



9 Display Video Wall Processor



Model #: DVI-VIDEOWALL-9X



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Table of Contents

Section 1: Getting Started	4
1.1 Important Safeguards	4
1.2 Safety Instructions	4
1.3 Regulatory Notices Federal Communications Commission (FCC)	5
1.4 Introduction	5
1.5 Package Contents.....	8
1.6 Before Installation.....	8
1.7 Panel Description	9
1.7.1 DVI-VIDEOWALL-9X Front Panel	9
1.7.2 DVI-VIDEOWALL-9X Rear Panel.....	9
1.7.3 Inputs and Outputs	10
1.8 Installation	11
1.9 Operation and Software	12
1.9.1 System Requirements	12
1.9.2 System Connection.....	12
1.9.3 Software Operation.....	13
1.9.3.1 State	13
1.9.3.2 Settings.....	14
1.9.3.3 Connect	14
1.9.3.4 Disconnect.....	14
1.9.3.5 Input Resolution.....	14
1.9.3.6 Main Source	14
1.9.3.7 Sub Source.....	14
1.9.3.8 Display Layout Mode.....	14
1.9.4 Setup Individual Output Channel	15
1.9.5 CASCADING	17
1.10 Supported Resolutions.....	18

1.10.1 DVI-IN	18
1.10.2 DVI-OUT.....	18
1.11 General Troubleshooting	19
Section 2: Specifications.....	20

Section 1: Getting Started

1.1 Important Safeguards

Please read all of these instructions carefully before you use the device. Save this manual for future reference.

What the warranty does not cover

- Any product, on which the serial number has been defaced, modified or removed.
- Damage, deterioration or malfunction resulting from:
 - Accident, misuse, neglect, fire, water, lightning, or other acts of nature, unauthorized product modification, or failure to follow instructions supplied with the product.
 - Repair or attempted repair by anyone not authorized by us.
 - Any damage of the product due to shipment.
 - Removal or installation of the product.
 - Causes external to the product, such as electric power fluctuation or failure.
 - Use of supplies or parts not meeting our specifications.
 - Normal wear and tear.
 - Any other causes which does not relate to a product defect.
- Removal, installation, and set-up service charges.

1.2 Safety Instructions

The Avenview DVI-VIDEOWALL-9X. 9-Display Video Wall Processor has been tested for conformity to safety regulations and requirements, and has been certified for international use. However, like all electronic equipment's, the DVI-VIDEOWALL-9X should be used with care. Read the following safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Do not dismantle the housing or modify the module.
- Dismantling the housing or modifying the module may result in electrical shock or burn.
- Refer all servicing to qualified service personnel.
- Do not attempt to service this product yourself as opening or removing housing may expose you to dangerous voltage or other hazards
- Keep the module away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Have the module checked by a qualified service engineer before using it again.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

1.3 Regulatory Notices Federal Communications Commission (FCC)

This equipment has been tested and found to comply with Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

1.4 Introduction

The Avenview DVI-VIDEOWALL-9X, 9-Display Video Wall Processor is a powerful, most cost effective, and fully real time data/video processor for multiple flat panel displays or projectors. Thru DVI transmission, the quality of the outcome videos is guaranteed. The output display is grained up to 255 by 255 squares. Virtually any setups for the display layout can be possible by the provided software. The DVI-VIDEOWALL-9X allows you to manipulate two input videos, wherever positions and whatever sizes you want for viewing. The embedded scalar converts signals from two of the input sources to match the native resolution of monitors, flat panel displays, projectors as well as user-selectable output settings up to WUXGA (1920x1200). The DVI-VIDEOWALL-9X sends the resulting mixed video thru DVI interface to the connected monitors/projectors based on the display layout. The layout can be readily modified to fit your applications and optimize visual effects. Typical applications include digital signage, and broadcasting/education/surveillance systems etc.

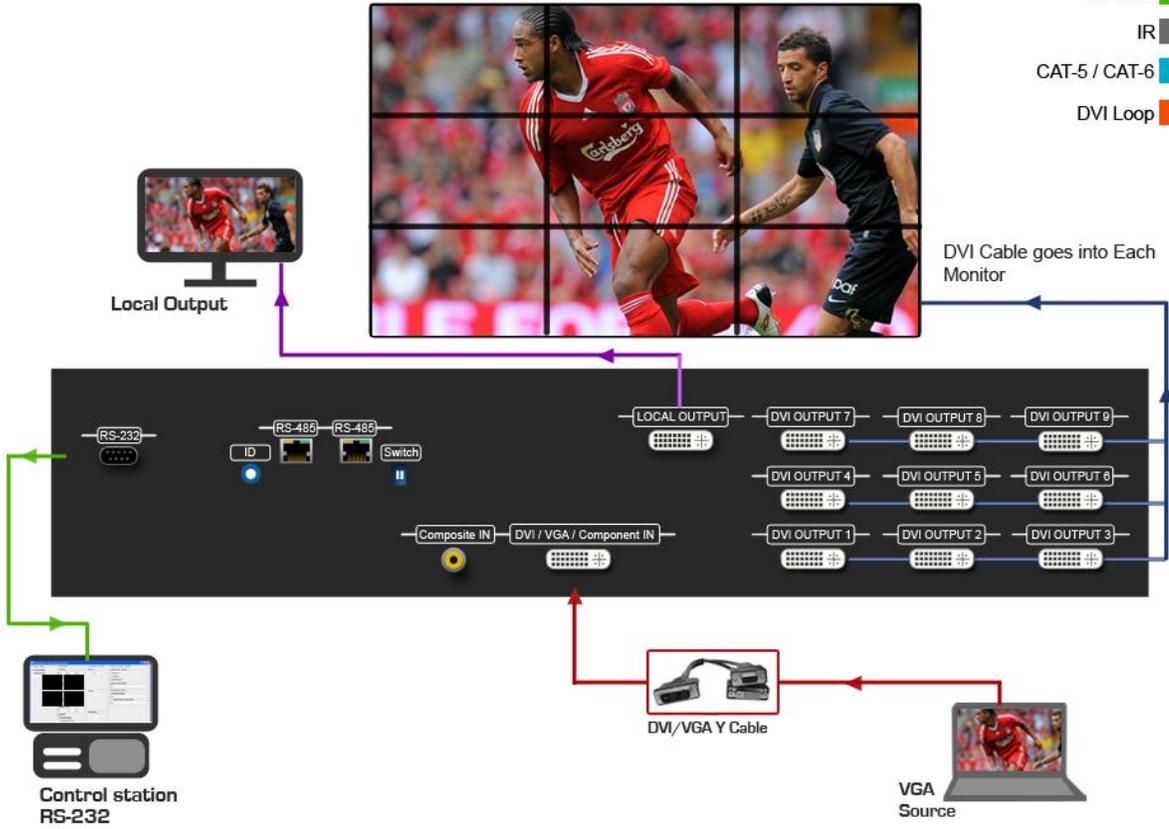
- Nine DVI outputs from 640x480 to 1920x1200 with a local loop out for monitoring
- Supports HDMI, DVI, S-Video, CVBS, Component, and VGA input, from 640x480 to 1920x1200, interlaced or progressive
- Advanced video de-interlace for improving 480i and 576i SD video input
- PIP, PAB, Full screen modes and adjustable size & position through software
- Resize, position, flip, zoom output video
- Perfectly as a video screen splitter, a video converter and a video switcher
- Each DVI output has an independent controllable display area
- User-selectable output settings, up to 1920x1200
- Can be cascaded to obtain more displays
- Image parameters and layouts are automatically saved in flash memory of the device and can be recalled for later use
- Several Image parameters and layouts can be saved in computers and can be loaded for later use
- Software control through RS-232/RS-485
- Built-in long distance RS-232 control port over Cat-5e
- Firmware upgradable for support of new features and technology enhancements
- Built-in factory reset switch
- 2U size

DVI-VIDEOWALL-9X

LAYOUT 1

CABLE INDEX

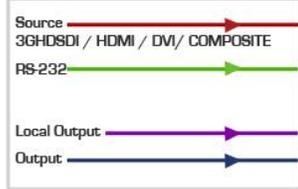
- Output ■
- Input / Source ■
- S/PDIF ■
- Audio ■
- RS-232 ■
- IR ■
- CAT-5 / CAT-6 ■
- DVI Loop ■



DVI-VIDEOWALL-9X

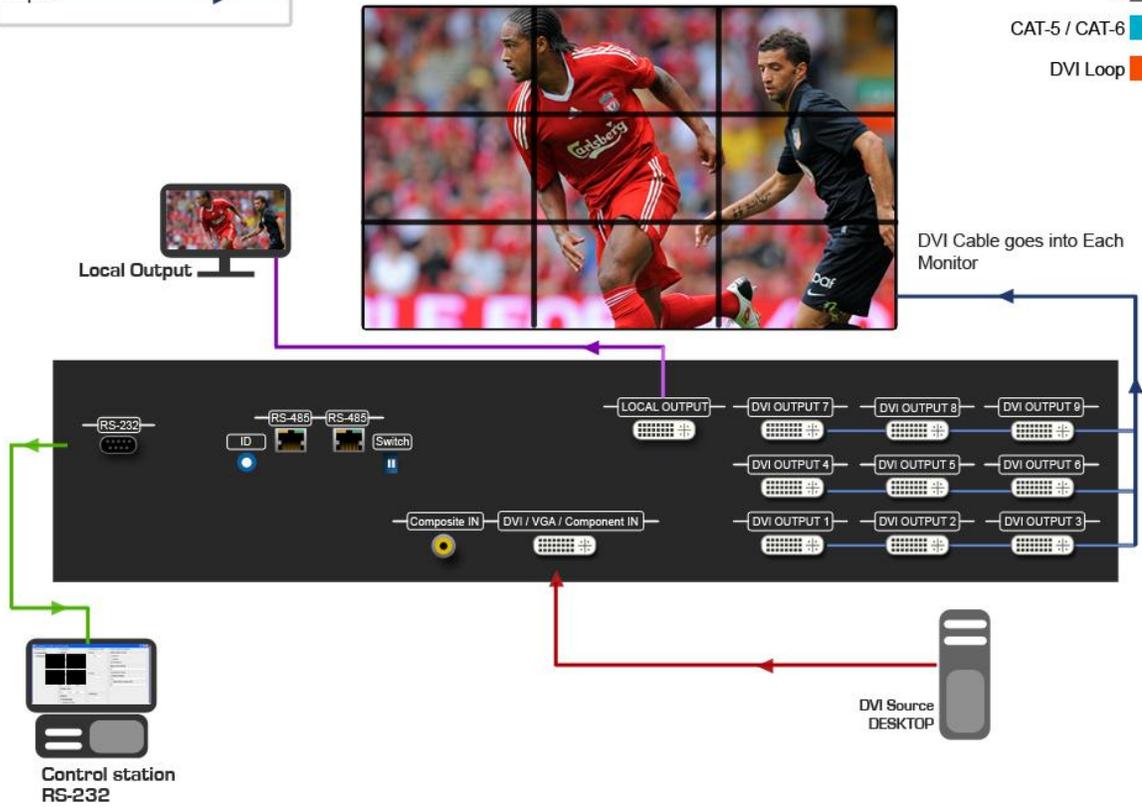
LAYOUT 2

SOURCE & OUTPUT CABLES



CABLE INDEX

- Output (Blue square)
- Input / Source (Red square)
- S/PDIF (Yellow square)
- Audio (Black square)
- RS-232 (Green square)
- IR (Grey square)
- CAT-5 / CAT-6 (Cyan square)
- DVI Loop (Orange square)



1.5 Package Contents

Before you start the installation of the converter, please check the package contents.

- DVI-VIDEOWALL-9X	x 1
- RS232 to USB Adapter	x 1
- Rack-mounting Kit	x 2
- UL AC Power Cord	x 1
- Installation Software CD	x 1
- DVI to VGA Adapter	x 1
- Component to VGA Adapter	x 1
- DVI to DVI & VGA breakout cable	x 1
- Composite & S-Video breakout cable	x 1
- User's Manual	x 1

1.6 Before Installation

- Put the product in an even and stable location. If the product falls down or drops, it may cause an injury or malfunction.
- Don't place the product in too high temperature (over 50°C), too low temperature (under 0°C) or high humidity.
- Use the DC power adapter with correct specifications. If inappropriate power supply is used then it may cause a fire.
- Do not twist or pull by force ends of the optical cable. It can cause malfunction.

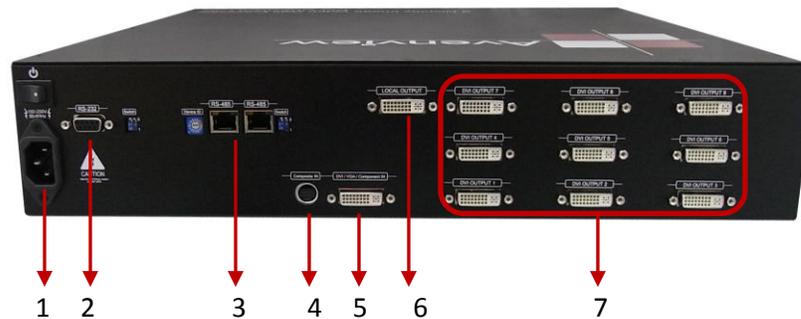
1.7 Panel Description

1.7.1 DVI-VIDEOWALL-9X Front Panel



- | |
|-------------------------------------|
| 1. LED: Shows current configuration |
|-------------------------------------|

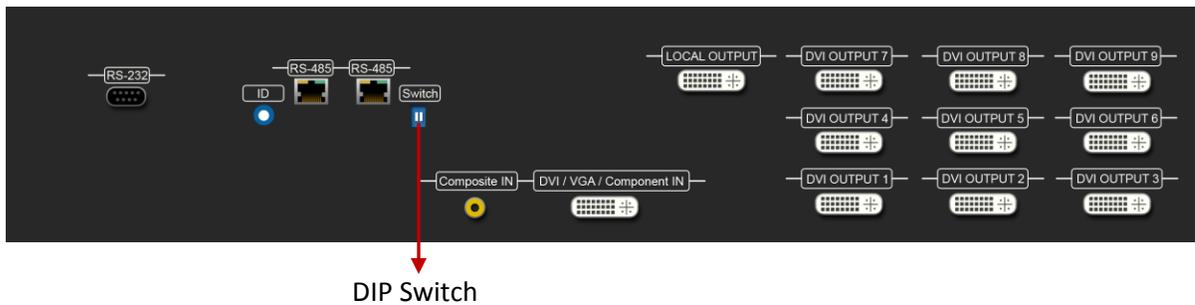
1.7.2 DVI-VIDEOWALL-9X Rear Panel



1. AC Power	2. RS232 Connector
3. RS485 Connector	4. S-Video/Composite Input Connector
5. DVI Input Connector	6. DVI Local Output Connector
7. DVI Output Connectors 1 – 9	

1.7.3 Inputs and Outputs

The Avenview DVI-VIDEOWALL-9X can accept inputs from HDMI, DVI, CVBS, YPbPr, VGA and accepts both graphics and video signals, which come from computers and NTSC/PAL video sources respectively. There is a concept of main channel and sub channel for this device. You can pick up one of the digital inputs and one of the analog inputs, and then DVI-VIDEOWALL-9X will display the mixed video on the connected 9 displays. With an advanced de-interlace built in, low resolution but popular video formats such as NTSC/PAL will be improved.



Default: Turn on the DVI-VIDEOWALL-9X then switch both DIP switches simultaneously up and down to factory default mode.

The IO Ports supports various resolution from 640x480 up to 1920x1200, for more details of the supported modes, please refer to the Section – Supported resolution



1.8 Installation

To setup Avenview DVI-VIDEOWALL-9X follow the steps outlined below for connecting to a device.

1. Use the best quality DVI, VGA, Composite, S-Video cables.
2. Turn OFF DVI-VIDEOWALL-9X and all devices that are to be connected to it.
3. Connect 9 Monitors (or projectors, TV or other display devices) to DVI OUTPUT of DVI-VIDEOWALL-9X.
4. Connect the Source device (such as, PC, DVD Player, Media Player etc.) to DVI-VIDEOWALL-9X.
5. Connect a Windows based laptop or desktop (that will used to configure the DVI-VIDEOWALL-9X) to DVI-VIDEOWALL-9X by a –pm RS-232 to USB Adapter.
6. Power ON DVI-VIDEOWALL-9X.
7. Turn ON all devices connected to DVI-VIDEOWALL-9X and then setup the DVI-VIDEOWALL-9X from the system through RS-232 to USB Adapter and provided Avenview software.

DO NOT block the sides of this device or stack another device on the top or bottom of the DVI-VIDEOWALL-9X. If sides of the units are blocked it will block the air flow from the fans on the side of the unit. This could cause system to over-heat, which may result in system failure.

The unit uses convection and fans to cool. Do not block the sides of this device or stack another device on the top or bottom of the DVI-VIDEOWALL-9X.

1.9 Operation and Software

1.9.1 System Requirements

The Avenview DVI-VIDEOWALL-9X includes Software Control program which runs under Windows XP / 2000 / Vista / 7.

Connect the provide RS-232 to USB adapter to DVI-VIDEOWALL-9X and USB Port to your Windows based system that will be used to configure the DVI-VIDEOWALL-9X. Once it is connected to USB Port, Windows will look for appropriate drivers. If you are using an older version of Windows, then insert the Installation CD (provided) and have Windows search for drivers (you may need to download latest drivers from Prolific's website if you are using Windows Vista or Windows 7).

1.9.2 System Connection

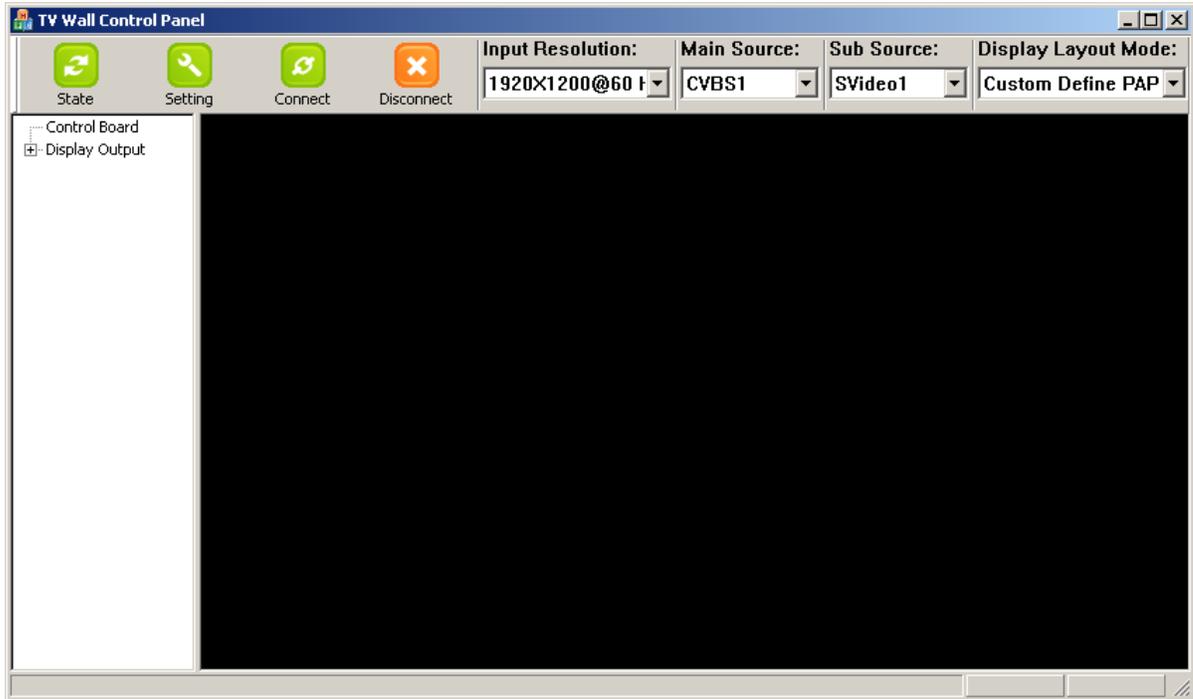
1. Power up the DVI-VIDEOWALL-9X and you can see Vacuum Fluorescent Display (VFD) on the front panel blinks. Make sure the serial port (RS232) connection is secured.
2. When Avenview software is launched, let it automatically detect the device response from RS-232 port. The process takes 5 – 15 seconds. If there is no response, a warning window will show up.



The possible reasons causing above error could be:

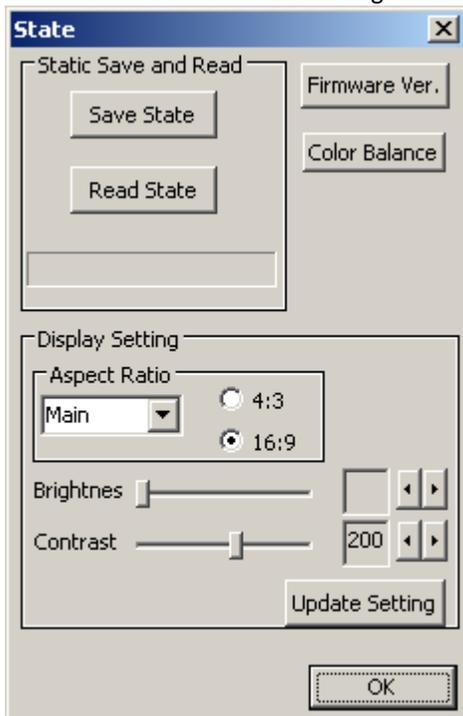
- *No Power to DVI-VIDEOWALL-9X or it is in sleep state. If this is the case then check the power and restart the DVI-VIDEOWALL-9X*
- *The serial connection is not well established. Please ensure that drivers are properly installed and all cables are securely connected. Check device manager, and ensure that RS-232 to USB Adapter is assigned a COM Port # and there is no exclamation mark.*

1.9.3 Software Operation



1.9.3.1 State

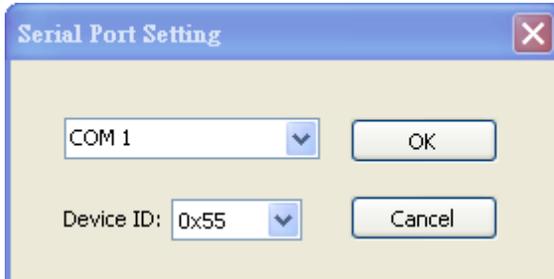
Overall State and Format Settings:



1. Save and Read: The current layout of the nine outputs can be saved to a file. The file can be uploaded in the future to resume the settings.
2. Display Setting: The main and sub sources, both can be adjusted to 16:9 or 4:3 aspect ratio. The brightness and contrast of the mixed video also can be adjusted for different requirement. After adjusting the settings, press Update Setting to save the changes.
3. Firmware Ver.: Display the current firmware of the device.
4. Color Balance: The color of the video can be automatically adjusted. It only works when the source is Analog and the mode is Full Screen.

1.9.3.2 Settings

Setting for correct COM Port for Serial Control and the Device number for identification.



1.9.3.3 Connect

Makes connection to attached device via RS232 to USB Adapter.

1.9.3.4 Disconnect

Disconnects the attached device.

1.9.3.5 Input Resolution

Here you can set the resolution of Input. It can take up to 10 seconds for new resolution to take effect.

1.9.3.6 Main Source

Choose one of the Input sources from DVI, VGA, CVBS or S-Video

1.9.3.7 Sub Source

Choose one of the Input sources from DVI, VGA, CVBS or S-Video

1.9.3.8 Display Layout Mode

Setting the layout of the main and sub sources in mixed video.

1. Main Full Screen: Only main source is displayed in the mixed video
2. Sub Full Screen: Only sub source is displayed in the mixed video
3. PIP Mode: The main source is displayed as the background, and the sub source is shown as Picture-in-Picture.
4. Side by Side: The two input sources are displayed side by side
5. Custom Define PAP: User can adjust the layout of the two input sources without any limitations.

Main and Sub sources can be from the same Input.

1.9.4 Setup Individual Output Channel

There are totally 9 channel outputs for DVI-VIDEOWALL-9X, and each output can be independently setup to display any area of the input video. Each output can be with different output resolutions to adapt different combinations of monitors or projectors.

- [-] Display Output
 - Display Output 1
 - Display Output 2
 - Display Output 3
 - Display Output 4
 - Display Output 5
 - Display Output 6
 - Display Output 7
 - Display Output 8
 - Display Output 9

To select each individual Output to setup with preferable output, please click on the desired Output, and the control dialog windows will show up accordingly.

The screenshot shows the 'Display Output 1' control dialog window. It is divided into several sections, each highlighted with a red box and a corresponding number in a red box:

- 1:** A preview window showing a black video frame with a small white rectangle indicating the selected area.
- 2:** Two side-by-side tables for 'Original Input Video' and 'Selected area'. The 'Original Input Video' table has fields for Init X (273), Init Y (41), Width (1920), and Height (1080). The 'Selected area' table has fields for Init X (273), Init Y (41), Width (320), and Height (216).
- 3:** The 'Output Resolution' section, which includes a dropdown menu set to '1920X1080@60 Hz', a checked 'Capture Mode Enable' checkbox, an unchecked 'Auto Apply Settings' checkbox, and two buttons: 'Update Status' and 'Update Apply Settings'.
- 4:** The 'Display Area Setting' section, which is enabled. It contains six sliders for X Total (6), X Start (1), X End (1), Y Total (5), Y Start (1), and Y End (1).
- 5:** The 'Fine Tune by Percentage' section, which is enabled. It has a 'Reference' section with 'Specified Area' selected and 'Full Input' unselected. Below are four rows for Top, Bottom, Left, and Right, each with a pattern icon, a slider, and a numeric input field set to 0.
- 6:** The 'Fine Tune by Pixel' section, which is disabled. It has the same layout as the percentage section but with a numeric input field set to 0.

For each display, users can define which area of the input video is to be displayed. Fundamentally, setup the X Total and Y Total first, and then define the upper-left (X Start, Y Start) and bottom-right (X End, Y End) corners for each display channel. The control panel to achieve this goal is as shown.

1	This area demonstrates the resulting selection of the Input video to be display for the selected Output Channel.
2	<p>“Original Input Video” shows the resolution information of the Input Video to each Output Channel. It varies up the Input Video</p> <p>“Selected Area” shows the information of the selected area to be displayed. The numbers will vary according to different settings.</p>
3	<p>“Output Resolution”: In this section, you can setup the output resolution for individual Output Channel. Notice that each display can output at different resolutions depending on supported resolution of the connected monitor/TV to that output channel.</p> <p>“Capture Mode Enable” will enable parameters effective. <u>If users disabled this selection, each output channel will display simply the full display of the input source.</u></p> <p>“Auto Apply Settings” will automatically load the new settings into processor.</p> <p>Clicking on “Update Status” will keep the information of Input video updated</p> <p>Clicking on “Update Apply Settings” will load the parameters into the video processor.</p>
4	Define X Total, Y Total, Upper-Left X, Y point coordinates using scroll bars or manually keying in this section. This section will roughly define these quantities which are needed for each Output channel. The resulting capture area corresponds to the Input video is illustrated in Window to left.
5	<p>“Fine Tune by Percentage” provides the alternative to further adjust the position and area defined in section 4.  For Outward Extension  For Inward Shrink</p> <p>By percentage, users need to determine what will be the reference. There are two choices for this part “Specified Area” and “Full Input”. Normally, “Specified Area” will work more appropriately while users are dealing with panel masking, because the overlapped masking area will be closed to specified area instead of full input video.</p>
6	“ Fine Tune by Pixel ” offers similar approach to adjust the position and area of the Output channel. The idea behind this section is the same to “ Fine Tune by Percentage ”. The difference is that the adjustment is based on Pixel. Users can therefore adjust the Output Channel area based on Pixels.

1.9.5 CASCADING

The Avenview DVI-VIDEOWALL-9X can be cascaded with as many as 255 DVI-VIDEOWALL-9X devices.

To cascade two DVI-VIDEOWALL-9X, connect a DVI cable from Local Output of Unit 1 to DVI Input of Unit 2.



1.10 Supported Resolutions

1.10.1 DVI-IN

Supported Mode	Resolution	Supported Mode	Resolution
480P/525P	720x483 @60Hz	MAC	832x624 @75Hz
480P (16:9)	960x483 @60Hz	VESA	1024x768 @60Hz
576P/625P	720x756 @50Hz	MAC	1024x768 @60Hz
(HDTV) 720p	1280x720 @50Hz	VESA	1024x768 @70Hz
(HDTV) 720p	1280x720 @60Hz	IBM	1024x768 @72Hz
(HDTV) 1080p	1920x1080 @30Hz	VESA	1024x768 @75Hz
VESA	720x400 @85Hz	MAC	1024x768 @75Hz
VESA	640x350 @85Hz	VESA	1024x768 @85Hz
VESA	640x400 @85Hz	VESA	1152x864 @75Hz
IBM	720x400 @70Hz	MAC	1152x870 @75Hz
IBM	720x350 @70Hz	SUN	1152x900 @66Hz
IBM	640x350 @70Hz	SUN	1152x900 @76Hz
IBM	640x400 @70Hz	VESA	1280x960 @60Hz
VESA	640x480 @60Hz	VESA	1280x960 @85Hz
MAC	640x480 @67Hz	VESA	1280x1024 @60Hz
VESA	640x480 @72Hz	HP	1280x1024 @60Hz
VESA	640x480 @75Hz	IBM	1280x1024 @67Hz
VESA	640x480 @85Hz	HP	1280x1024 @72Hz
VESA	800x600 @56Hz	VESA	1280x1024 @75Hz
VESA	800x600 @60Hz	SUN	1280x1024 @76Hz
VESA	800x600 @72Hz	VESA	1600x1200 @60Hz
VESA	800x600 @75Hz	VESA	1920x1200 @60Hz
VESA	800x600 @85Hz		

1.10.2 DVI-OUT

Supported Mode	Resolution	Supported Mode	Resolution
(HDTV) 720p	1280x720 @50Hz	VESA	1280x768 @60Hz
(HDTV) 720p	1280x720 @60Hz	VESA	1366x768 @60Hz
(HDTV) 1080p	1920x1080 @60Hz	VESA	1400x1050 @60Hz
VESA	640x480 @60Hz	VESA	1400x1050 @50Hz
VESA	800x600 @60Hz	VESA	1152x864 @75Hz
VESA	1024x768 @60Hz	VESA	1600x1200 @60Hz
VESA	1152x864 @75Hz	VESA	1920x1200 @50Hz
VESA	1280x1024 @60Hz	VESA	1920x1200 @60Hz
VESA	1280x1024 @50Hz		

1.11 General Troubleshooting

Problem	Possible Solution
No Power	<ul style="list-style-type: none"> • Check if AC Power Cord is firmly plugged into DVI-VIDEOWALL-9X • If you are recovering from Power Outage, leave the device OFF for a while and then power it ON again.
Off-Center Screen Image, Odd Colors or No Picture	<ul style="list-style-type: none"> • Make sure all cables are in good working condition and properly connected DVI-VIDEOWALL-9X. • Configure the Output video resolution so that it doesn't exceed the native supported resolution of TV/Monitor/Projector (Display). Usually a message of "Out of Range" is display on TV/Monitor. • Every time you change the resolution of Input Source, wait 10 – 20 seconds. After the resolution is changed, the selection of Input and the Display layout mode will return to default. Adjust the Input source and Display Layout Mode to your requirements again. • VGA Source can take up to 10 Seconds before it is recognized
Poor Quality Video	<ul style="list-style-type: none"> • We suggest you don't use T-Connectors to split your video source into images displayed on two difference screens. This lowers the Output video quality. Use a distribution amplifier instead of T-Connectors • Make sure the video source is not compressed and maintains the highest native resolution
Wrong Color	<ul style="list-style-type: none"> • Press "Color Balance" key in "State" for auto configuration.
Poor Linking	<ul style="list-style-type: none"> • When the linking of the Serial Control cannot work, reboot DVI-VIDEOWALL-9X to establish the link.

Section 2: Specifications

Item	Description
Model	DVI-VIDEOWALL-9X
Unit Description	9 Display Video Wall Processor
Video Format Support	HDMI, DVI, VGA, Component, S-Video, Composite (Only one Digital and one Analog can be input simultaneously)
Dual Output Support	DVI & VGA
Local Output	Yes
Video Bandwidth	DVI (Single Link 4.95Gbps) VGA (165MHz)
Supported Resolutions	Up to 1920x1200@60Hz
Audio Support	No
System Control	RS-232 / RS-485
Cascadable	Yes
Input TMDS Signal	1.2 Volts (peak-to-peak)
Input DDC Signal	5 Volts (peak-to-peak, TTL)
ESD Protection	- Human body model — ±15kV (air-gap discharge) & ±8kV (contact discharge) - Core chipset — ±8kV
Input Connectors	DVI x 1 S-Video x 1 RS232 x 1 RS485 x 1
Output Connectors	DVI x 9
HDMI Input Selection	Push Button / IR Remote / RS232 Push Button / IR Remote
RCA Connector	75Ω female
DVI Connector	DVI-I (29-pin female, digital only)
RJ45 Connector	WE/SS 8P8C with 2 LED indicators
RS232 Connector	DE-9 (9-pin D-sub Female)
Dimensions (L x W x H)	22" x 17" x 3.5"
Power Supply	AC Power 100~240V
Power Consumption	60 Watt (max)
Environmental	
Operating Temperature	32° ~ 104°F (0° to 40°C)
Storage Temperature	-4° ~ 140°F (-20° ~ 60°C)
Relative Humidity	20~90% RH (no condensation)

Notice

1. *If the DVI or HDMI device requires the EDID information, please use EDID Reader/Writer to retrieve and provide DVI/HDMI EDID information.*
2. *All HDMI over CAT5 transmission distances are measured using Belden 1583A CAT5e 125MHz LAN cable and ASTRODESIGN Video Signal Generator VG-859C.3*
3. *The transmission length is largely affected by the type of LAN cables, the type of HDMI sources, and the type of HDMI display. The testing result shows solid LAN cables (usually in bulk cable 300m or 1000ft form) can transmit a lot longer signals than stranded LAN cables (usually in patch cord form). Shielded STP cables are better suit than unshielded UTP cables. A solid UTP CAT5e cable shows longer transmission length than stranded STP CAT6 cable. For long extension users, solid LAN cables are your only choice.*
4. *EIA/TIA-568-B termination (T568B) for LAN cables is recommended for better performance.*
5. *To reduce the interference among the unshielded twisted pairs of wires in LAN cable, you can use shielded LAN cables to improve EMI problems, which is worsen in long transmission.*
6. *Because the quality of the LAN cables has the major effects in how long transmission distance will be made and how good is the received display, the actual transmission length is subject to your LAN cables. For resolution greater than 1080i or 1280x1024, a CAT6 cable is recommended.*
7. *If your HDMI display has multiple HDMI inputs, it is found that the first HDMI input [HDMI input #1] generally can produce better transmission performance among all HDMI inputs.*



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