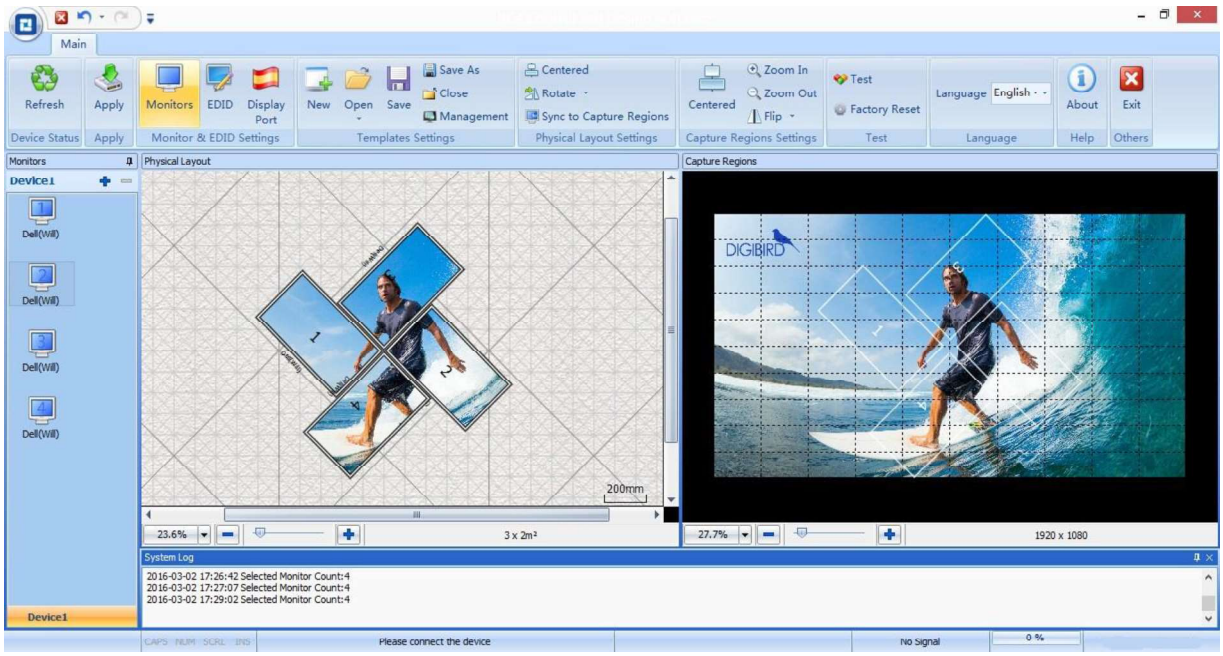
Software User Guide

DB-VRC Series

4K Video Wall Controller

11-AUG-2016



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Important Notices

Thank you for purchasing this DigiBird® product. This manual includes detailed instructions for software operation. Please refer to this manual or contact DigiBird if you have any questions. DigiBird reserves the right to make changes in the hardware, software, packaging, and any accompanying documentation without prior written notice.

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Safety Precautions

To prevent damage to your DigiBird product occurred from not appropriate operation of the equipment, please read the safety precautions prior to operation.

1) Make sure your PC configuration meets the minimum requirements indicated in this manual.
2) Make sure the operating system is compatible with the requirements indicated in this manual. See section 2.1 for details.
3) Make sure your operating system is safe, stable and free of viruses.
4) Close other running applications when installing this software.

Notifications

The following notifications are used in this guide:

ATTENTION: Attention indicates a situation that may damage or destroy the product or associated equipment.

NOTE: A note draws attention to important information.

1 Introduction

This section gives an overview of the user guide and features of the DB-VRC SERIES Video Wall Controller and Control & Design Software. Topics include:

- About this Guide
- About the DB-VRC SERIES
- Key Features of the DB-VRC SERIES Video Wall Controller
- Technical Specifications of the DB-VRC SERIES
- About the Software

1.1 About this Guide

This guide provides detailed information about the DB-VRC SERIES Control and Design Software, including software installation and configuration. The features and functionality described in this guide are based on version* 2.9.7 of the DB-VRC SERIES Control and Design Software with DB-VRC SERIES firmware version 1.0.0.0 and later. Please contact DigiBird for the latest details on firmware and software. (All products are shipped with the latest software available, unless stated otherwise. Special requirements may be organized by contacting DigiBird sales team via sales@digibirdtech.com)

1.2 About the DB-VRC SERIES Video Wall Controller

The DigiBird DB-VRC SERIES Video Wall Controller is the simplest and most cost-effective solution to build an eye-catching and creative video wall, capable to support 1° or 45° increments rotation of display devices, with widely applications like retail stores, shopping malls, restaurants, sport bars, hotel lobbies, trade shows and entertainment venues.

1.3 Key Features of the DB-VRC SERIES Video Wall Controller

• Supports 1°, 45° and/or 90° rotation of displays
• One unit controls up to 4 displays of different size and resolution
• Cascade multiple units to build large scale video walls
• Auto bezel compensation
• Horizontal and vertical mirroring/flip
• Ultra high input resolution up to 3840x 2160 @30Hz or 4088x 4088 @18Hz
• Output resolution up to 1920x 1200 @60Hz
• 1x Single/ Dual-link DVI input port and 4x DVI-I output ports (45° increments, Order #: DB-VRC4D)
•1x HDMI1.4 input port, 1x loopout and 4x HDMI1.3 output ports (45° increments, Order #: DB-VRC4H)
• 1x HDMI1.4 input port, 1x loopout and 4x HDMI1.3 output ports (1° increments, Order #: DB-VRC4H-360F)
• Sync I/O port to ensure synchronization (Order #: DB-VRC4H; DB-VRC4H-360F)
• Supports arbitrary cropping

- Flexible EDID management
- Windows XP, Windows 7®, Windows 8®, and Windows 10® compatible.

1.4 Technical Specifications for the DB-VRC SERIES

	DB-VRC4D	DB-VRC4H	DB-VRC4H360F
Input			
Input Connectors	1x Single-Link or Dual-Link DVI-I female	1x HDMI 1.4	1x HDMI 1.4
Input Resolution	Up to 4088x4088 18Hz	Up to 3840x2160 30Hz	Up to 3840x2160 30Hz
Input Clock Rate	330M Hz	300M Hz	300M Hz
Input Bandwidth	9.9 Gbps	10.2 Gbps	10.2 Gbps
Input/output Sync	×	√	√
Output			
Output Connectors	4x Single-Link DVI or analog RGB	4x HDMI 1.3 type A; 1x HDMI 1.4 Loopout	4x HDMI 1.3 type A; 1x HDMI 1.4 Loopout
Output Resolution	Up to 1920x1200 60Hz	Up to 1920x1200 60Hz	Up to 1920x1200 60Hz
Display sizes	Different display size for each output channel	Different display size for each output channel	Different display size for each output channel
Overlap	√	√	√
Loop through	×	√	√
Power			
Power	Input: 110-240V AC; Output: 12V DC Rate: max. 40W	Input: 110-240V AC; Output: 12V DC Rate: max. 20W	Input: 110-240V AC; Output: 12V DC Rate: max. 20W
Features			
Rotation	45°, 90°, 135°, 180°, 225°, 270° or 315°	45°, 90°, 135°, 180°, 225°, 270° or 315°	0~360°,1° increments rotation
Arbitrary Upscalling	√	√	√
EDID Management	√	√	√
Bezel Compensation	√	√	√
Cropping	√	√	√
Flipping	√	√	√
Cascading	√	√	√
Control			
Control	USB-B Connector; USB 2.0	USB-B Connector; USB 2.0	USB-B Connector; USB 2.0
Software	Windows based GUI software	Windows based GUI software	Windows based GUI software
Environmental			
Operating Humidity	90% non-condensing	90% non-condensing	90% non-condensing
Operating Temperature	32° to 104° F (0° to 40°C)	32° to 104° F (0° to 40°C)	32° to 104° F (0° to 40°C)
Mechanical			
Net Dimensions	1.75"H x 8.86"W x 8.66"D (44.5mm x 225mm x 220mm) without rack mount ears 1.75"H x 10.24"W x 8.66"D (44.5mm x 260mm x 220mm) with rack mount ears	1.75"H x 8.38"W x 8.11"D (44.5mm x 213mm x 206mm) without rack mount ears 1.75"H x 9.76"W x 8.11"D (44.5mm x 248mm x 206mm) with rack mount ears	1.75"H x 8.38"W x 8.11"D (44.5mm x 213mm x 206mm) without rack mount ears 1.75"H x 9.76"W x 8.11"D (44.5mm x 248mm x 206mm) with rack mount ears
Package Dimensions	3.74"H x 17.72"W x 12.20"D (95mm x 450mm x 310mm)	3.74"H x 17.72"W x 12.20"D (95mm x 450mm x 310mm)	3.74"H x 17.72"W x 12.20"D (95mm x 450mm x 310mm)
Net Component Weight	2.78 lbs (1.26 Kg)	1.76 lbs (0.8 Kg)	1.76 lbs (0.8 Kg)
Shipping Weight	6.33 lbs (2.87 Kg)	5.30 lbs (2.4 Kg)	5.30 lbs (2.4 Kg)

1.4.1 Front and Rear Panel

DB-VRC4D

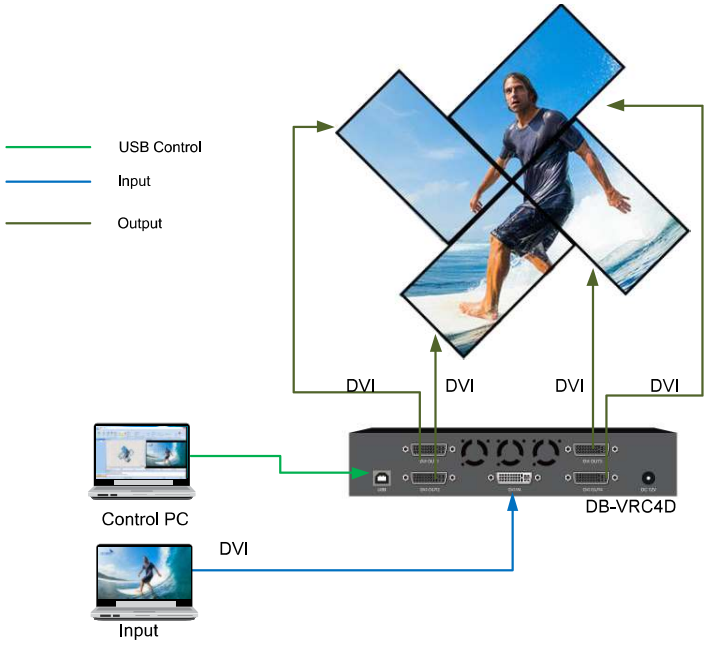
1: Indicators (Input LED, Status LED and Power LED)
2: Dual-link DVI input port (Signal or dual-link DVI-D female connector)
3-6: DVI Outputs (4x Single-link DVI or Analog Dual-link DVI connector)
7: USB Control (Compatible with USB 1.0 and 2.0)
8: Power Supply (12V, 5Amps)

DB-VRC4H or DB-VRC4H-360F
*NOTE: The two models have the same appearance with the rear panel but different with front panel.

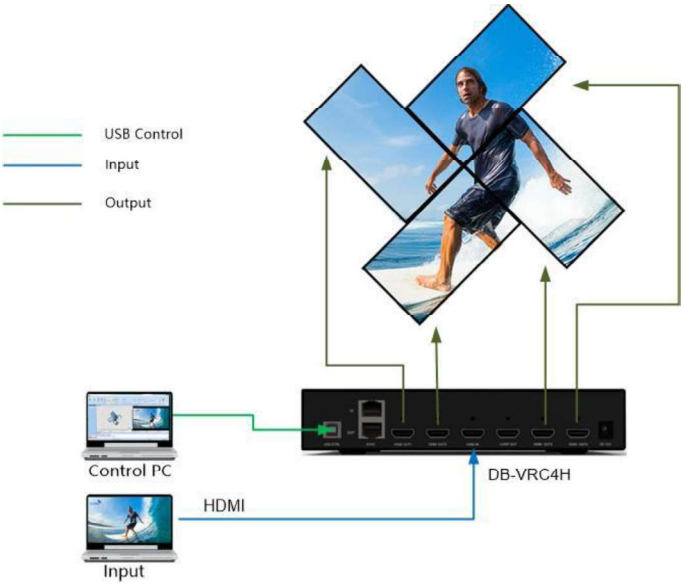
1: Indicators (Input LED, Status LED and Power LED)
2: HDMI 1.4 Input
3-6: HDMI 1.3 Output
7: HDMI Loop Out
8: Sync in
9: Sync out
10: USB Control
11: Power supply

1.4.2 Application Diagram

DB-VRC4D



DB-VRC4H or DB-VRC4H-360F



1.5 About the DB-VRC SERIES Control and Design Software

The DB-VRC SERIES Control and Design Software is a Microsoft® Windows®-based application that is used to control the DB-VRC SERIES Video Wall Controller from your computer via a USB cable.

Some features of the DB-VRC SERIES Control and Design Software include:

- The user interface is organized into a series of tasks so that you can easily navigate through them and set up the video wall.
- Supports quick setup. Once the dimension and position of the monitors are set up, the software is able to calculate the display area automatically.
- The monitors in the physical layout and the white frames in the capture regions can be moved by using up ↑, down↓, left ←and right→ arrows on the keyboard.
- The DB-VRC SERIES Control and Design Software provides a monitor database, and most well-known manufacturers are already included at launch. It also allows users to add their own monitors.
- Monitor information such as screen dimensions (in pixels and millimeters), bezel sizes and refresh rates are all included.
- Supports arbitrary cropping of input sources and supports previewing of cropped regions.
- A virtual canvas provides a screen layout (physical layout) for the video wall where monitors can be positioned and rotated.
- Custom video wall configurations can be saved as templates for future recall.
- Input source (video/image) can be imported to the capture region for previewing of the display.

1.6 Computer System Requirements

To ensure the software running smoothly and reliably, it must be installed on a computer that meets or exceeds the following criteria:

Item	Minimum	Recommended
Operating System	Windows® XP 32-bit and 64-bit versions	Windows® 7 32/64-bit, Windows® 8 32/64-bit
CPU	Intel® Pentium®/Celeron®/AMD Athlon™	Intel® Core™ i3 or above
Memory (RAM)	256MB RAM	2GB RAM or above
Hard Disk Free Space	150MB	5G or above
Graphics	1024 x 768, 65K colors	1024 x 768, 16.7M colors
CD-ROM	DVD-ROM	DVD-ROM
Input	Microsoft compatible keyboard and mouse	Microsoft compatible keyboard and mouse

2 Software: Installing and Uninstalling

2.1 Installing the Software

The Control and Design Software installation file is provided on a CD with your DB-VRC SERIES (it is also available for download from the DigiBird website at www.digibirdtech.com). Install the program on your computer by following the instructions of Setup Wizard.

2.2 Uninstalling the Software

The software uninstall steps are illustrated below:

1. Open the Start Menu by clicking the Start button and then click "All Programs" → " RC4 Control and Design Software" → "Uninstall", as shown:

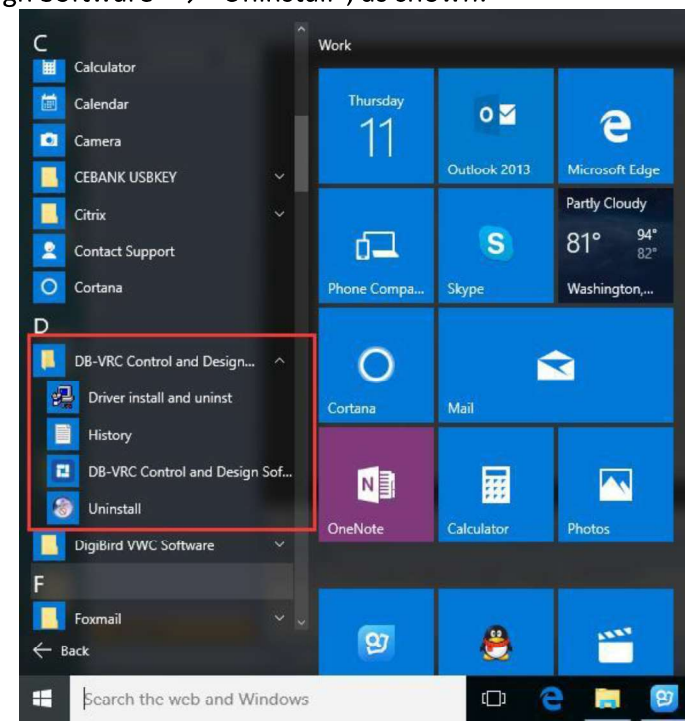


Figure 2.2 Uninstallation

2. Follow the instructions on the Uninstall Wizard to complete uninstallation.

3 Software Operation

3.1 Software Overview

Prior to setup of the positions of monitors and capture regions, the user needs to be conversant with the software. The DigiBird DB-VRC SERIES Control and Design Software application window contains the following elements:

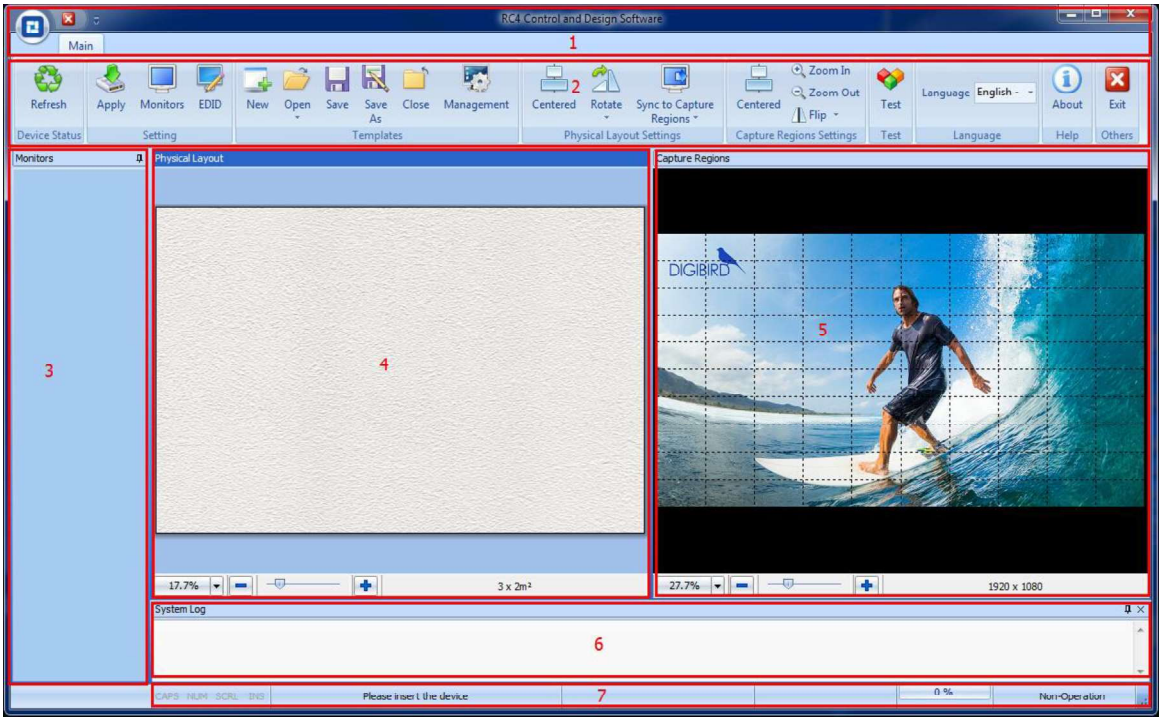


Figure 3.1.1 Software Overview

① Menu Bar: includes Start Menu and Customized Toolbars.

② Toolbars: includes Configuration Templates, Physical Layout Settings, Capture Regions Settings, Test, Help and Others.

③ Monitor List Window: the monitors list will be presented here after completing the Monitors Settings. The trade names and models of the selected monitors will be displayed in the list. The Monitor Listing window can be docked or undocked. Look for the small pushpin in the title bar of the Monitor Listing window and click it so that the pin is pointing to the left, as shown in the figure below. The window will now automatically hide itself when it is not being used.

Figure 3.1.2 Monitor list

④ Physical Layout Window: The background of the Physical Layout Window serves as the virtual area where video wall monitors will be mounted or placed. The monitors in the Physical Layout window can be dragged and rotated in the custom designing of the video wall.
⑤ Capture Regions Window: The input signal (image or video) will appear here. The input signal can be cropped and flipped in the Capture Regions window.
⑥ System Log Window: The system events will be displayed in the System Log window.
⑦ Status Bar: Includes Device ID, prompt message and input Resolution, etc.

3.2 Mounting Wall Size Setting

Before setting the Mounting Wall dimension, users should understand what a Mounting Wall is. The Mounting Wall is the physical area where monitors will be mounted, or placed. (Figure 3.4).

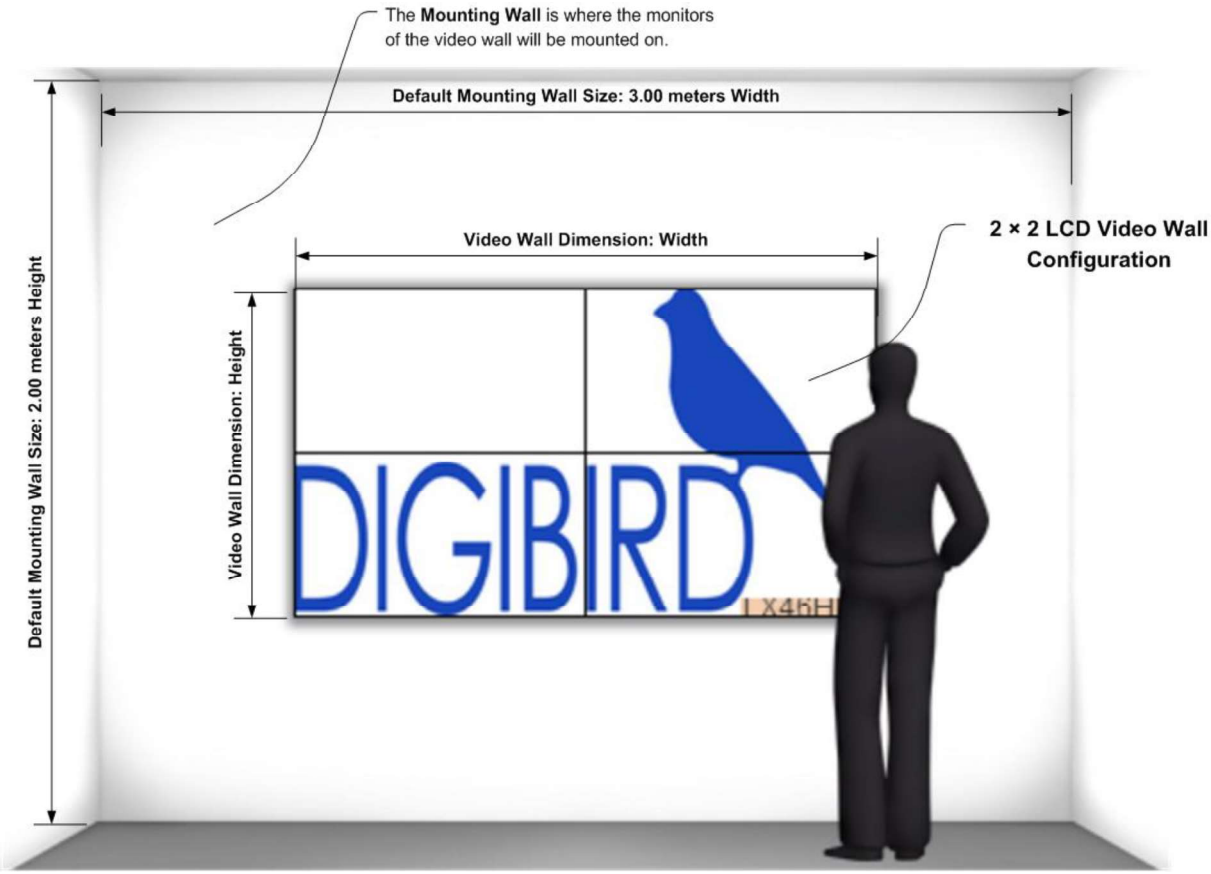


Figure 3.2.1 Mounting Wall

The default Mounting Wall dimension is 3.00 meters width by 2.00 meters height. Users are able to resize Mounting Wall by hovering the mouse cursor over the Physical Layout Window, and right-click on the window background to select “Mounting Wall Size”.

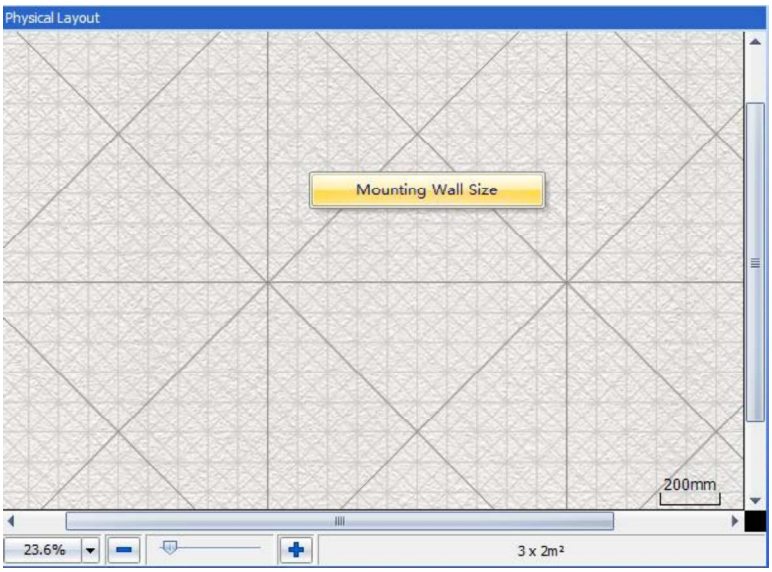


Figure 3.2.2

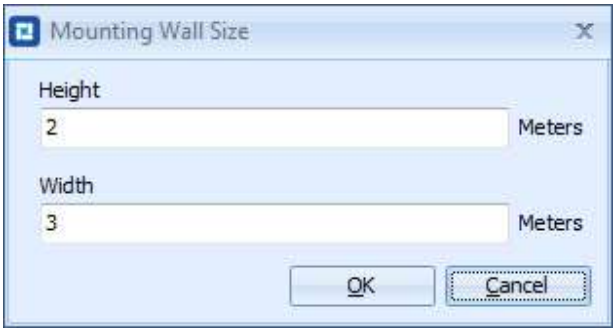


Figure 3.2.3

3.3 Input Resolution Settings

The default input resolution is 1920 × 1080 @60Hz. The user can change this default by selecting the Input Resolution Settings menu.

Hover your mouse cursor over the background image of the Capture Regions Window, and then right-click on the background. The Input Resolution Settings menu will appear.

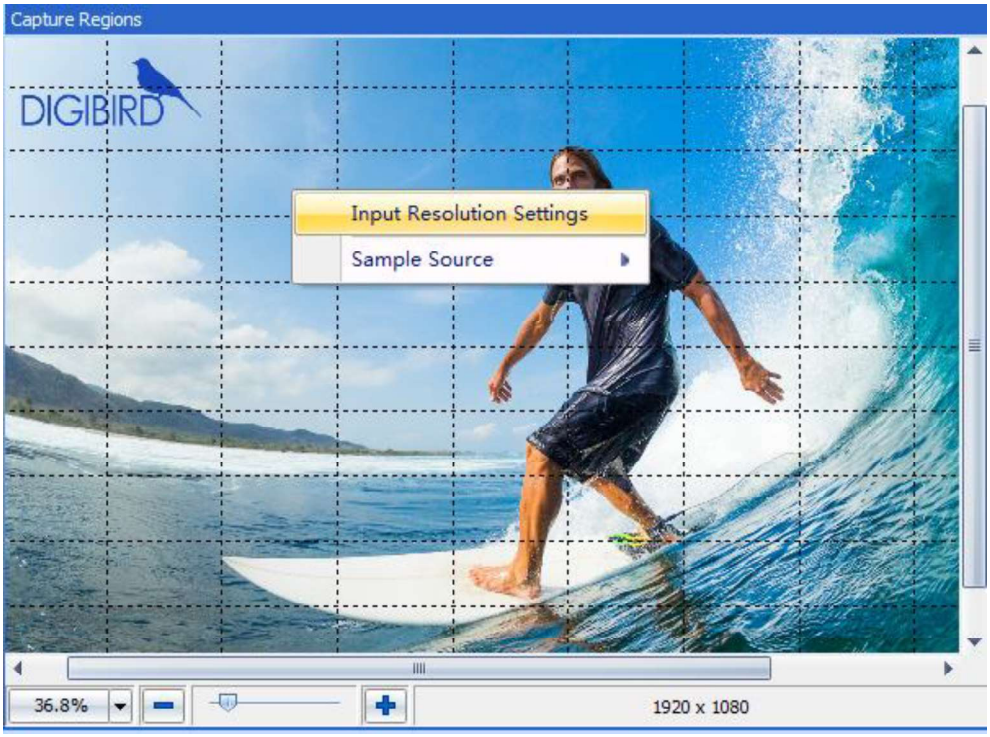


Figure 3.3.1

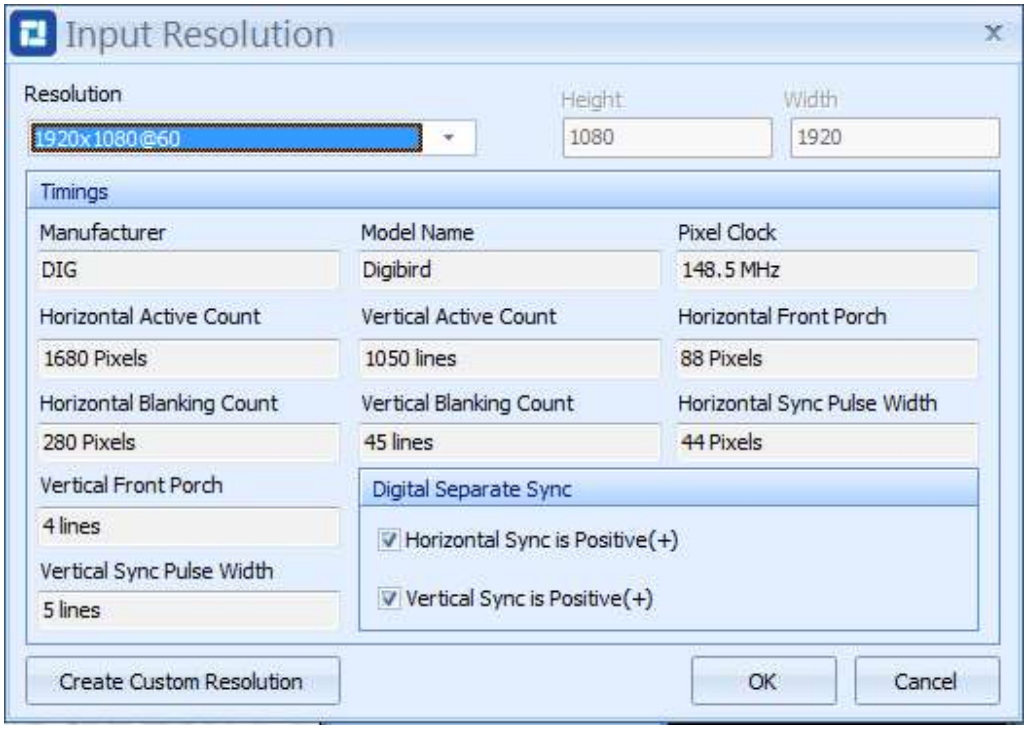


Figure 3.3.2

Click the drop-down menu at the top left of the Input Resolution window and then select the desired input resolution, or you can select "Custom" at the bottom of the list to create a custom resolution.

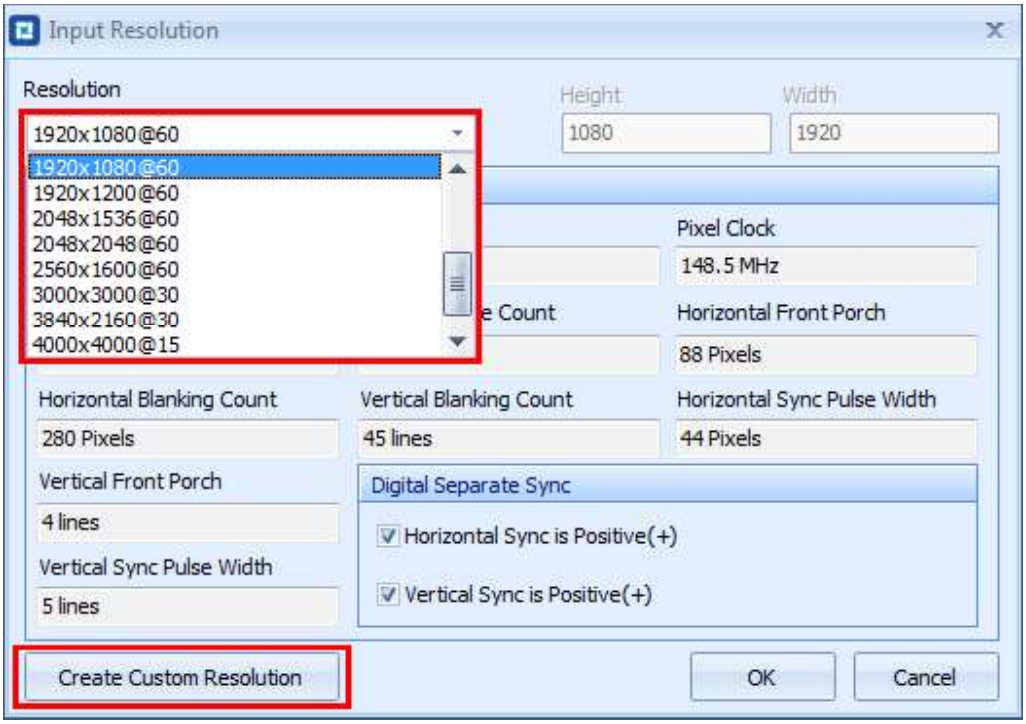


Figure 3.3.3

3.4 Monitor Settings

DigiBird's DB-VRC SERIES Control and Design Software provides a monitor database, including the most of common manufacturers and models.
If failed to find wanted monitors in the list, users can add new monitors.

3.4.1 Monitor Selection

In the Toolbar window, click the "Monitors" icon to open the "Monitors" setting window, as shown in the figures below:

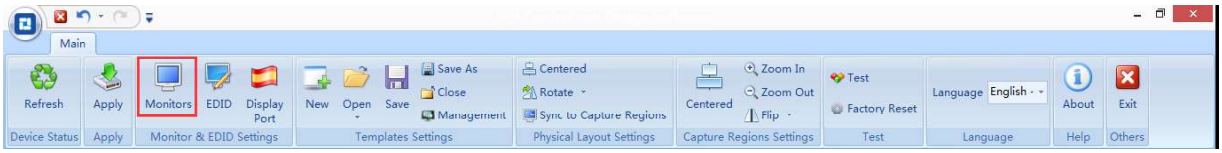


Figure 3.4.1A

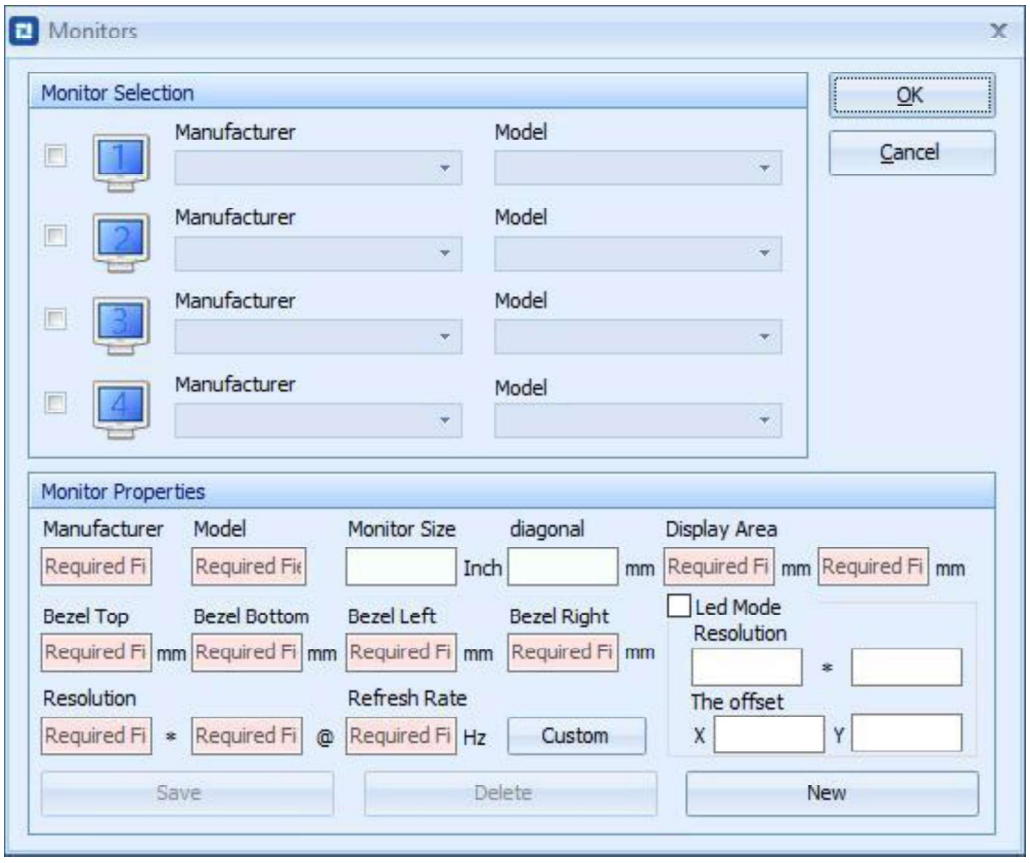


Figure 3.4.1B

Click the check boxes at the left of the Monitors setting window to add the monitors being used. Select the Manufacturer and Models dropdown lists to choose a specific, listed monitor. Refer to the following figures for reference:

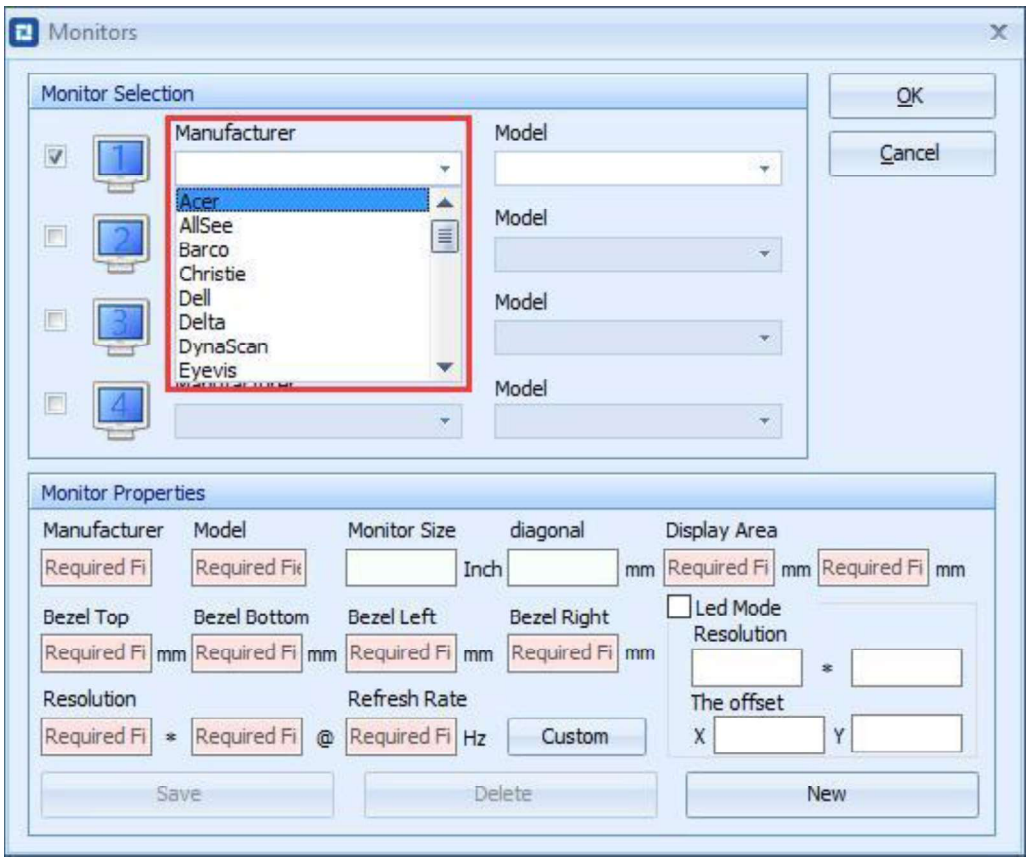


Figure 3.4.1C Manufacturer Dropdown List

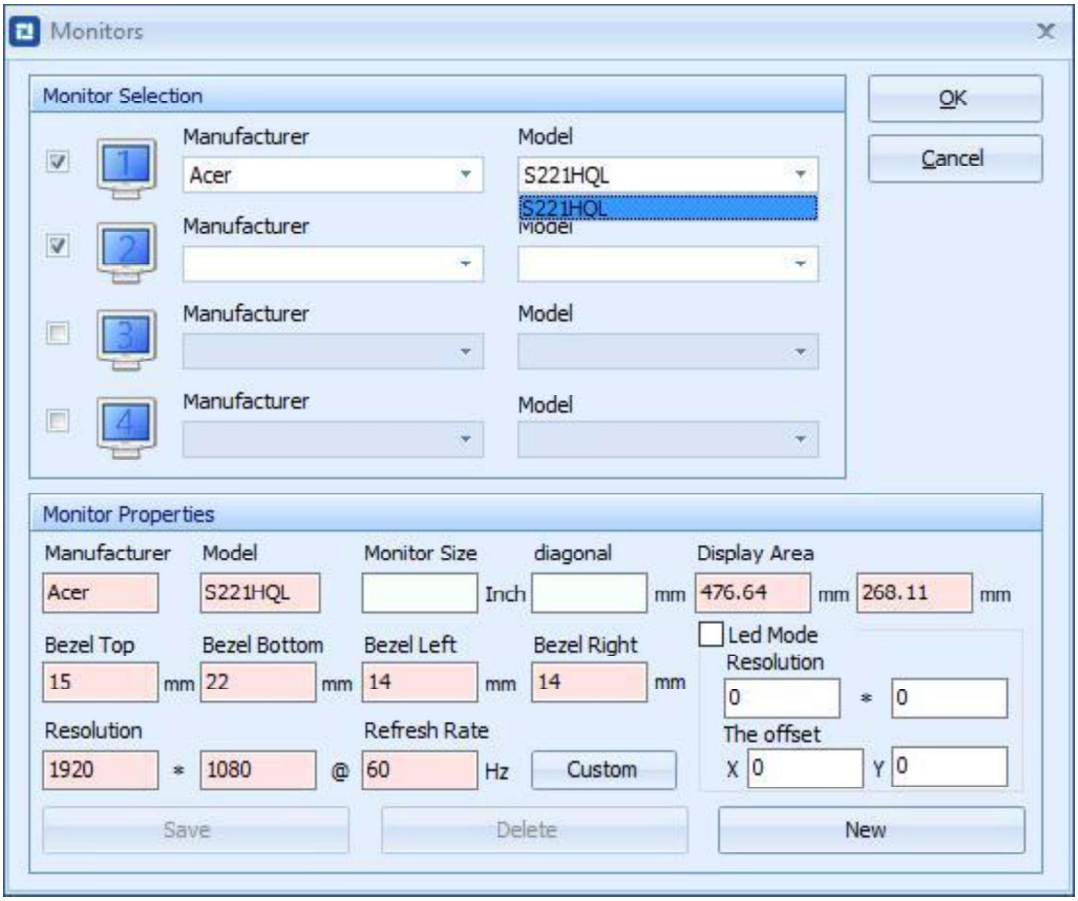


Figure 3.4.1D Models Dropdown List

After the manufacturer and model selection, data will appear in the Monitor Properties window. The Monitor Properties are a group of specifications that are required by the software to ensure the device is configured correctly. The Monitor Properties include the following information: Manufacturer, Model, Display Area, Resolution, Refresh Rate, Top Bezel, Bottom Bezel, Left Bezel and Right Bezel.

3.4.2 Adding New Monitors

If failed to find wanted monitor in the database, you can manually add the desired monitors by filling in the required fields.

After filling in the required values, click “Save” and new monitor will appear in the manufacturer and models dropdown list, as shown in the figure below:

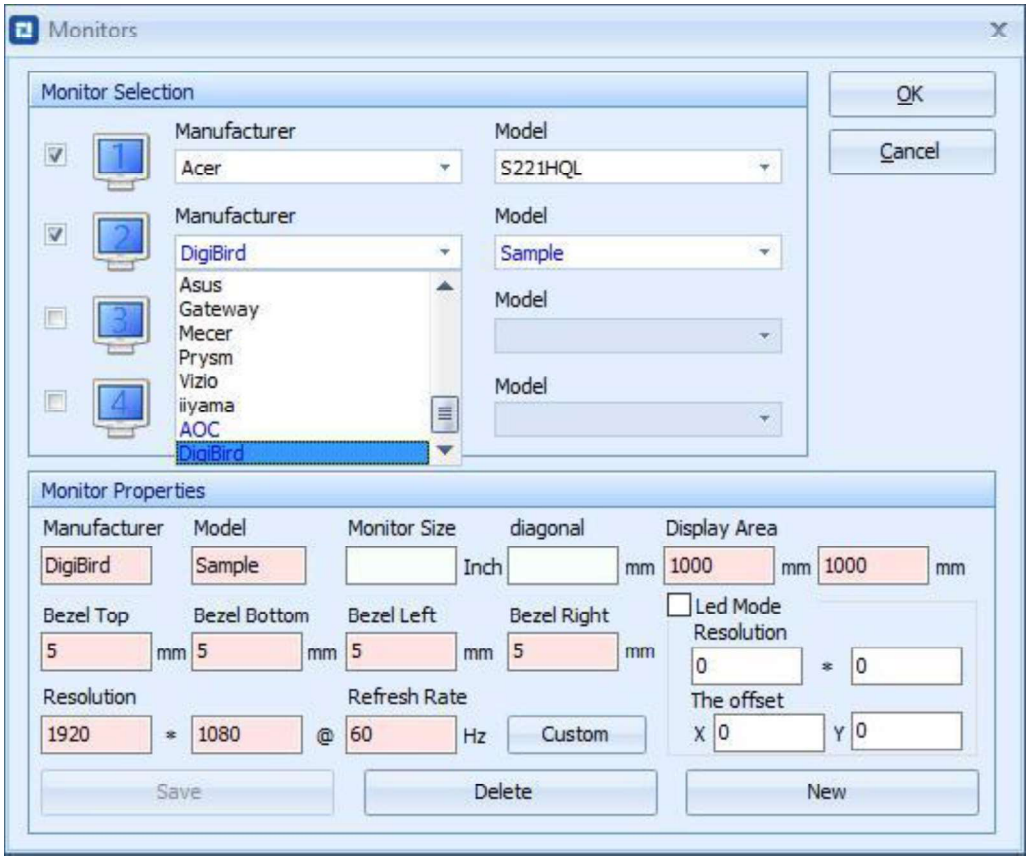


Figure 3.4.2 Add New Monitors

NOTE: It is very important that the specifications of the monitors are accurate so as to ensure the capture regions are calculated correctly.

3.4.3 Delete a Custom Monitor

Select the custom manufacturer and model and click the Delete button. The custom monitor will be deleted from the monitor database, as shown in the figure below:

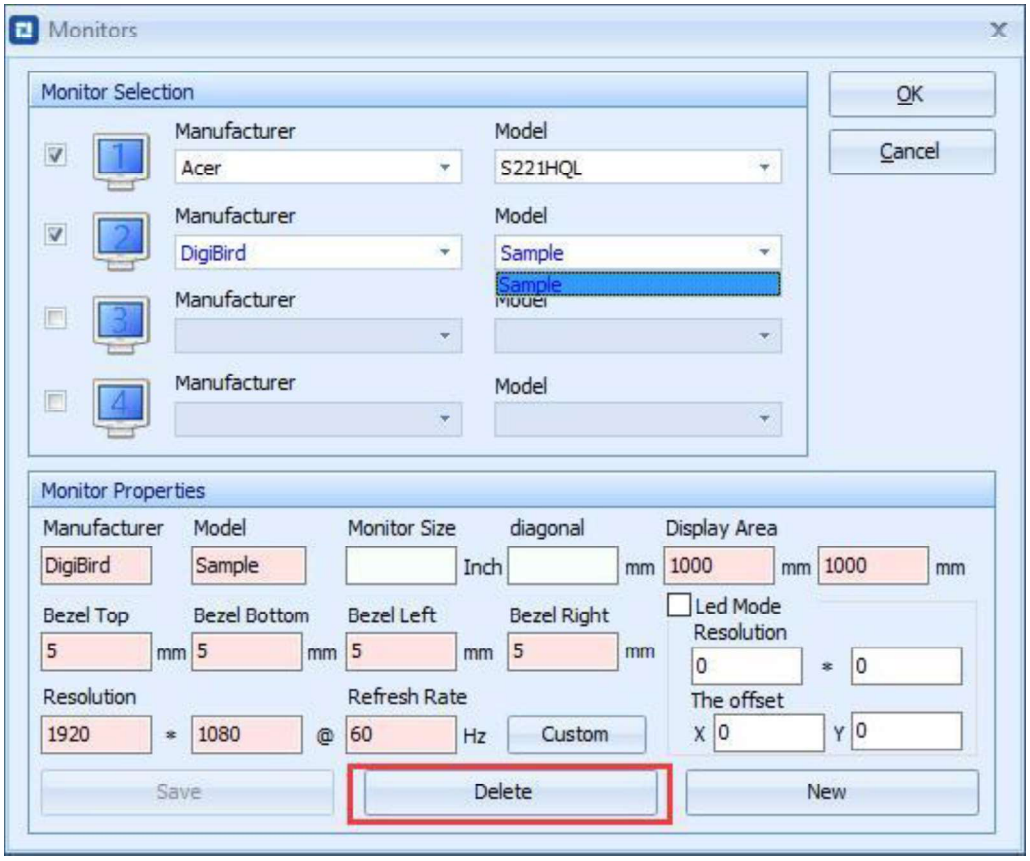


Figure 3.4.3

3.5 Physical Layout Design and Settings

Once the desired models have been selected and displayed in the Monitor Listing window, the user can proceed to the Physical Layout window and Capture Regions window to design a creative video wall. The Physical Layout window will display the physical position of the monitors with numbers (1, 2, 3 and 4) for cross-referencing.

Select a monitor, user can drag the monitor to preferred position or right click to select rotation angles to make the layout.
Right click on a monitor to bring up the context menu. This allows you to change its rotation or to sync the operation to the Capture Regions, as shown in the figures below.

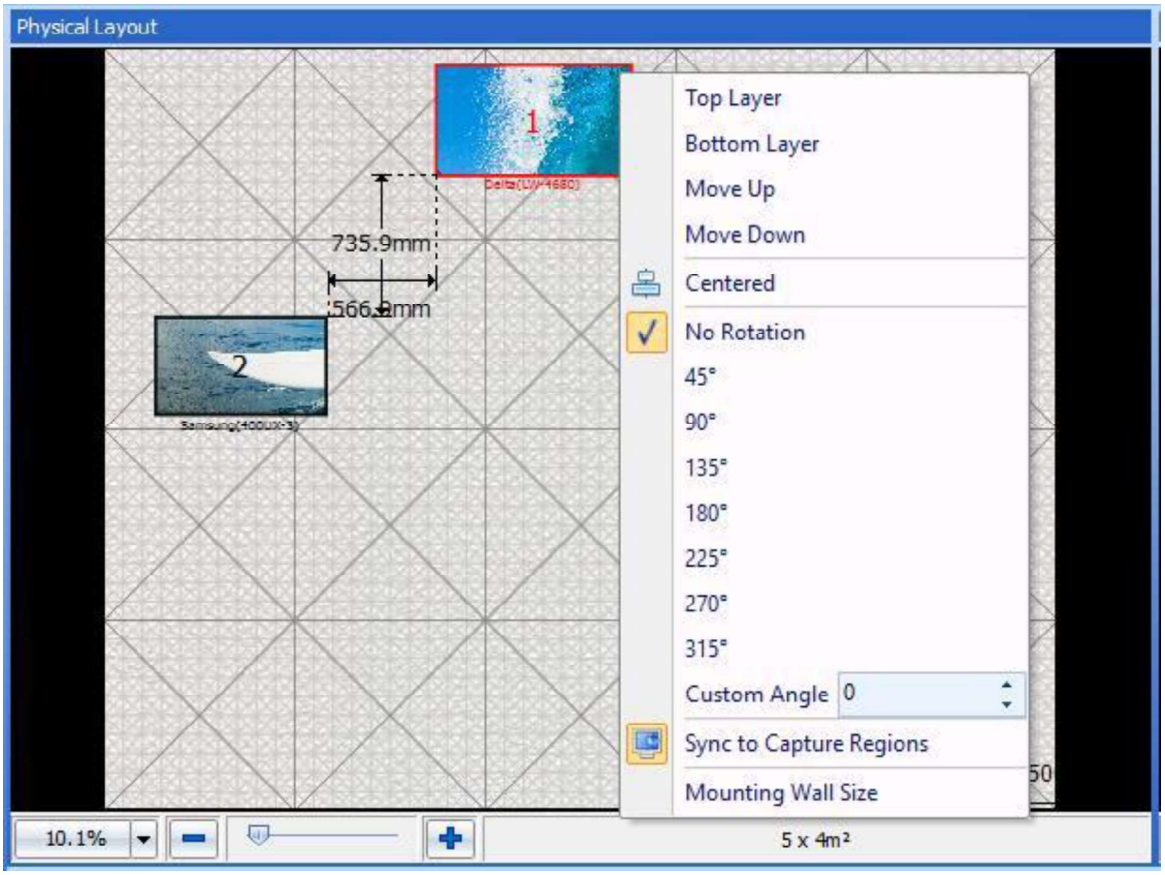


Figure 3.5A

NOTE:

1. After selecting a monitor, the user can use arrow keys to move the monitor one pixel at a time.
2. Use the Ctrl key + arrow key to move the monitor ten pixels at a time.
3. The methods of alteration for the display proportion include: (see Figure 3.5B):
   - Choose from the drop down list
   - Left-click the slider in the zoom bar and drag it to the left to zoom out; drag to the right to zoom in
   - Sliding the mouse wheel
   - Using the col-resize or row-resize cursor
4. *NOTE: The Custom Angle option is the settings for the DB-VRC4H-360F, and this button only appear when connected with the DB-VRC4H-360F hardware.

Figure 3.5B

3.5.1 Toolbar for Physical Layout Setting

The Toolbar for the Physical Layout includes three icons: "Centered", "Rotate" and" Sync to Capture Regions".

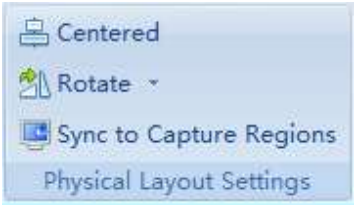


Figure 3.5.1

3.5.2 Centered Icon

When clicking the Centered icon, the group of monitors will be placed in the middle of the Mounting Wall.

3.5.3 Rotate Icon

When clicking the “Rotate” icon, a drop down list will appear. The user can choose the desired rotation angle from the drop down list.

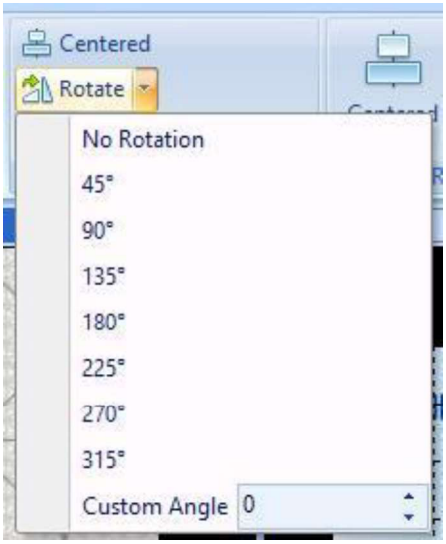


Figure 3.5.3

3.5.4 Sync to Capture Regions Icon

The Sync to Capture Regions function allows the software to automatically calculate the pixel size and position of the capture regions in the input source or the background picture according to the actual physical size and position of the monitors on the mounting-wall.

Right clicking on the Physical Layout window will make the context menu appear, which includes the following options: Centered, Sync to Capture Regions and Mounting Wall Size options.

3.6 Capture Regions Settings

The Capture Regions serves to distribute which part of input resource will display on individual physical video wall.

3.6.1 Zooming of Capture Regions Window

Use the following methods to zoom in or out the Capture Regions window:

- Choose from the drop down list (Figure 3.6.1A)
- Left-click the slider in the zoom bar, and drag it to the left to zoom out and to the right to zoom in (Figure 3.6.1A)
- Slide the mouse wheel
- Use the col-resize or row-resize cursor
- Right click the blank area of the Capture Regions window, and the context menu will appear (Figure 3.6.1B)

Figure 3.6.1A

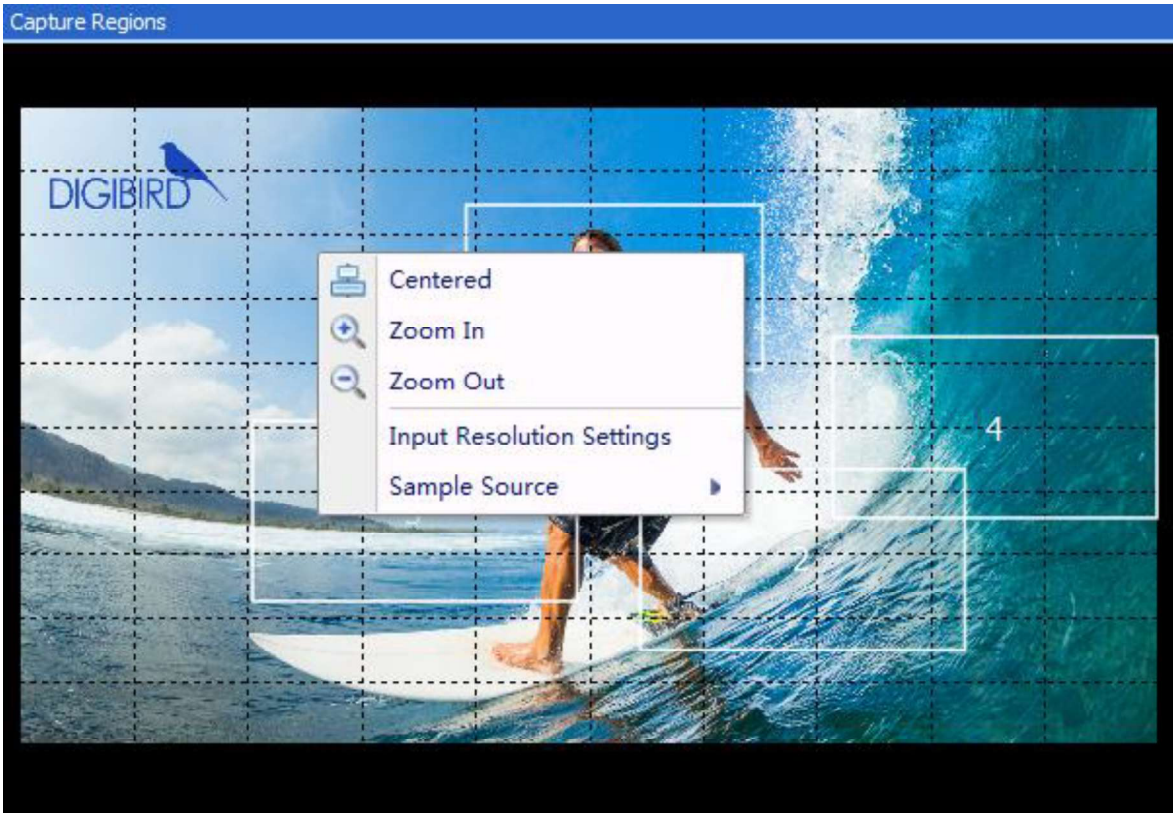


Figure 3.6.1B

3.6.2 Context Menu of the Capture Regions

Hover the mouse cursor over the capture region and right click. The context menu will appear, as shown below:

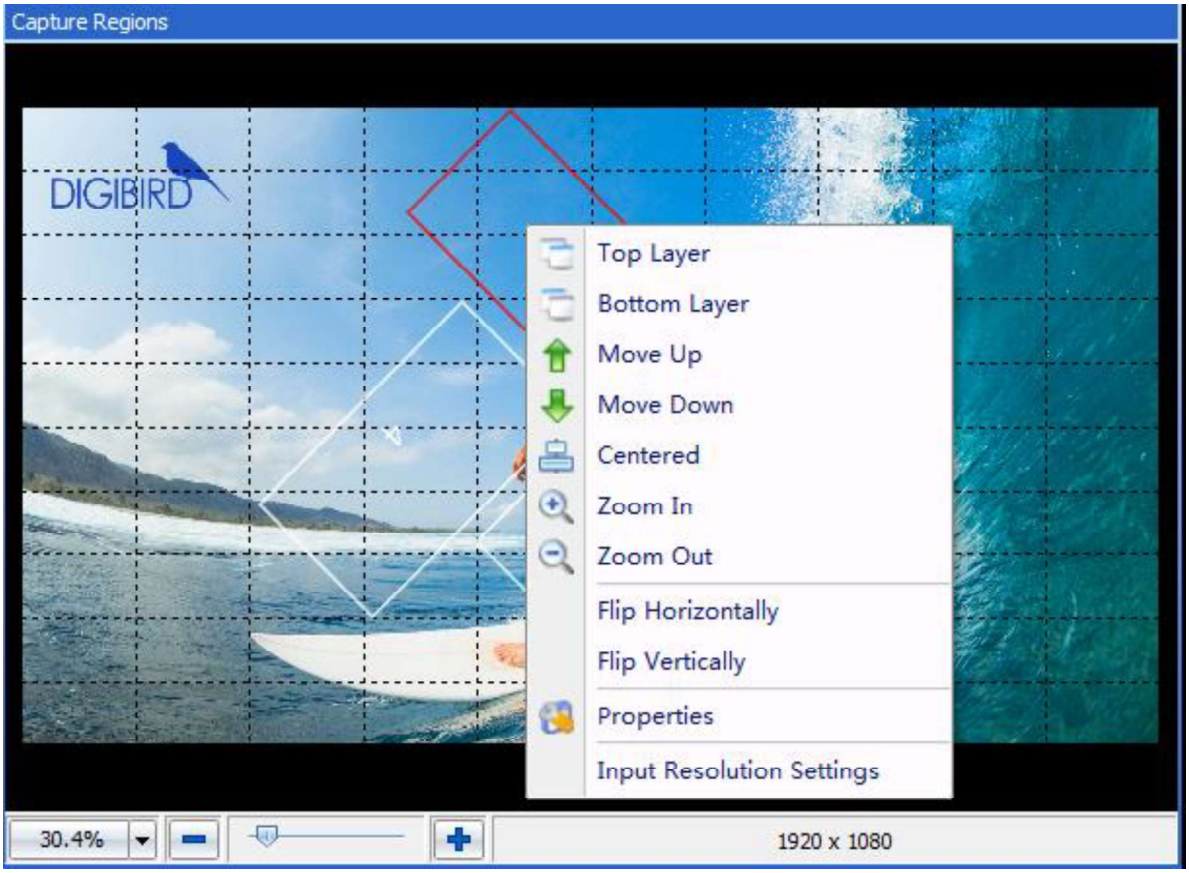


Figure 3.6.2

3.6.3 Layering the Capture Regions

When the Capture Regions overlap, they are layered. The default layer priority overlapping from bottom to top starts at monitor No. 1 at the bottom, layering sequentially to monitor No. 4 at the top. The user can change the layer priority of the capture regions by selecting Top Layer, Bottom Layer, Move Up and Move Down.

Below is an example of how to use the layering function to design a video wall:

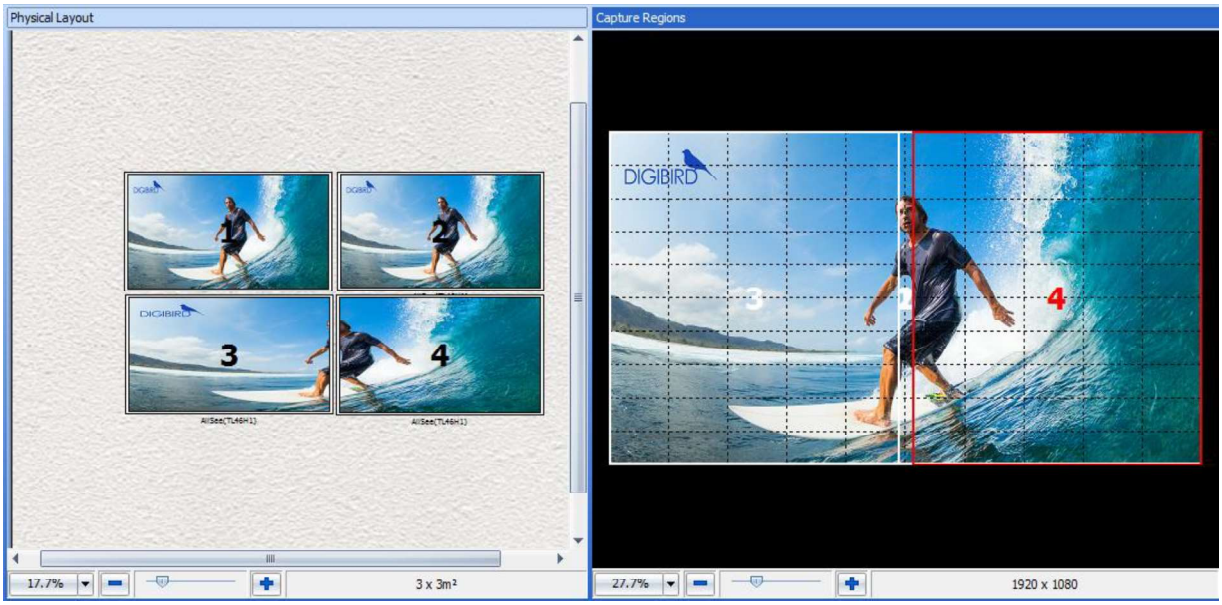


Figure 3.6.3

Monitors No. 1 and No. 2 display the entire input source on each monitor. No. 1 capture region is the bottom layer of the capture regions window.

3.6.4 Flip Horizontally or Vertically

Choose Flip Horizontally or Flip Vertically from the above context menu. The resulting display of the monitors should look like the following pictures:

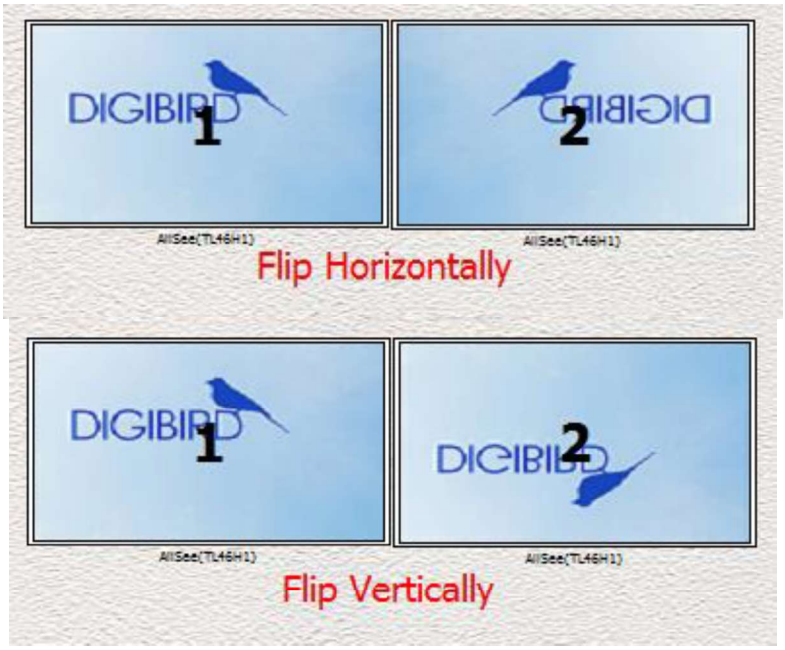


Figure 3.6.4

3.6.5 Capture Regions Properties

According to the physical position and size of the monitors, the software automatically calculates the pixel size of the Capture Regions. Related information about the Capture Regions, including Region Coordinates, Region Resolution, Region Rotation and Flip will be shown in the Capture Regions Properties box. The following figure (Figure 3.6.5) will help the user to better understand the Capture Regions properties.

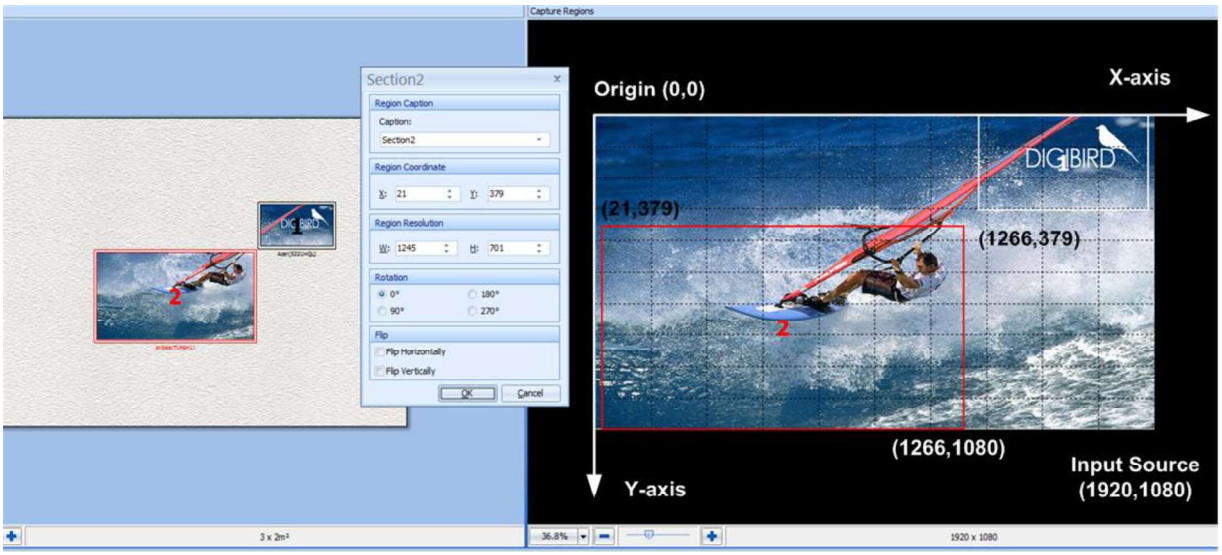


Figure 3.6.5

3.6.6 How to Calculate the Pixel Size and Position of a Capture Region

After positioning the monitors in the Physical Layout window and clicking the Sync to Capture Regions button, the software will automatically calculate how many pixels the capture region and the corresponding monitor should have. Below is a simple example to illustrate this calculation process:

Two Acer S221HQL monitors are positioned on the Mounting Wall. There is no gap between the two monitors, as shown in the following figure:

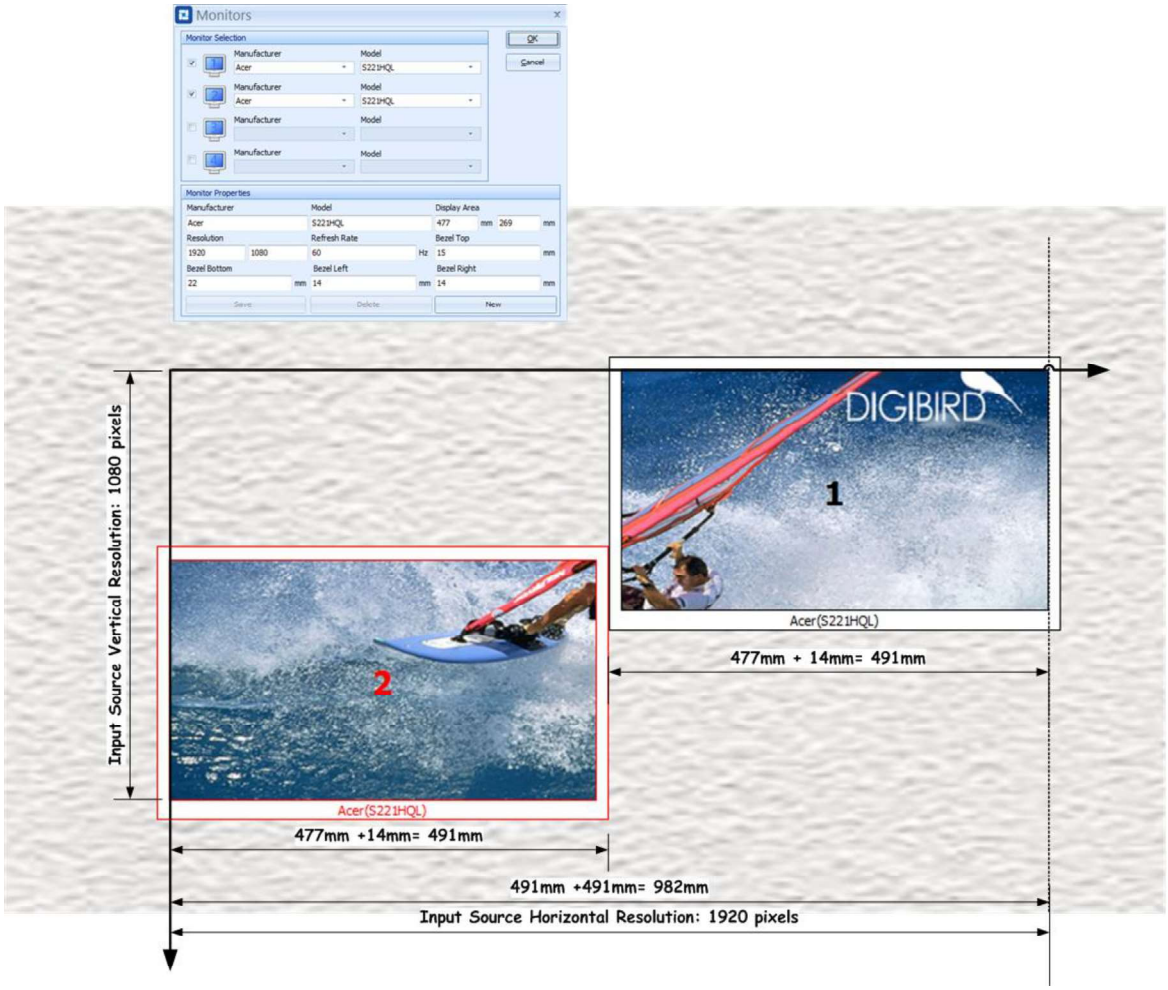


Figure 3.6.6A

First of all, calculate the physical size of the video wall in the horizontal direction. The calculating formula is shown the below:

Screen Width + Right Bezel +Left Bezel +Screen Width= 477+14+477+14= 982mm

Second, divide the horizontal resolution by the horizontal physical size to get the number of pixels per millimeter.

NOTE: The default input resolution is 1920 × 1080@60Hz.

1920 pixels/982 mm= 1.9552 pixels/mm

Third, calculate how many horizontal pixels the No. 2 monitor should have by using the following formula:

Viewable Width × 1.9552 pixels/mm= 477mm × 1.9552 pixels/mm= 932 pixels

Now we can use the Capture Regions Settings to check the calculation. Hover the mouse cursor over Region 2, right click, and the context menu will appear. Choose the "Properties" option and the Region Properties window (Section Properties) will appear. Check the Region Resolution--region two is 932 pixels wide, which is the same as the calculation.

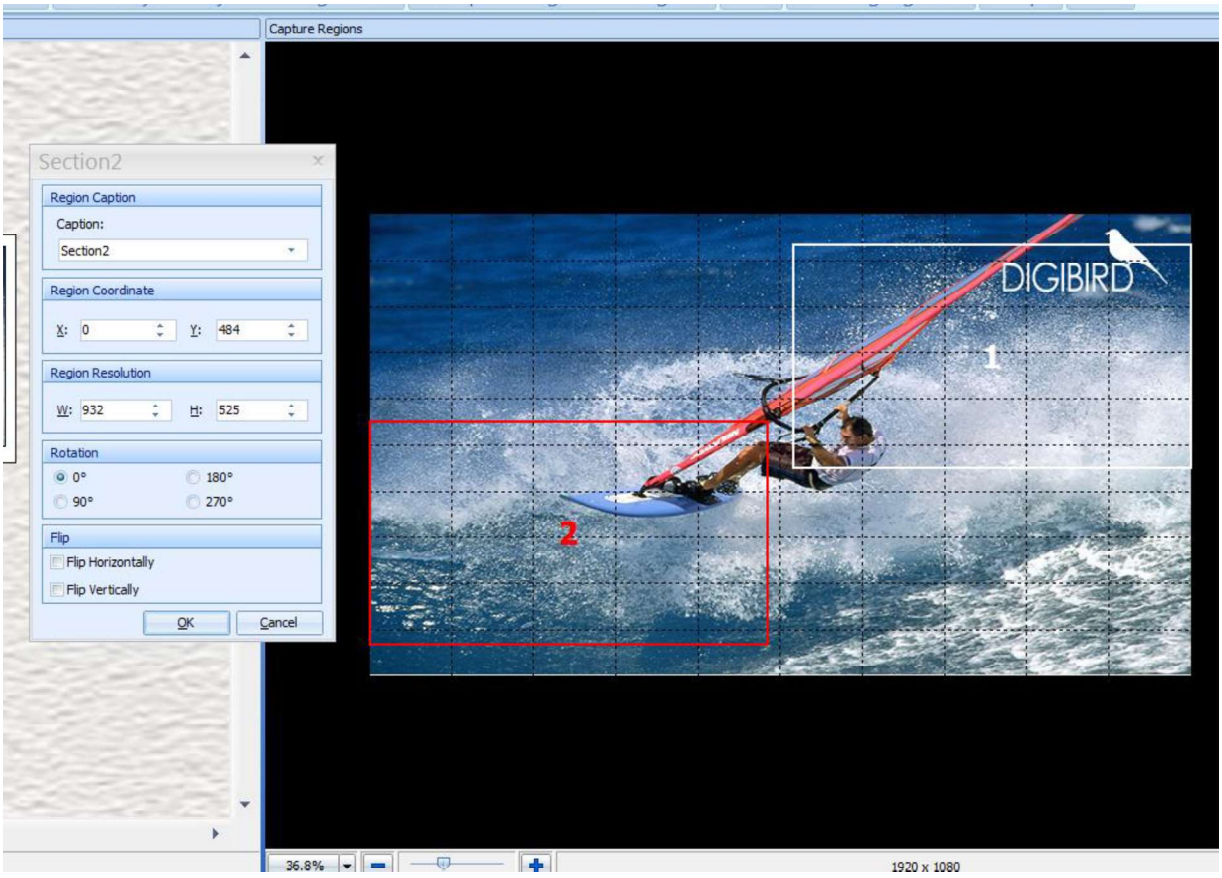


Figure 3.6.6B

3.7 Apply

After setting up the monitors and capture regions and connecting the DB-VRC SERIES hardware, click the "Apply" icon in the Toolbar. The software will send the configuration template to the device (DB-VRC SERIES hardware) and the configuration will take effect.

Figure 3.7

3.8 Refresh

Click the Refresh icon in the Toolbar to check the resolution of the connected input source. The software will detect whether the input resolution that the user set up matches the resolution of the connected input source. If it is not a match, the software will give notices to remind the user to adjust the input resolutions.

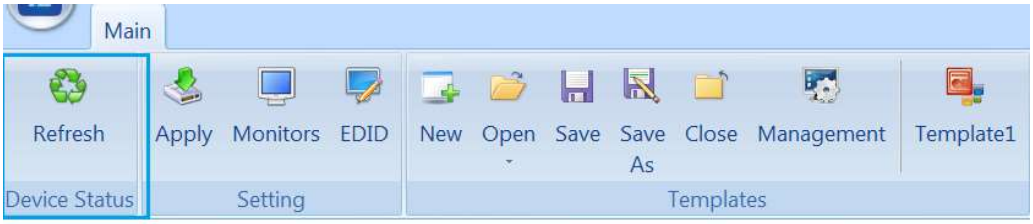


Figure 3.8

3.9 Templates Settings

The configurations of the video wall, including the position of the monitors, rotation of the monitors, input resolution, etc., can be saved as template and recalled at any time.

Press “Save” to save template.

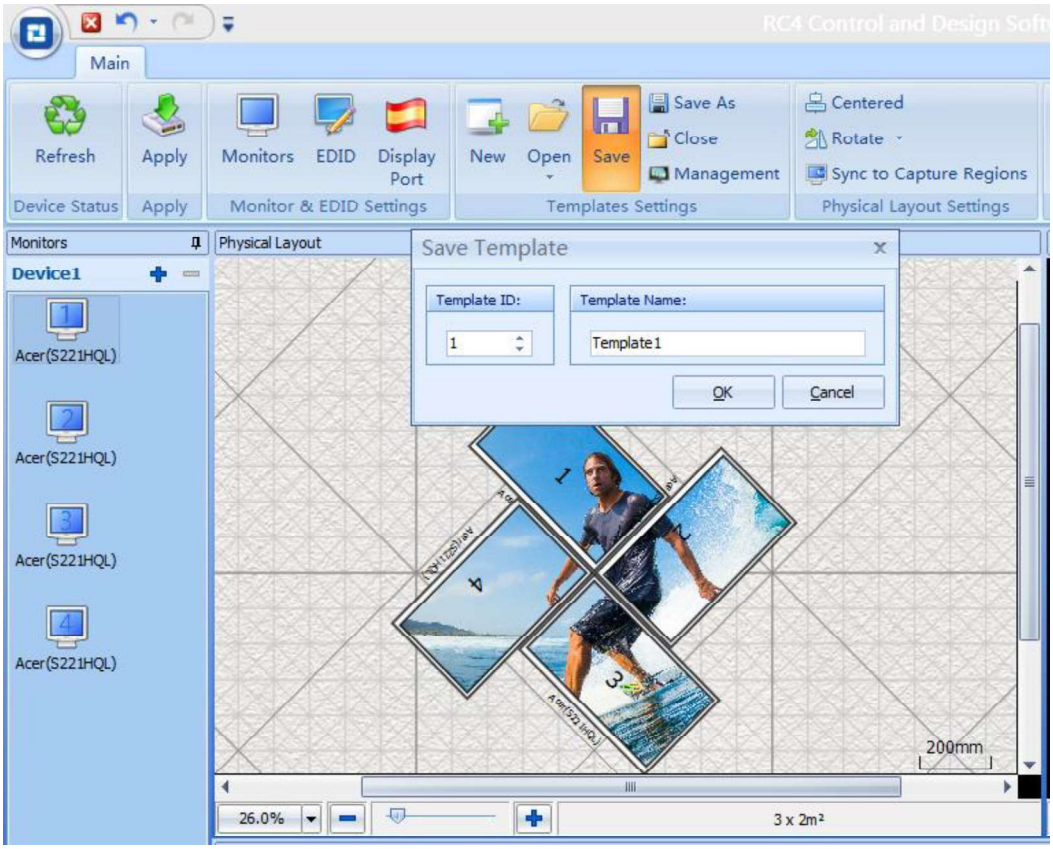


Figure 3.9.1

Press “Open” to recall saved templates.

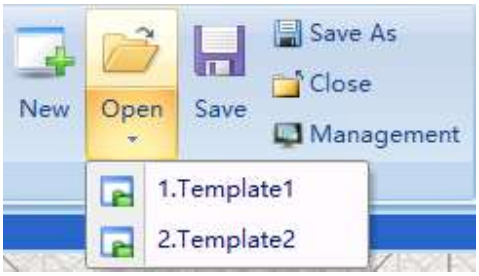


Figure 3.9.2

Press “Close” to clear all the settings of video wall.

Figure 3.9.3

Press “Management” to Add shortcut and Rename of saved template.

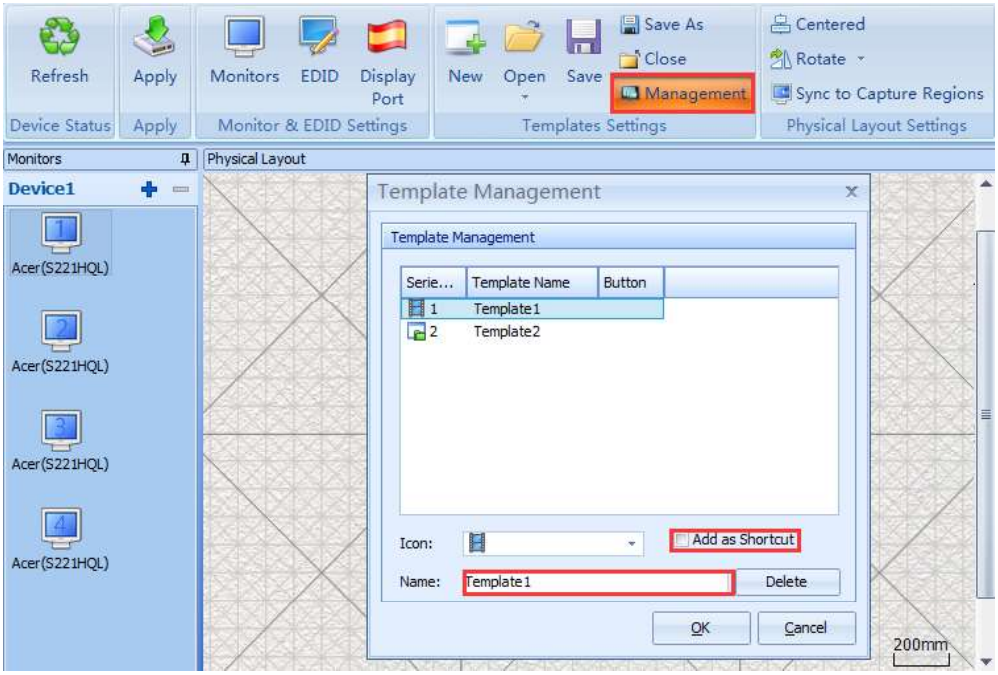


Figure 3.9.4 Template Management

3.10 EDID Management

The software supports EDID management by enabling the user to read the input EDID information and the output EDID information (Display side), and save the output EDID to the DB-VRC SERIES or perform a 'Save As', saving the EDID information to file.

Timing: Used to display the information of manufacturer name, model name, pixel clock, horizontal active count, vertical active count, horizontal front porch, horizontal blanking count, vertical blanking count, horizontal sync pulse width, vertical front porch, vertical sync pulse width, etc.

3.10.1 Read EDID

Select input or output source and click "Read EDID". The EDID properties will be displayed in the Timings box. See the example below:

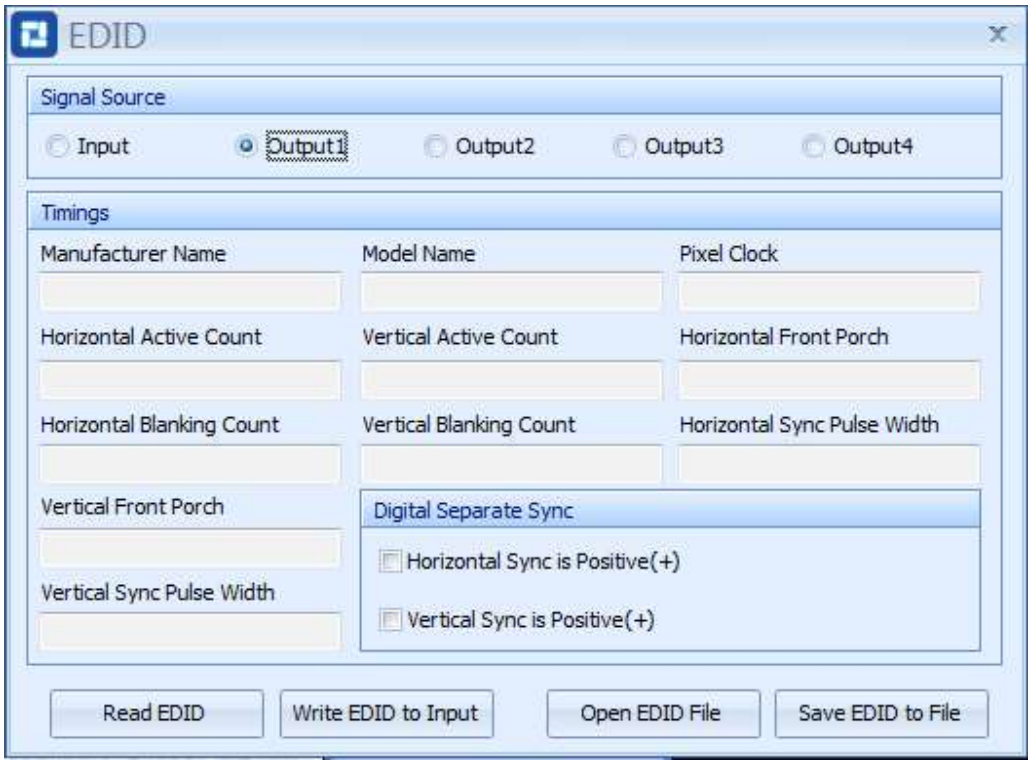


Figure 3.10.1

3.10.2 Write EDID to Input

The software supports the writing of EDID information to the input. The user needs to click the "Read EDID" button prior to writing the EDID to the input.

3.10.3 Open EDID File

Press "Open EDID File" to import the user saved EDID file.

3.11 Test

Use the Test Pattern to display color bars or grid on the physical monitors to test whether the monitors are successfully connected to the output port if the video wall controller.

Figure 3.11.1

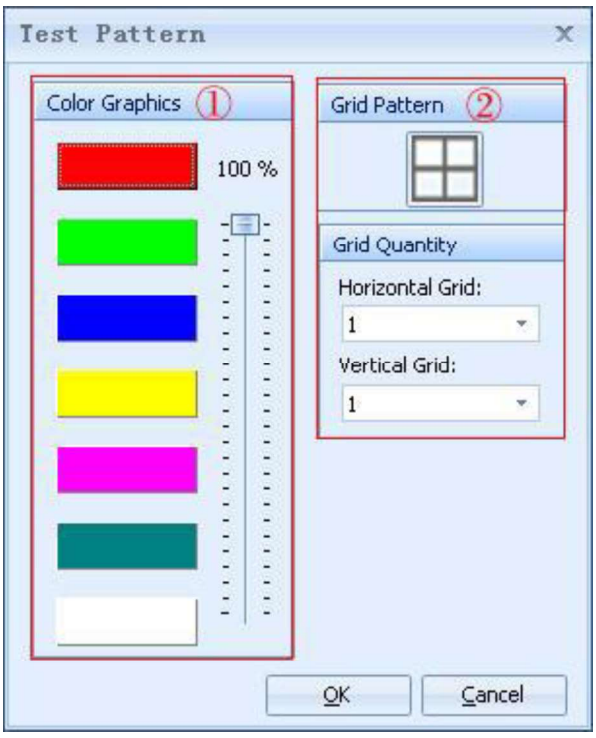


Figure 3.11.2

3.12 Language

The software is multilingual, currently supporting English, Chinese Simplified and Chinese Traditional.

Figure 3.12.1

3.13 About

Press the “About” icon to show the version and copyright information.

4 Cascading

If the video wall consists of more than 4 monitors, the users have to get multiple units for cascading, given that single unit only equipped with 4x output ports.

Press “+” icon to add more devices.

Figure 4.1.1

Physical Connection for Cascading

DB-VRC4H or DB-VRC4H-360F

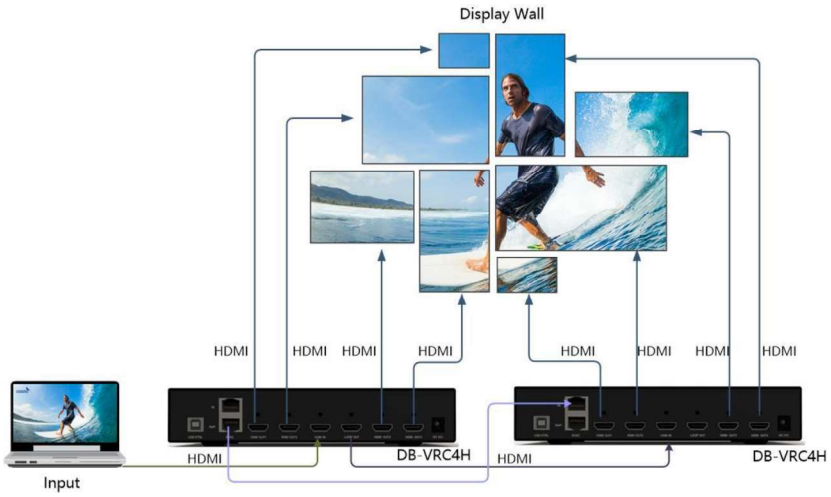


Figure 4.1.2

DB-VRC4D

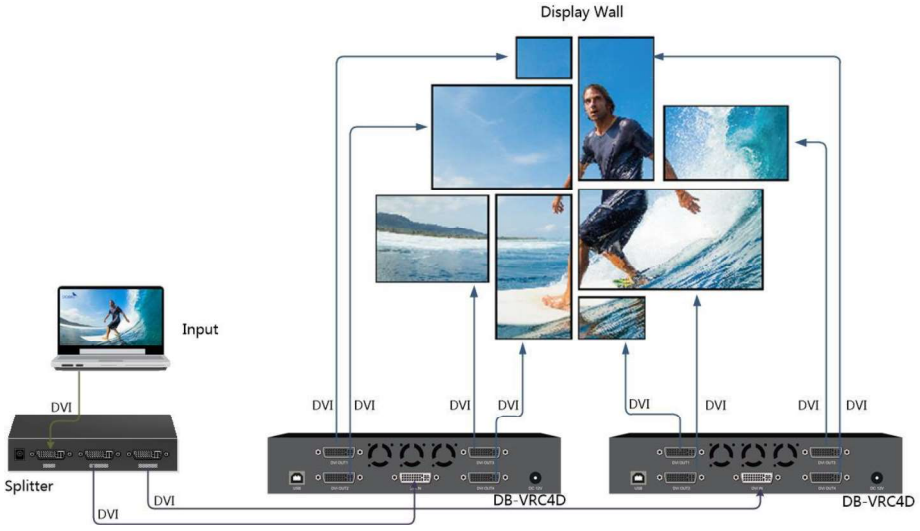


Figure 4.1.3

NOTE: Cascading of DB-VRC4D should work with extra splitter, given that there is no integrated Loop Out port on the controller.