for transmission, crosspoint switching assigns each signal a unique channel to avoid collision, delay, and instability.
- Four Windows per Screen: The main modules, including input cards, output cards, switch control card, cooling fan, and power supply, are all designed to plug directly into the main-board, which makes it very flexible and convenient to configure the product for each application. It is unnecessary to disassemble the device when replacing modules. Input and output cards also support ‘hot-plugging’ which means that users can plug and unplug input or output cards when the UltraVista Pro is operating. No restarting or refreshing is required, and other signals will not be affected.
- FPGA architecture: UltraVista Pro employs a hardware FPGA-based architecture to provide excellent image processing performance. There is no embedded operating system to cause crashes, collisions, and blue screens. The result is a highly stable product which provides uninterrupted around the clock operation.
- Resolution Real-Time Total Adaptation (RRTA): UltraVista Pro employs Resolution Real-time Total Adaptation technology to support customized resolutions for different groups of screens. In other words, the resolution of each group of screens can be configured separately in the software, which offers flexibility and convenience.
- Graphic Cropping and Signal Upscaling: The all input video signals can be cropped and any section of a video image can be zoomed in or out after cropping. Upscaling ensures the zoomed sections will be displayed without loss of signal quality.
- Character Superimposition: UltraVista Pro supports superimposition of characters in video signals for easy identification of signal sources. Character font, size, position, and color can be customized for each source.
- Ultra-high Resolution background Image: UltraVista Pro’s built-in storage allows multiple ultra-high resolution background images to be uploaded, for display behind video screens.
- Scenes Saving, Loading, and Displaying in Loop: Any configured arrangement of video signals displayed can be saved as “scenes”. UltraVista Pro supports up to 32 scenes to be saved locally. The saved scenes can also be set to be loaded and displayed in loops.
- HDCP-Compliant: UltraVista Pro’s HDMI and DVI input cards support HDCP, which allows the display of HDCP encrypted content.
- Controlling and Management: UltraVista Pro software allows users to manage and control the processor from an external computer. The software is compatible with Windows2000/XP/Vista/7/8. The computer can be connected to UltraVista Pro by CATx cable (TCP/IP) or RS232 cable. The software can also control up to 4 traditional matrix switches when they are cascaded (RS232) to the processor. The UltraVista Pro can also be configured and controlled through serial commands issued by an external controller.
- Redundant Power Supply: UltraVista Pro can be provided with dual power supplies on request. The redundant supplies provide load balancing, with either supply capable of powering the device in the event a supply fails during operation.

Package contents

- UltraVista Pro unit
- Power cord
- Manual

Additional cables can be ordered separately. If the package contents are not correct, contact Rose Electronics or your reseller so the problem can be quickly resolved.

MODELS

UltraVista Pro Models

The UltraVista Pro comes in several models to fit the needs and complexity of the individual video wall installation. The unit comes in a 2U, 4U, 8U or 14U chassis. All the chassis have models which support 2 output windows per screen. In addition, 4U and 8U chassis also come in models that support 4 output windows per screen. The 2U and 4U chassis models are shown below.

Figure 1. 2U and 4U Chassis Models

Input and output cards that support various video interfaces can be installed in these chassis to provide for the best match to the needs. Some of the available cards are shown below. A complete listing of all chassis models and input and output cards can be found in Appendix A – Part Numbers.

Input Cards

Figure 2. VGA Input Card

Figure 3. DVI Single-Link Input Card

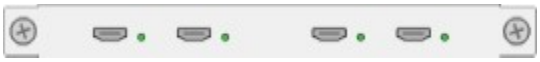

Figure 4. HDMI Input Card

Figure 5. SDI Input Card

Figure 6. Fiber Input Card

Figure 7. DVI Dual-Link Input Card

Output Cards

Figure 8. DVI-I / VGA Output Card

Figure 9. SDI Output Card

System Installation and Setup

The UltraVista Pro is easy to install. Connect the appropriate video cables from video sources to the appropriate connectors on the input cards. Connect DVI-I, HDMI, or BNC cables from the unit's output connectors to the appropriate displays. Apply power to the Video Wall Processor.

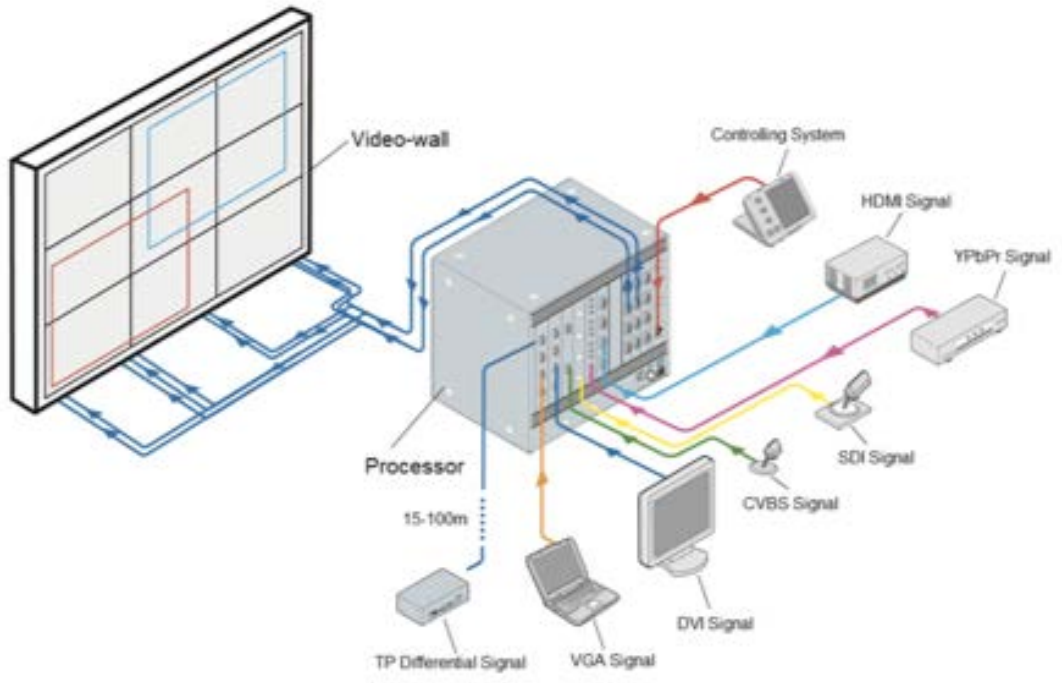

Figure 10. System Diagram of UltraVista Pro

In order to set up the video wall, install the configuration software on a Windows based PC, laptop, or tablet. Connect a CATx cable between the Video Wall Processor's RJ-45 connector and the control PC for a TCP/IP interface. Alternatively connect the control PC serially to the UltraVista Pro's RS-232 connector. Configure the input signals as desired, directing the video sources to the appropriate groups of output displays. If needed, identify and save the configuration details for future recall.

Setting up the video wall with the aid of the configuration software is described in the following section. A listing of the serial commands can be found in Appendix C – Serial Control Sequences.

Operation and Configuration

This section describes how to set up and configure the video wall using the HadesView configuration software. Once the UltraVista Pro is connected to a controlling Windows PC through a CATx cable, the configuration software can be used as described below.

Establishing Connection between UltraVista Pro and Controlling PC

Install the supplied HadesView configuration software on a Windows PC. Double click the HadesView icon on desktop after the software has been installed.

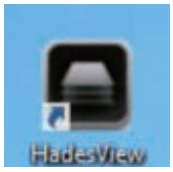

Figure 11. Configuration Software Desktop Icon

The *User Login* window will be displayed. *T*he *User Name* field will have *ADMIN* selected and the *Password* field will be empty. Click the OK button.

Figure 12. User Login Window

The configuration software's menu bar contains three tabs: *Software Operation*, *Basic Operation*, and *Tools*.

Figure 13. Menu Bar

1. Begin by clicking the *Communication Setting* option in the *Software Operation* tab. This will display the *Communication Setting* window.

Figure 14. Communication Setting Window

2. If an Ethernet connection is to be used, the default IP address and port number of the unit are *192.168.1.65* and *1024*. The IP address of the controlling PC must be changed the first time to *192.168.1.x* (where *x* is a number from *0* to *255*). This will put in the same network space as the unit, and allow them to talk to each other. Once this communication has been established, the IP address of the unit can be changed to one more suitable to the network it is in, and the IP address of the controlling PC reset to its previous setting.
3. Alternately, to establish a serial connection, select the appropriate computer COM port, and ensure that the baud rate is set to 9600.
4. Click the *OK* button to save the settings.
5. Finally, click the *Connect* button in the *Software Operation* tab to connect to the unit.

User Administration

User Administration provides the means to set up user list and access rights to the UltraVista Pro. This is accomplished by following the steps below.

1. Click the *Users* button on the *Tools* tab's menu bar to set up individual user accounts.

Figure 15. Users Menu Bar Button

2. This displays the *User Management-ADMIN* window. Enter the username and password for a user account. The user's level of access can be set by selecting the access level from the *Type* drop down list. Click the *Add* button to add the new user. Repeat until all users have been added.

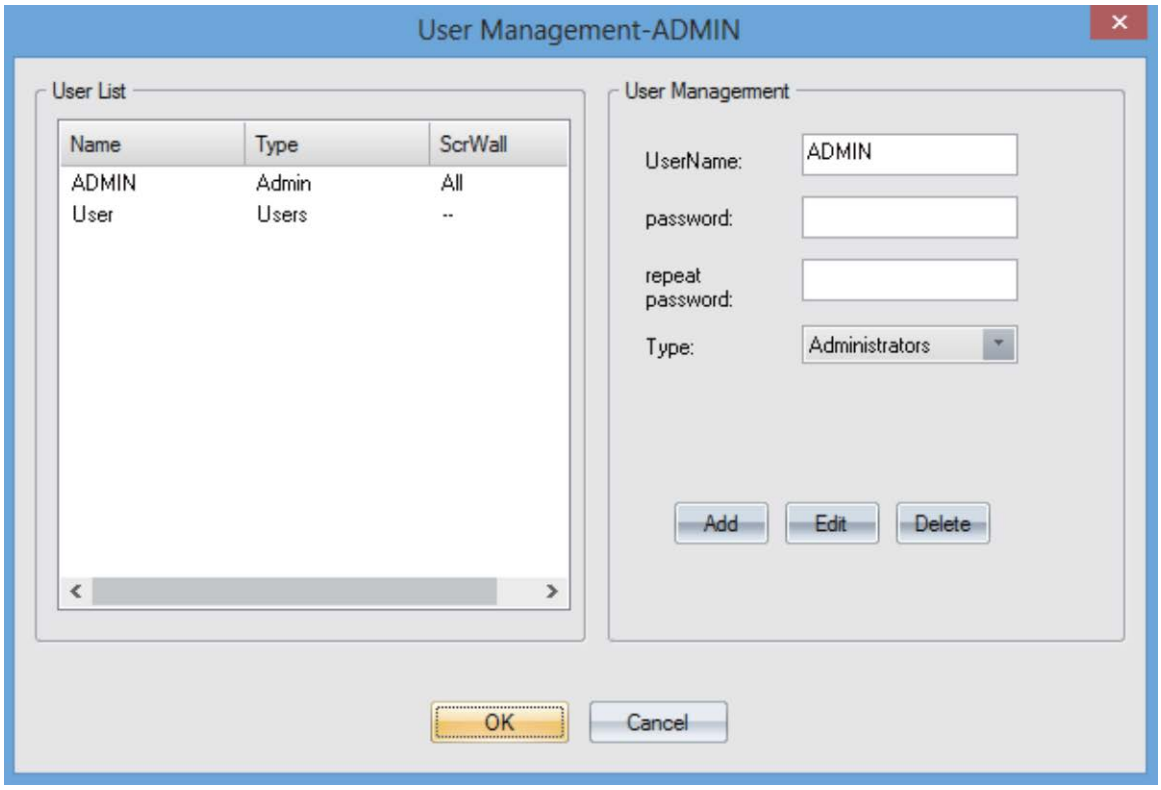

Figure 16. User Management-ADMIN Window

3. An existing user account can be viewed and modified by selecting it in the *User List*, making the necessary changes and clicking the *Edit* button. An account can be deleted by selecting it and hitting the *Delete* button.
4. Click the *OK* button to save the changes and exit the window.

Video Wall Set Up

This section describes the steps to set up the video wall and customize the video wall. Not all options may be required for a particular layout.

Video Wall Settings

The video wall can be set up in the *Screen Layout Setting* window. It can be accessed by clicking *Layout* in the *Software Operation* tab. Here, logged in users can set the output resolution, layout, and the gap between displays for up to 4 groups of video walls. For example, the figure below shows the settings for video walls 1 and 2. Their output resolution is 1920x1080@60Hz, layout is 3x4, and the gap is 0.

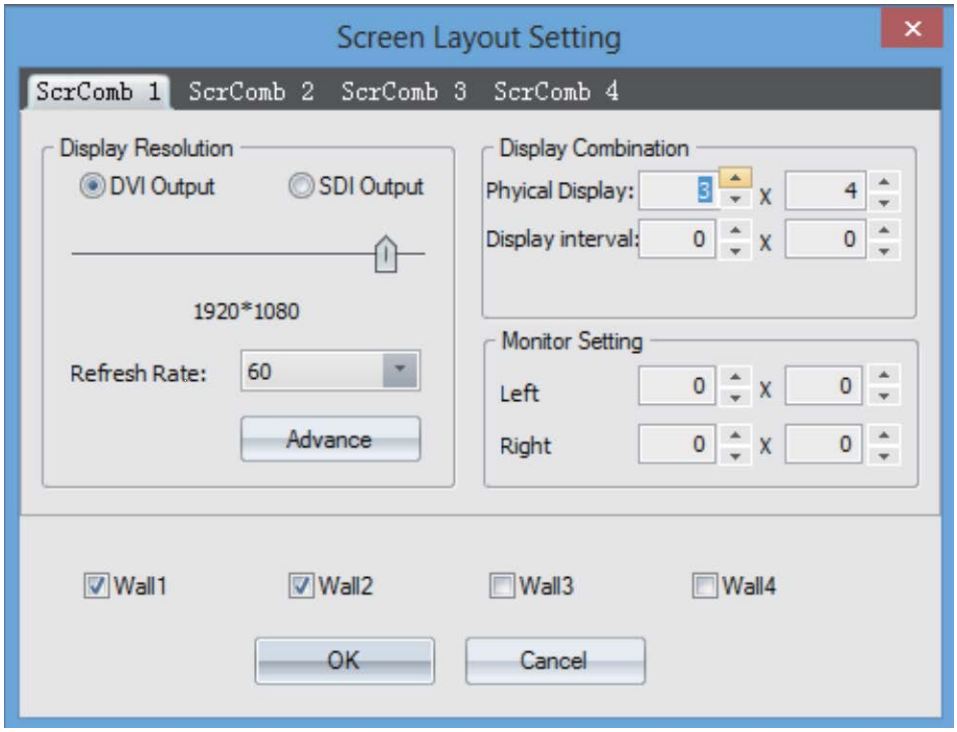

Figure 17. Video Wall Screen Layout Setting Window

Channel Mapping

Click the *Group* button in the *Basic Operation* tab's menu bar to assign physical output cards to positions in a video wall grouping.

Figure 18. Group Menu Bar Button

The *Screen Group Setting* window is displayed. Assign the desired output cards from the *Output Card List* to the video wall and click the *OK* button when complete.

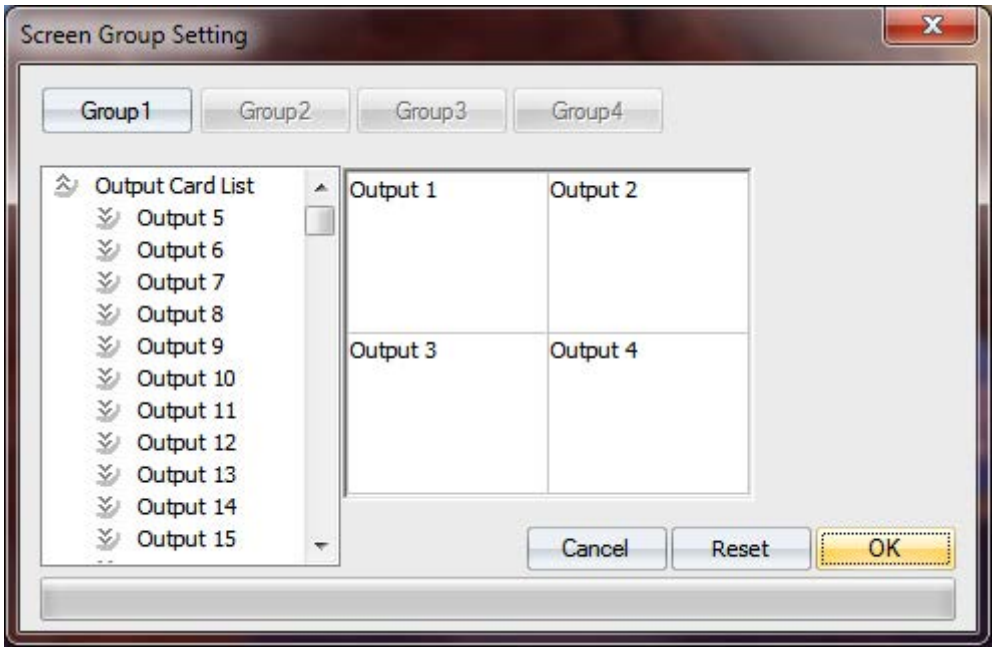

Figure 19. Screen Group Setting Window

Signal Source Settings

The list of signal sources can be found in the left side *Signal Management* pane.

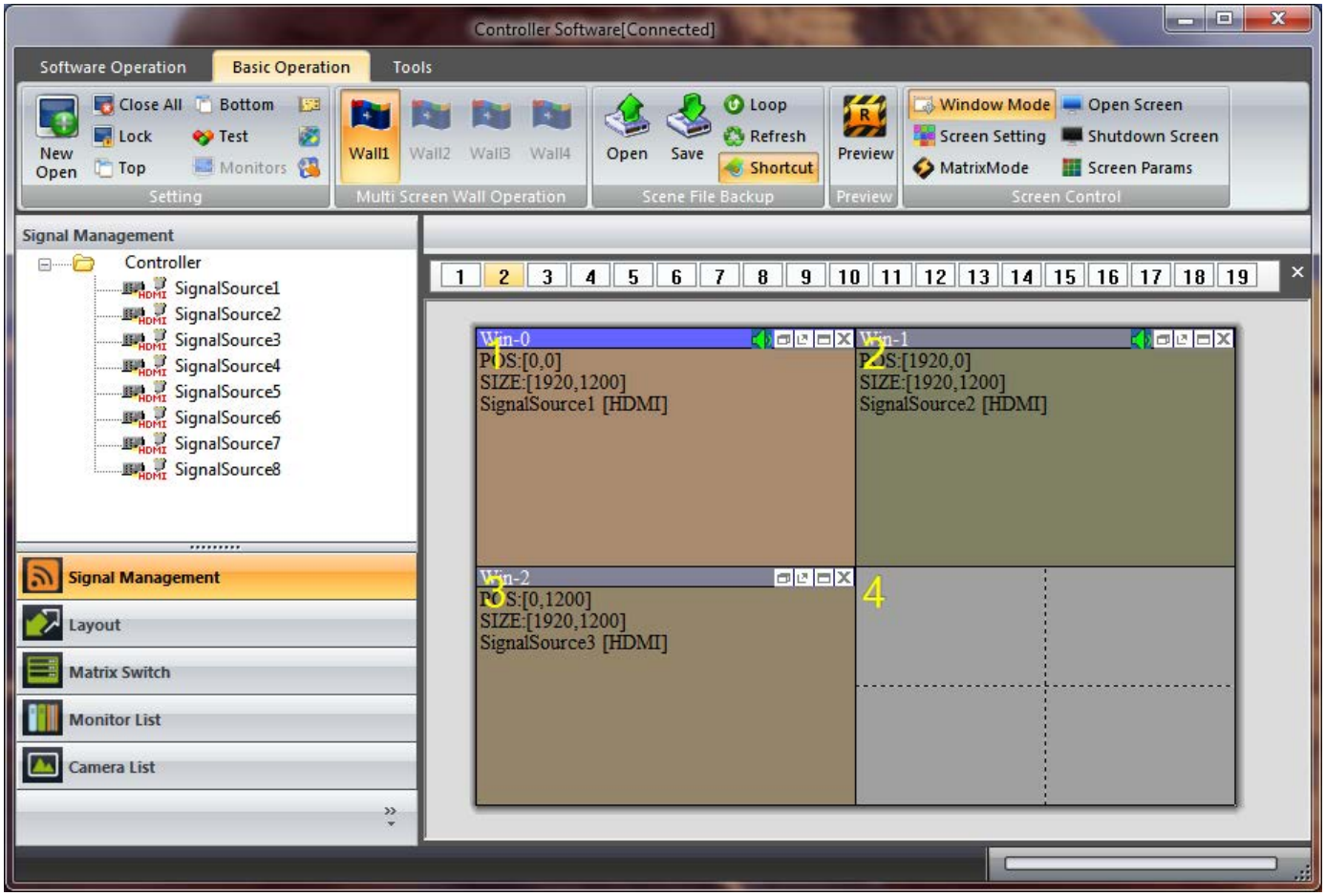

Figure 20. Signal Source

The icon of each signal source turns green when an input signal is detected on a corresponding channel.

Figure 21. Active Signal Sources

Users can configure a signal source by right-clicking on it in the *Signal Management* pane. This brings up the signal source configuration menu. The individual menu options are described below.

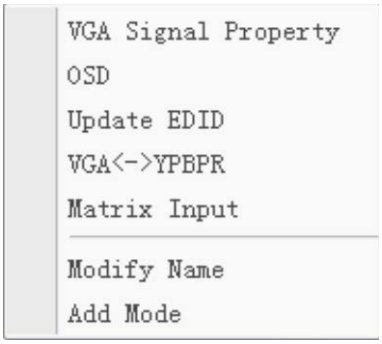

Figure 22. Signal Source Configuration Menu

VGA Signal Property

The VGA Signal Property option allows users to set the signal properties of VGA Signal Sources.

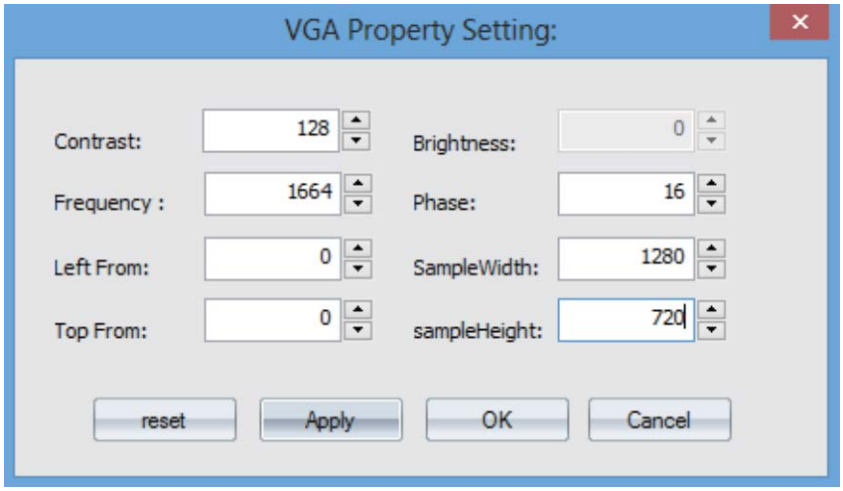

Figure 23. VGA Property Setting Window

OSD

The OSD option allows characters to be superimposed on the video of a Signal Source. Font, size, color, and position on the video image can be configured. OSD Mode 1 selects a transparent background, and OSD Mode 2 selects a solid background.

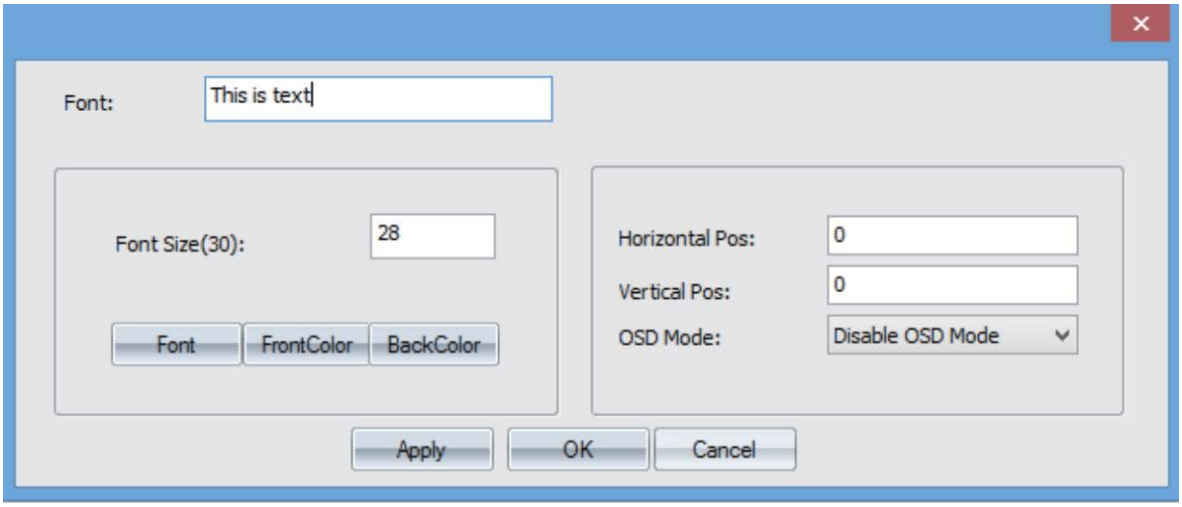

Figure 24. OSD Properties Window

Update EDID

This option allows the user to select an EDID configuration file (*.dat) to be used with a Signal Source, typically for specifying an unusual resolution. Files can be captured from video displays with the EDID Editor program supplied with the configuration software. The program also allows modification of existing files to create new files.

The EDID can be modified by clicking the *EDID* button on the *Tools* tab's menu bar.

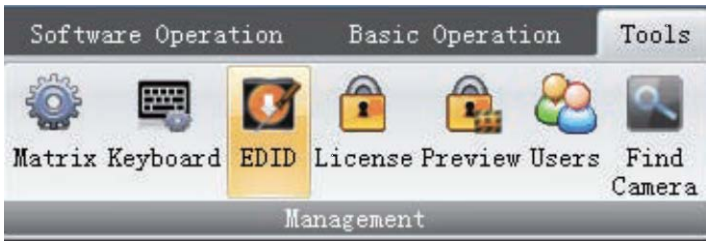

Figure 25. EDID Menu Bar Button

This opens the EDID Editor program. On the *File* menu, click the *Open* menu option to open an EDID configuration file.

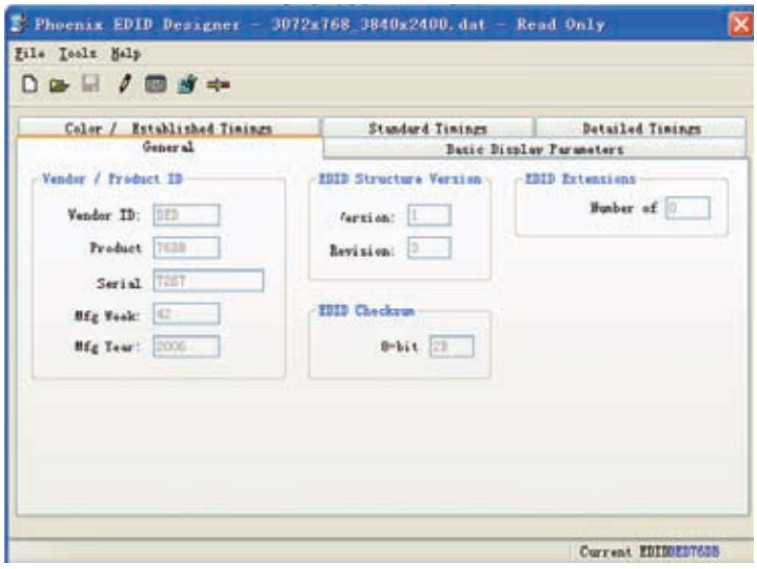

Figure 26. Opened EDID Configuration File in EDID Editor

Click the edit button on the menu bar to modify the menu bar to edit the file. The edit button is displayed below.

Figure 27. EDID Edit Configuration Button

Open the *Detailed Timings* tab, and choose the first *Descriptor Block*.

Figure 28. EDID Configuration Descriptor Blocks

The parameters for the desired screen resolution can be set, particularly the *H Active*, *V Active* and *Pixel* parameters. These respectively set the number of horizontal pixels, number of vertical pixels and the refresh rate. It is recommended that the refresh rate not be modified.

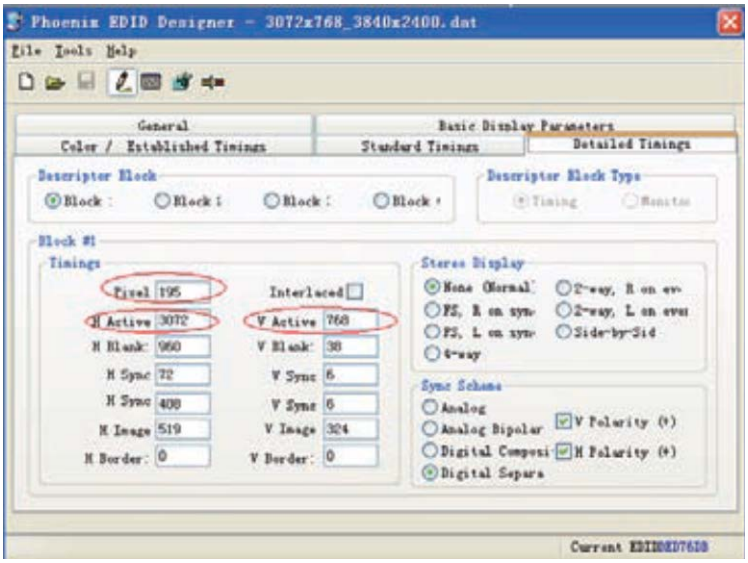

Figure 29. Modifying the Screen Resolution Using the EDID Editor

It is suggested that once changes have been made, the changes not be saved to the original configuration file, but saved as a new file.

Once the updated EDID Configuration file has been created, use the *Update EDID* menu item of the Signal Source Configuration Menu. Choose the newly created file when asked for, and the signal source will apply the new EDID.

VGA <---> YPbPr

This menu option allows a user to select the signal format of VGA Signal Sources.

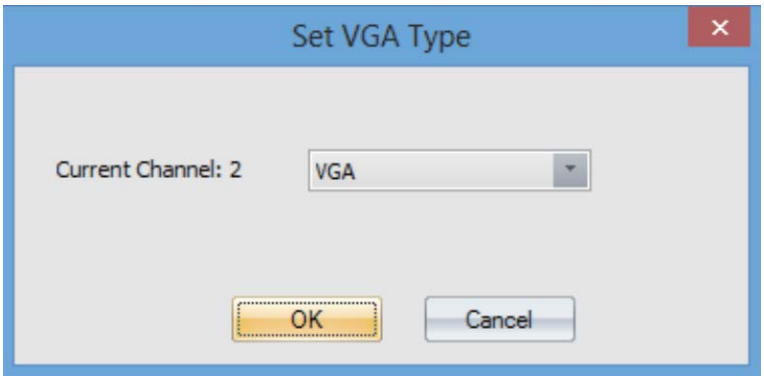

Figure 30. Set VGA Type Window

Modify Name

The name of the signal source can be specified with the *Modify Name* menu option. This will help to identify and manage the signal sources.

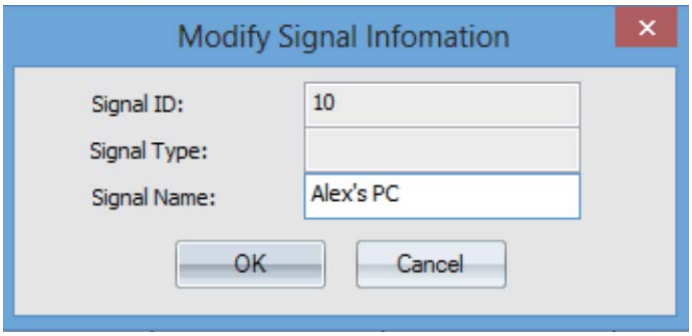

Figure 31. Modify Signal Information Window

Add Mode

The *Add Mode* menu option allows users to crop the video image of a signal source by specifying the horizontal and vertical starting pixels of the cropped signal, as well as the width and height of the video. The cropped mode can then be assigned a name.

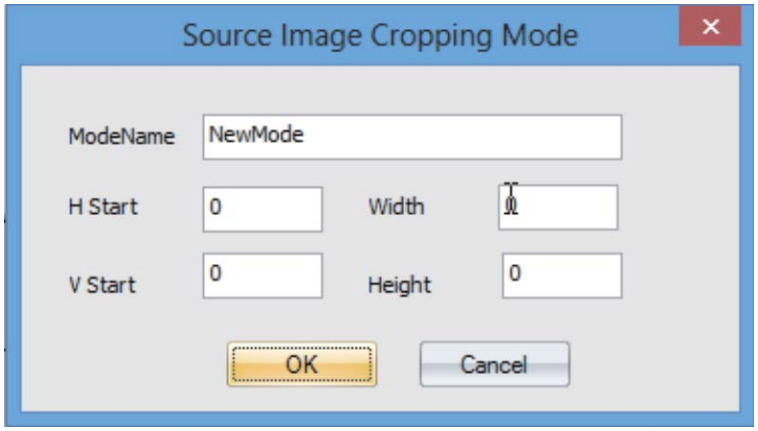

Figure 32. Source Image Cropping Mode Window

Creating and Laying Out Display Windows

Select a signal source by clicking it in the Signal Management window. Then, create a display window in the video wall by clicking the left mouse button and dragging in the gray region of the right pane. Display windows can also be created by selecting *New Open* button in the *Basic Operation* tab. The size and position of windows can be changed by clicking and dragging them within the gray video wall user interface.

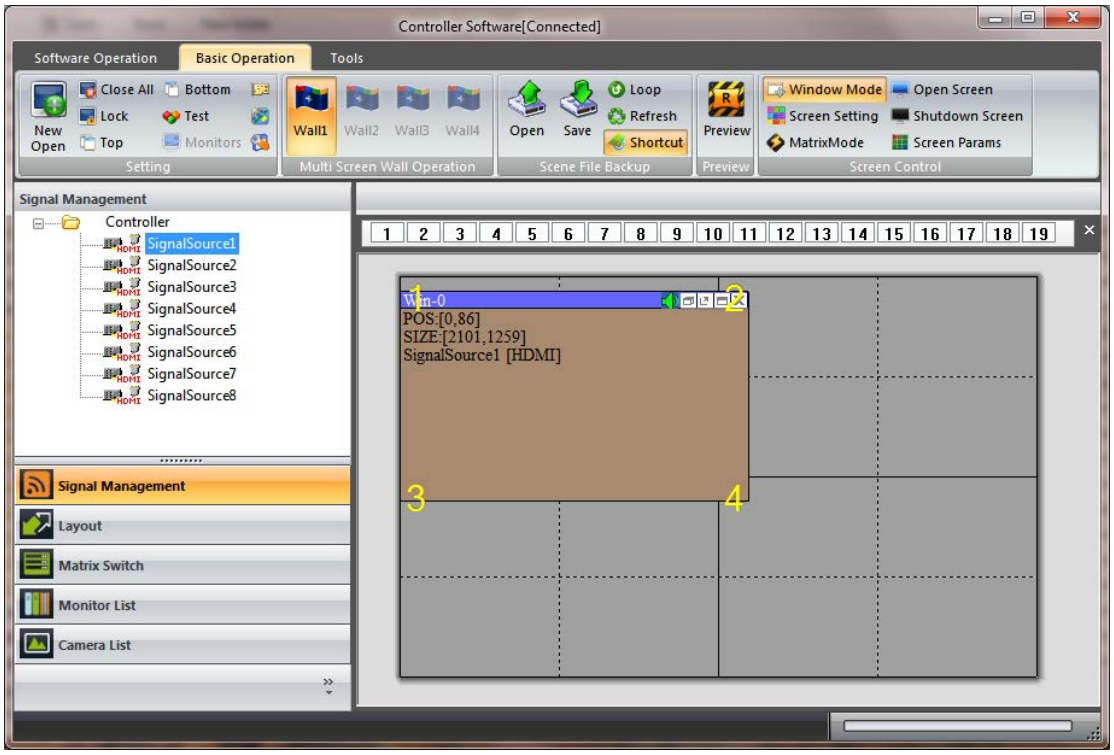

Figure 33. Creating Display Windows for the Video Wall

UltraVista Pro supports a maximum of four windows per video wall. Windows can be superimposed over each other by right clicking on them and selecting *Top* or *Bottom* to move the window above or below another window.

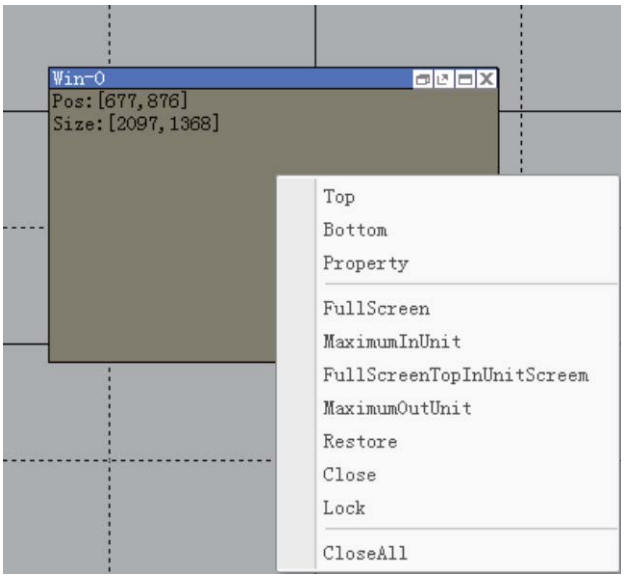

Figure 34. Specifying Whether A Display Window is to be Above or Below Another Window

Test Signal

The interface between UltraVista Pro and output displays can be tested by transmitting solid color signals or a grid pattern. To do so, select the *Test* option from the *Basic Operation* tab.

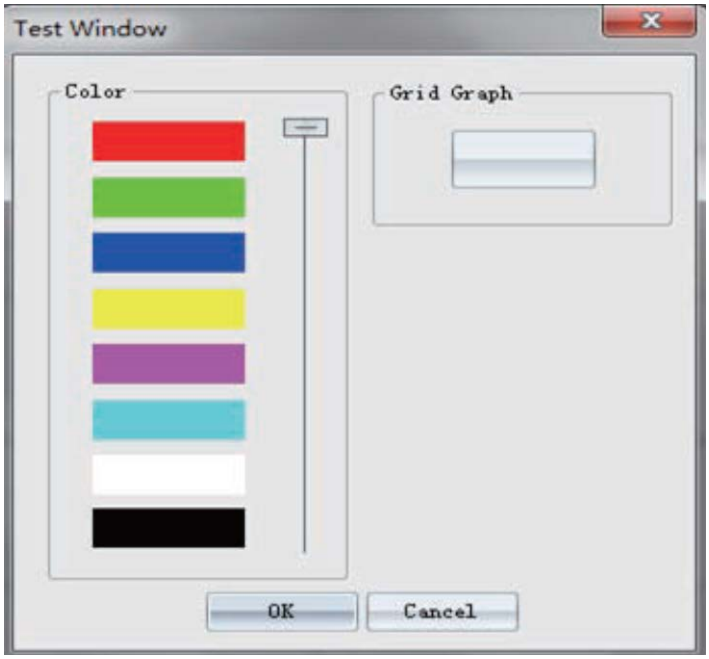

Figure 35. Test Signal Window

Scene File Backup

Video Wall configurations can be identified and saved as *scenes* for future recall. These operations are performed in the *Scene File Backup* section in the *Basic Operation* tab's menu bar.

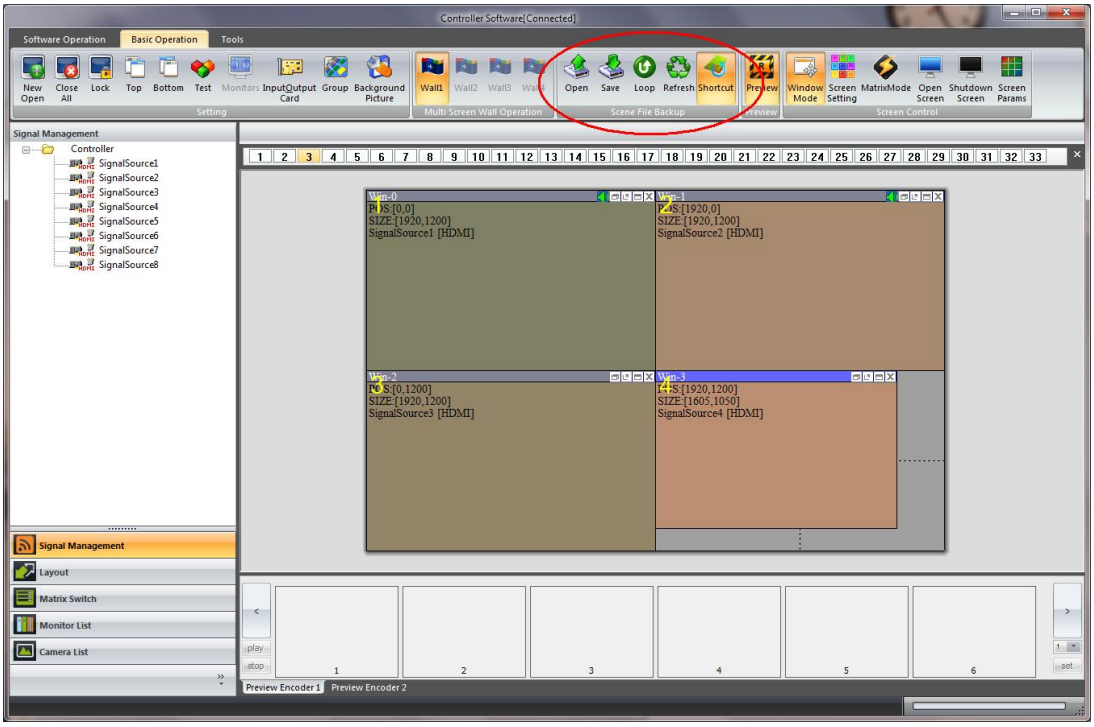

Figure 36. Working with Scenes

Click the *Save* button to save a *scene*. Previously saved *scenes* can be loaded by clicking the *Open* button, and selecting from the listed *scenes*. Alternately, saved *scenes* can be loaded by clicking the *Layout* button in the left pane. They can also be loaded and displayed in a sequential loop by clicking the *Loop* button in the menu bar.

Background Image

High definition images can be displayed as a background to any output window. Click the *Background Picture* button in the *Settings* section of the *Basic Operation* tab's menu bar.

Figure 37. Background Picture Menu Bar Button

This will open the *Background Image Operation* window. Click *Select Image* to locate and add a suitable .bmp file for background display. The image can be displayed full screen or on the selected displays.

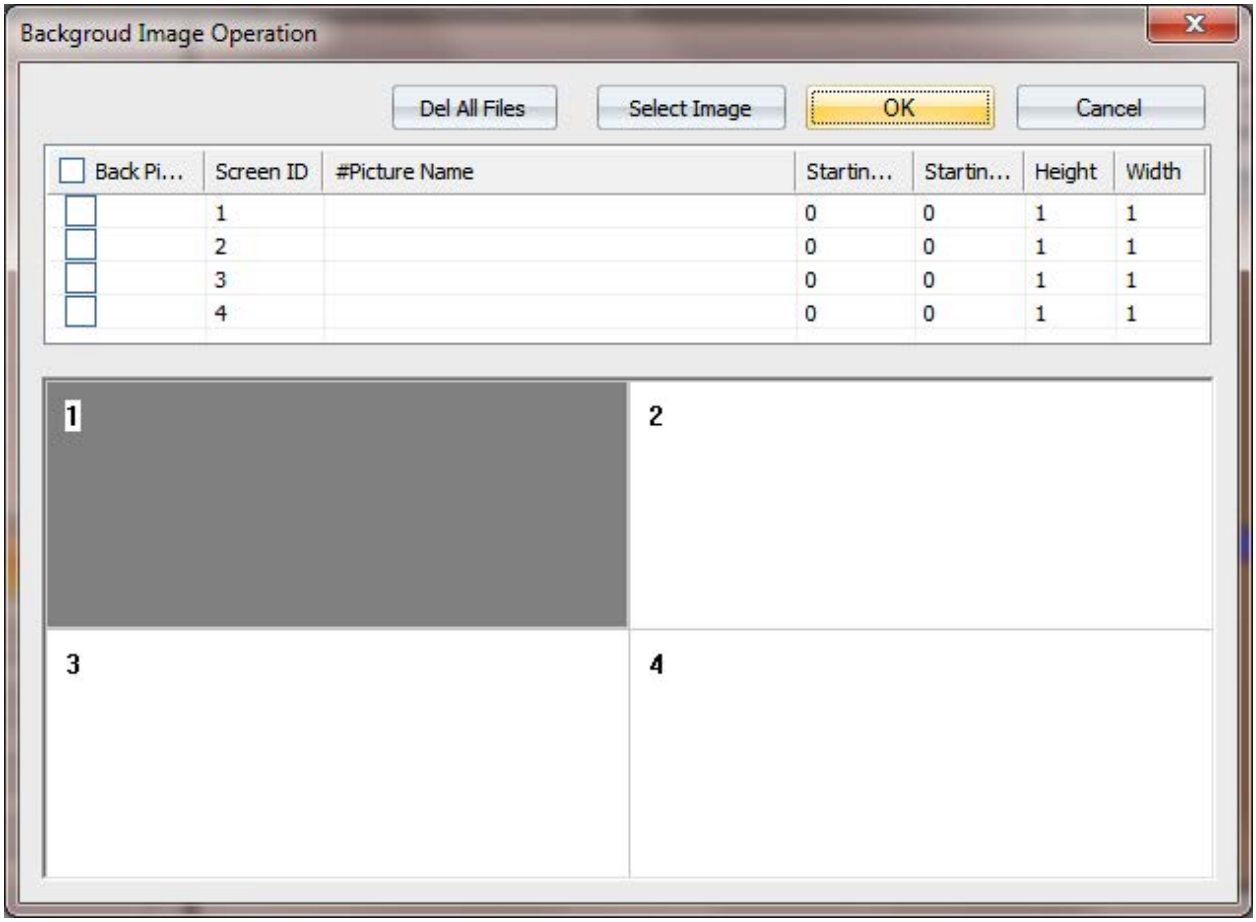

Figure 38. Background Image Operation Window

Input Signal Preview

This function can be used to preview the input signals on the controlling PC before putting them out on the video wall. To do so, click the *Preview* button in the *Basic Operation* tab's menu bar.

Figure 39. Preview Menu Bar Button

The preview region is found at the bottom of the right hand pane.

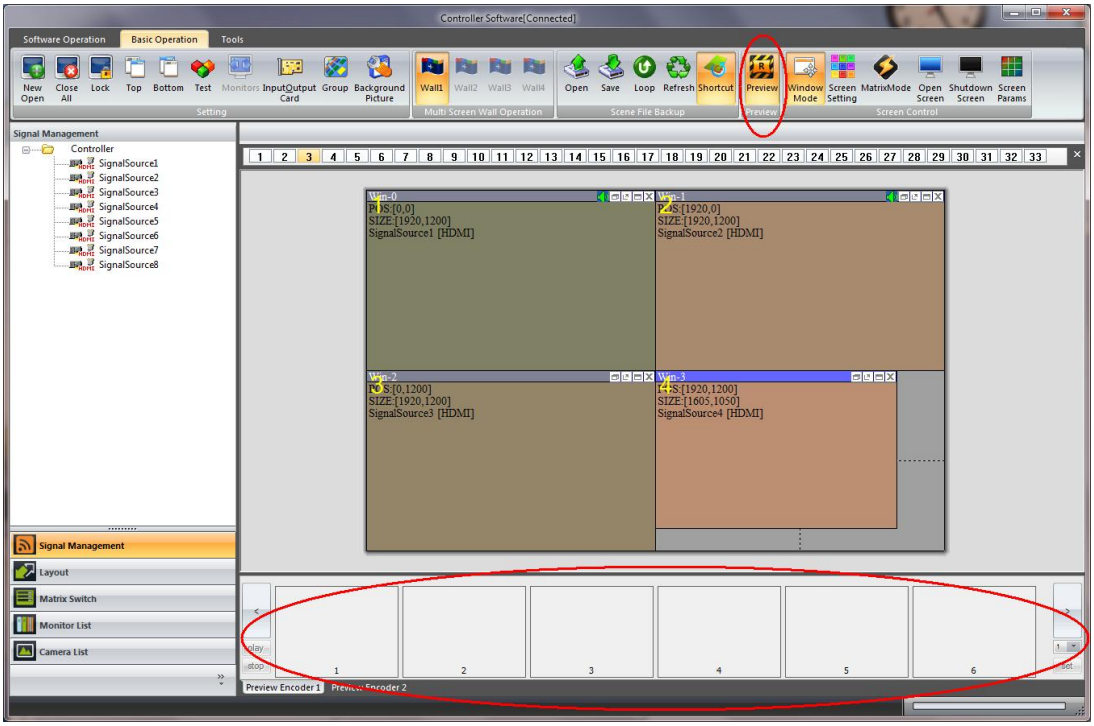

Figure 40. Input Signal Preview

The user can preview the input signal by clicking the *Play* button. Double click the preview window view it in a larger window.

Figure 41. Previewing input signals

SERVICE AND MAINTENANCE

Maintenance and Repair

This Unit does not contain any internal user-serviceable parts. In the event a Unit needs repair or maintenance, you must first obtain a Return Authorization (RA) number from Rose Electronics or an authorized repair center. This Return Authorization number must appear on the outside of the shipping container.

See Limited Warranty for more information.

When returning a Unit, it should be double-packed in the original container or equivalent, insured and shipped to:

Rose Electronics

Attn: RA_____

10707 Stancliff Road

Houston, Texas 77099 USA

Technical Support

If you are experiencing problems, or need assistance in setting up or operating your UltraVista Pro, consult the appropriate sections of this manual. If, however, you require additional information or assistance, please contact the Rose Electronics Technical Support Department at:

Phone: (281) 933-7673

E-Mail: TechSupport@rose.com

Web: www.rose.com

Technical Support hours are from: 8:00 am to 6:00 pm CST (USA), Monday through Friday.

Please report any malfunctions in the operation of this Unit or any discrepancies in this manual to the Rose Electronics Technical Support Department.

Safety

The UltraVista Pro has been tested for conformance to safety regulations and requirements, and has been certified for international use. Like all electronic equipment, the UltraVista Pro should be used with care. To protect yourself from possible injury and to minimize the risk of damage to the Unit, read and follow these safety instructions.

- Follow all instructions and warnings marked on this Unit.
- Except where explained in this manual, do not attempt to service this unit yourself.
- Do not use this unit near water.
- Assure that the placement of this unit is on a stable surface or rack mounted.
- Provide proper ventilation and air circulation.
- Keep power cord and connection cables clear of obstructions that might cause damage to them.
- Use only power cords, power adaptor and connection cables designed for this Unit.
- Use only a grounded (three-wire) electrical outlet.
- Use only the power adaptor provided with the unit.
- Keep objects that might damage this Unit and liquids that may spill, clear from this Unit. Liquids and foreign objects might come in contact with voltage points that could create a risk of fire or electrical shock.
- Operate this Unit only when the cover is in place.
- Do not use liquid or aerosol cleaners to clean this Unit. Always unplug this Unit from its electrical outlet before cleaning.

Unplug this Unit from the electrical outlet and refer servicing to a qualified service center if any of the following conditions occur:

- The power cord or connection cables are damaged or frayed.
- The Unit has been exposed to any liquids.
- The Unit does not operate normally when all operating instructions have been followed.
- The Unit has been dropped or the case has been damaged.
- The Unit exhibits a distinct change in performance, indicating a need for service.

Safety information

Documentation reference symbol. If the product is marked with this symbol, refer to the product documentation to get more information about the product.

WARNING A WARNING in the manual denotes a hazard that can cause injury or death.

CAUTION A CAUTION in the manual denotes a hazard that can damage equipment.

Do not proceed beyond a WARNING or CAUTION notice until you have understood the hazardous conditions and have taken appropriate steps.

Grounding

There must be an un-interruptible safety earth ground from the main power source to the product's input wiring terminals, power cord, or supplied power cord set. Whenever it is likely that the protection has been impaired, disconnect the power cord until the ground has been restored.

Servicing

There are no user-serviceable parts inside these products. Only service-trained personnel must perform any servicing, maintenance, or repair.

The user may adjust only items mentioned in this manual.

Appendix A – Part Numbers

Part Number	Description
VWL-CH-DP02	Chassis 2U, 2 windows/output
VWL-CH-DP04	Chassis 4U, 2 windows/output
VWL-CH-QP04	Chassis 4U, 4 windows/output
VWL-CH-DP08	Chassis 8U, 2 windows/output
VWL-CH-QP08	Chassis 8U, 4 windows/output
VWL-CH-DP14	Chassis 14U,2 windows/output
Input Cards	
VWC-IC-DPQP-04DVI	4 ports DVI Single Link
VWC-IC-DPQP-04VGA	4 ports VGA
VWC-IC-DPQP-04HDM	4 ports HDMI
VWC-IC-DPQP-04SDI	4 ports SDI
VWC-IC-DPQP-04HDB	4 ports HDBaseT
VWC-IC-DPQP-04FSM	4 ports Single Mode Fiber
VWC-IC-DPQP-02DDL-4K	2 ports DVI Dual Link (4K)
VWC-IC-DPQP-02DP11-4K	2 ports DisplayPort (4K)
Output Cards	
VWC-OC-DPQP-04DVI	4 ports DVI-I / VGA
VWC-OC-DPQP-04HDM	4 ports HDMI
VWC-OC-DPQP-04SDI	4 ports SDI
VWC-OC-DPQP-04HDB	4 ports HDBaseT
VWC-OC-DPQP-04FSM	4 ports Single Mode Fiber
VWC-OC-QP-02DDL-4K	2 ports DVI Dual Link (4K)
VWC-OC-QP-02HD-4K	2 ports HDMI 1.4 (4K)

Appendix B – Specifications

General

Interfaces	
Input	VGA, DVI Single-Link, DVI Dual-Link (4K), HDMI, SDI, HDBaseT, DisplayPort (4K), Single-Mode Fiber
Output	VGA, DVI Single-Link, DVI Dual-Link (4K), HDMI, SDI, HDBaseT, HDMI 1.4 (4K), Single-Mode Fiber
Control	Using Control Software through TCP/IP, or RS232
ESD Protection	Human body model - ±8kV (air gap discharge) & ±4kV (contact discharge)
Power	
Power Supply	AC 100 -240 VAC 50-60 Hz / 150 Watts (max)
Consumption	60 Watts (max)
Environmental Conditions	
Operating Temperature	32ºF to 104ºF / 0ºC to 40ºC
Storage Temperature	14ºF to 122ºF / -10ºC to 50ºC
Relative Humidity	Up to 80%, non-condensing

Chassis

	Rack Size	**Dimensions (in/mm)**	**Maximum Inputs**			**Maximum Outputs**	
			Digital 1080p	Digital 4K	Analog	Digital 1080p	Digital 4K
VWL-CH-DP02	2U	17.2 x 3.5 x 15.0 / 438 x 89 x 380	8	4	32	8	–
VWL-CH-DP04	4U	17.2 x 7.0 x 15.0 / 438 x 178 x 380	16	8	64	16	–
VWL-CH-QP04	4U	17.2 x 7.0 x 15.0 / 438 x 178 x 380	24	4$^{\Delta}$	96	8	4
VWL-CH-DP08	8U	17.2 x 14.0 x 15.0 / 438 x 356 x 380	32	16	128	36	–
VWL-CH-QP08	8U	17.2 x 14.0 x 15.0 / 438 x 356 x 380	52	8$^{\Delta}$	208	18	9
VWL-CH-DP14	14U	17.2 x 24.5 x 15.0 / 438 x 623 x 380	64	32	256	72	–

$^{\Delta}$ indicates that 4K input cards can only be used in specified input slots

Input Cards

	VGA	DVI Single-Link	DVI Dual-Link (4K)	HDMI	SDI	DisplayPort (4K)	HDBaseT	Optical Fiber
Signal Format	RGBHV	DVI-D digital T.M.D.S. signal in DVI 1.0	Dual-Link DVI	HDMI 1.3 with HDCP	HD-SDI / 3G-SDI	DisplayPort 1.1	HDBaseT	Single-Mode Optical Signal
Maximum Resolution	1920 x 1200	1920 x 1200	3840 x 2400	1920 x 1200	720p / 1080p	3840 x 2400	1920 x 1200	1920 x 1200
Color Depth	32 bits / pixel	32 bits / pixel	–	–	–	–	–	–
Horizontal Scan Rate	15 – 90 kHz	–	–	–	–	–	–	–
Signal Level	–	T.M.D.S 2.9V - 3.3V	–	–	–	–	–	–
Sync	Separate Sync	–	–	–	–	–	–	–
Custom EDID	Yes	Yes	Yes	Yes	–	Yes	Yes	–
Impedance	75 Ω	50 Ω	50 Ω	–	75 Ω	–	–	–
Reference Level	0.7 V p-p		–	–	–	–	–	–
Maximum Data Rate	–	4.95 Gbps	9.6 Gbps	4.95 Gbps	3 Gbps	–	–	–
Connector	RGB: 15 pins D-sub (DB15 / DE-15F)	24 + 5 pins / DVI-aI	24 + 5 pins / DVI-I	HDMI Type A	BNC	DisplayPort	RJ45	LC

Output Cards

	DVI/VGA	SDI	Twisted Pair	Optical Fiber
Signal Format	DVI-I in DVI 1.0 Standard	HD-SDI / 3G-SDI	Twisted pair differential signal	Single-mode optical signal
Maximum Resolution	1920 x 1200	720p / 1080p	1920 x 1200	1920 x 1200
Color Depth	32 bits / pixel	–	32 bits / pixel	
Maximum Transmission Distance	82 ft / 25 m (DVI)	–	328 ft / 100 m	32808 ft / 10 km
Output Backup	–	Yes	–	
Signal Level	T.M.D.S. 2.9V-3.3V		–	
Impedance	50 Ω	75 Ω	–	
Connector	24 + 5 pins / DVI-I （Adapter required for VGA output)	BNC	RJ45	LC

Appendix C – Serial Control Sequences

1. ***wmod* – Set a video wall's layout**
   Usage: *<wmod,Screen_ID,hnum,vnum,hgap,vgap>*
   Parameters:

Screen_ID	The video wall ID, where 0 = video wall 1
Hnum	The number of video displays in a row
Vnum	The number of video displays in a column
Hgap	The horizontal gap between displays, in pixels
Vgap	The vertical gap between displays, in pixels

   Example:
   - *<wmod,0,3,2,15,15>* means video wall 1 consists of 2 rows of displays, with 3 displays per row and 15 pixel gaps between adjacent displays, both vertically and horizontally.

2. ***sset* – Set the output resolution of a single display in a video wall**
   Usage: *<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>*
   Parameters:

Screen_ID	The video wall ID, where 0 = video wall 1
total_line	Total lines per frame
total_pix	Total pixels per line
act_vpos	Vertical starting point of the active lines
act_vsize	Total number of active lines per frame
act_hpos	Horizontal starting point of the active pixels
act_hsize	Total number of active pixels per line
hs_width	Horizontal synch width
vs_width	Vertical synch width
dis_freq_h	Integer component of pixel clock frequency
dis_freq_l	Fractional component of pixel clock frequency
hsync_pol	Polarity of the horizontal synch
vsync_pol	Polarity of the vertical synch

   Example:
   - *<sset,0,1235,2080,31,1200,118,1920,32,6,154,0,0,0>* sets video wall 1 display output to 1920x1200.

3. ***open* – Create an output window in a specified video wall**
Usage: *<open, Screen_ID,W_ID,SourceCh,src_hstart,src_hsize,src_vstart,src_vsize,x0,y0,x1,y1>*
Parameters:

Screen_ID	The video wall ID, where 0 = video wall 1
W_ID	The ID of the window
SourceCh	The input channel to be used as the window's video source
src_hstart	The signal source's horizontal starting pixel
src_hsize	The signal source's final horizontal pixel. A value of zero means use the full horizontal size of the original source (and src_hstart is irrelevant).
src_vstart	The signal source's vertical starting pixel
src_vsize	The signal source's final vertical pixel. A value of zero means use the full vertical size of the original source (and src_vstart is irrelevant).
x0	The window's starting horizontal pixel in the video wall
y0	The window's final horizontal pixel in the video wall
x1	The window's starting vertical pixel in the video wall
y1	The window's final vertical pixel in the video wall

Example:
- *<open,1,0,1,0,0,0,0,0,0,1365,767>* creates an output window with ID 0 on video wall 2, with input channel 1 as the video source, and no cropping of the source image.

4. ***move* – Move an existing output window**
Usage: *<move,W_ID,SourceCh,src_hstart,src_hsize,src_vstart,src_vsize,x0,y0,x1,y1>*
Parameters: The command parameters are identical to those for the *open* command.

5. ***icha* – Switch a specified window's input signal to a different source**
Usage: *<icha,W_ID,SourceCh,src_hstart,src_hsize,src_vstart,src_vsize>*
Parameters:

W_ID	The ID of the window
SourceCh	The window's video source input channel
src_hstart	The signal source's starting horizontal pixel
src_hsize	The signal source's final horizontal pixel. A value of zero means use the full horizontal size of the original source (and src_hstart is irrelevant).
src_vstart	The signal source's starting vertical pixel
src_vsize	The signal source's final vertical pixel. A value of zero means use the full vertical size of the original source (and src_vstart is irrelevant).

Example:
- *<icha,1,3,0,0,0,0>* switches input channel 3 to window 1, with no cropping of the signal source.

6. ***save* – Save the current display settings of a video wall**
Usage: *<save,Scene_ID,Wall_ID>*
Parameters:

Scene_ID	The number of the scene to save the video wall configuration to, where 0 = Scene 1
Wall_ID	The video wall ID, where 0 = video wall 1

Example:
- *<save,2,2>* saves the current video wall settings of video wall 3 to scene 3.

7. ***call* – Load a saved scene to a specified video wall**
Usage: *<call,Scene_ID,Wall_ID>*
Parameters

Scene_ID	The scene number to be loaded, where 0 = Scene 1
Wall_ID	The video wall ID, where 0 = video wall 1

Example:
- *<call,5,1>* loads saved scene 6 to video wall 2.

8. ***torb* – Set a window to top or bottom**
Usage: *<torb,W_ID,Z>*
Parameters:

W_ID	The ID of the window
Z	0: Set to top; 1: Set to bottom

Example:
- *<torb,1,0>* sets Window 1 to top.

9. ***rset* – Close all windows**
Usage: *<rset,Screen_ID>*
Parameter:

Screen_Id	The video wall ID, where 0 = video wall 1

Example:
- *<rset,0>* closes all windows of video wall 1.

10. ***shut* – Close a single window**
Usage: *<shut,W_ID>*
Parameter:

W_ID	The ID of the window

Example:
- *<shut*,3> closes window 3.

11. ***rcpm* – Read the video parameters of the input channel**
Usage: *<rcpm,SourceCh>*
Parameters:

SourceCh	The window's video input channel ID

Return value(s):

Contrast	
Brightness	
Freq	Sampling frequency
Phase	
Left	Left starting point
Right	Right starting point
Top	Top starting point
Bottom	Bottom ending point

Example:
- *<rcpm,4>* reads the parameters of input channel 4.

12. *wcpm* – Modifying the input channel parameters

Usage: *<wcpm,SourceCh,contrast,brightness,freq,phase,left,right,top,bottom>*

Parameters:

SourceCh	The video input channel ID, starting with 1
Contrast	
Brightness	
Freq	Sampling frequency
Phase	
Left	Left starting point
Right	Right starting point
Top	Top starting point
Bottom	Bottom ending point

Example:

- *<wcpm,4,128,128,1904,0014,0384,1824,0031,0931>* modifies input channel 4, setting contrast to 128, brightness to 128, sampling frequency to 1094, left starting point to 0014, right ending point to 1824, top starting point to 0031 and bottom ending point to 0931.

13. *scpm* – Factory reset of VGA input channel

Usage: *<scpm,SourceCh >*

Parameters:

SourceCh	The VGA video input channel ID, starting with 1

Example:

- *<scpm,4>* factory resets input channel 4.

14. *tmod* – Set the output display mode

Usage: *<tmod,Screen_ID,mode,grid,R,G,B>*

Parameters:

Screen_ID	The video wall ID, where 0 = video wall 1
mode	0: normal mode; 1: grid mode; 2: pure color mode
grid	The spacing between adjacent lines in grid mode
R,G,B	The RGB color space value in pure color mode

Example

- *<tmod,0,0,0,0,0,0>* sets output display to normal mode.

15. *sena* – Enable the video wall

Usage: *<sena,Screen_id,Screen_en>*

Parameters:

Screen_ID	The video wall ID, where 0 = video wall 1
Screen_en	0: disabled; 1: enabled

Example:

- *<sena,1,1>* enables video wall 2.

16. *winf* – Video Wall information inquiry

Usage: <*winf,Screen_ID,*>

Parameters:

Screen_ID	The video wall ID, where 0 = video wall 1

Example:

- <*winf,0*> might cause the following return:

```
<The valid window ID is :
0,
hnum is 2
vnum is 2
hgap  is 0
vgap  is 0
hsize is 1920
vsize is 1200
background_pic_en is 0
background_pic_addr  is  1152
background_pic_hsize is  1024
background_pic_vsize is  768
background_pic_hpos is   0
background_pic_vpos is   0
background_pic_hnum is  1
background_pic_vnum is  1
screen_en is 1
The current out_table for 0  is  :
0 : 1,1 : 2,2 : 3,3 : 4>
```

17. *vinf* – Current Input Status Inquiry

Usage: <*vinf* >

Parameters: None

Example

- <*vinf*> might cause the following return:

```
<The valid Input is :
SRC TYPE SIGNAL SUB_VALID
01 HDMI 1
02 HDMI 0
03 HDMI 0
04 HDMI 0>
```

18. *widf* – Window Information Inquiry

Usage: <*widf,W_ID*>

Note: A space is required between the command and the window ID.

Parameter:

W_ID	The ID of the window

Example:

- <*widf, 0*> might cause the following return:

```
<The 0 window is:
source is  2
screen is  0
src_hstart is  0
src_hsize  is  0
src_vstart is  0
src_vsize  is  0
hstart  is 0
hend   is  1919
vstart  is 0
vend   is  1199>
```

19. *smod* – Set Sync mode

Usage: <*smod,Screen_id,sync_mode*>

Parameters:

Screen_id	The video wall ID, where 0 = video wall 1
Sync_mode	0: asynchronous; 1: synchronous

Example:

- <*smod,1,1*> sets video wall 2 synch mode to synchronous.

20. *ocov* – Set an output port's channel mapping

Usage: <*ocov,Screen_ID,logic_ch,phy_ch*>

Parameters:

Screen_ID	The video wall ID, where 0 = video wall 1
logic_ch	The logical channel corresponding to the layout of the screen, starting with zero at the upper left, and increasing from left to right, then top to bottom
phy_ch	The physical port on the device

Example:

- <*ocov,1,0,4*> maps video wall 2 logical channel 0 to physical port 5.

21. *QIPR* – Device network parameters inquiry

Usage: <*QIPR*>

Parameters: None

Example

- <*QIPR*> might cause the following return:

```
< IP:   192.168.  1. 65
 MAC:   00-08-DC-01-02-03
MASK:   255.255.255.  0
GATE:   192.168.  1.  1
PORT0:  1024, PORT1: 1025>
```

22. *mipr* – Change the Device network parameters

Usage: *<mipr,ip[4],mac[6],mask[4],gar[4],port[2]>*

Parameters:

ip[4]	IP address, 4 decimal numbers
mac[6]	MAC address, 6 decimal numbers
mask[4]	Subnet mask, 4 decimal numbers
gar[4]	Gateway, 4 decimal numbers
port[2]	Ports, 2 decimal numbers

Note: Ensure that the MAC address is entered as decimal numbers.

Example:

- *<mipr,192,168,1,65,0,8,14,0,16,8,255,255,255,0,192,168,1,1,1024,1025>* sets the device IP address to 192.168.2.65, the MAC address to 00-08-0E-00-10-08, the subnet mask to 255.255.255.0, the gateway to 192.168.1.1, and the port numbers to 1024 and 1025.

23. *font* – Superimpose characters on input video channels

Usage:*<font,SourceChl,hstart,vstart,Mode,front_color_R,front_color_G,front_color_B,back_color_R,back_color_G,back_color_B>*

Parameters:

SourceChl	Input channel ID
Hstart	Horizontal starting point of characters
Vstart	Vertical starting point of character
Mode	Character superimposition mode 0 – no superimposition 1 – character is front color, background is the original image 3 - character is front color, background is the specified background color
front_color	Front color
back_color	Back color

Note: The size of the character zone is fixed at 512 x 32. The buffer of character zone is 2028 bytes. Each bit represents one pixel, giving 512 x 32 pixels.

24. *tset* – Set Device date and time

Usage: *<tset,second,minute,hour,day,date,month,year,century>*

Note: Day value begins with 1 for Monday.

Example:

- *<tset,00,14,18,01,25,04,16,20>* will cause a return value <OK>, and set the time and date to 6:14:00 PM, Monday, April 25, 2016 .

25. *trea* – Retrieve Device date and time

Usage: <*trea*>
Parameters: None
Example:

- <*trea*> might cause the following return:
  <YEAR : 2016
  MONTH : 4
  DATE : 25
  DAY : 1
  HOUR : 18
  MINUTE: 14
  SECOND: 39>

Note: A Day value of 1 means Monday.

26. *bken* – Enable and disable the background image

Usage: <*bken,Screen_ID,bk_en,flash_base,pic_hsize,pic_vsize*>
Parameters:

Screen_ID	Video wall number
bk_en	0 : disable background image 1 : enable background image
flash_base	Storage 'page' address of the desired background image in flash (one page = 2048 bytes)
pic_hsize	Horizontal width of the background image
pic_vsize	Vertical height of the background image

27. *imod* – Set the input signal format for VGA/YPbPr input cards

Usage: <*imod,in_ch,mode*>
Parameters:

in_ch	Input channel number
mode	0: VGA; 1: YPbPr

ROSE.COM

WWW.ROSE.COM ▪ sales@rose.com ▪ (800) 333-9343

Rose Electronics ▪ 10707 Stancliff Road ▪ Houston, Texas 77099
Rose USA (281) 933-7673 ▪ Rose Europe +49 (0) 2454 969442
Rose Asia +65 6324 2322 ▪ Rose Australia +61 (0) 421 247083

ROSE ELECTRONICS

WWW.ROSE.COM