

## DS2 User Guide

This user guide provides basic instructions for setting up SEADA DS2 Edge Blending Controller and how to create eye catching video projection screen using its management software.



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## i. Set up connection

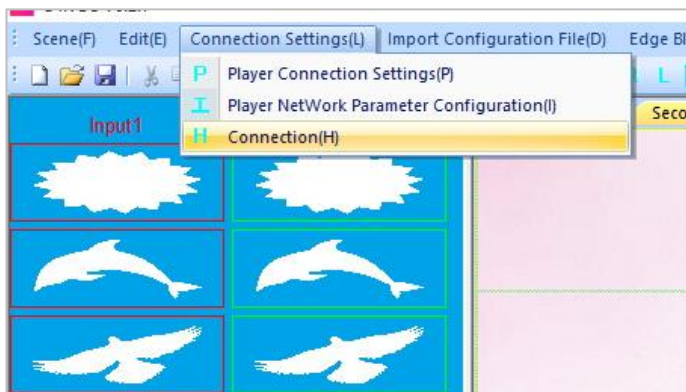
### 1. Set up the static IP address on control PC

The default IP address of DS2 is **192.168.1.136**. The control PC needs to be at the same range of controller to connect to the DS2

- Open the 'Ethernet Properties' windows on the Control PC
- Highlight the TCP/IPv4 in Networking and click the Properties button to open the TCP/IPv4 Properties window
- Change the 'Obtain an IP address automatically' to 'Use the following IP address to set up a static IP address
  - IP address: any address between **192.168.1.1** and **192.168.1.253** except the address which has been taken by the DS2
  - Subnet mask: **255.255.255.0**
  - Default Gateway: **192.168.1.254**.

2. Connect the control PC to powered up DS2 with network port. Ensure the 'LAN' port on DS2 is connected, not the 'RS232' port since both of them use RJ45 connection.

3. Open the DS2 software  and click 'Player Connection Settings' or 'P' button on toolbar to open the connection dialog box.



In this dialog box, all the DS2 units connecting to this control PC will be shown in the list. Highlight DS2 to be connected and then press '**Connect**' button to connect. A '**connected**' message will be shown once the connection is established.

### Note:

if the DS2 software can not be run on the control PC

Reason	VC++ redistribution not installed at current OS
Solution	Please download and install the 'vcredist_x86.exe' from Microsoft or contact SEADA for support

If a 'Please change your display scale to 100%' message dialog box coming up, please change scale back to 100% in control PC's Display Settings

## ii. Edge Blending Setup Procedures

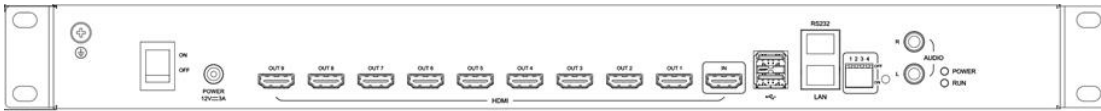
**Note:** This manual used 1x2 edge blending as an example.

### 1. Set up your projectors

Make sure the projectors cover the whole screen evenly and proper overlap is formed.

### 2. Connect DS2 to projectors and other devices

Ensure the 'LAN' port on DS2 is connected, not the 'RS232' port



### 3. Find the edge blending overlap positions on screen

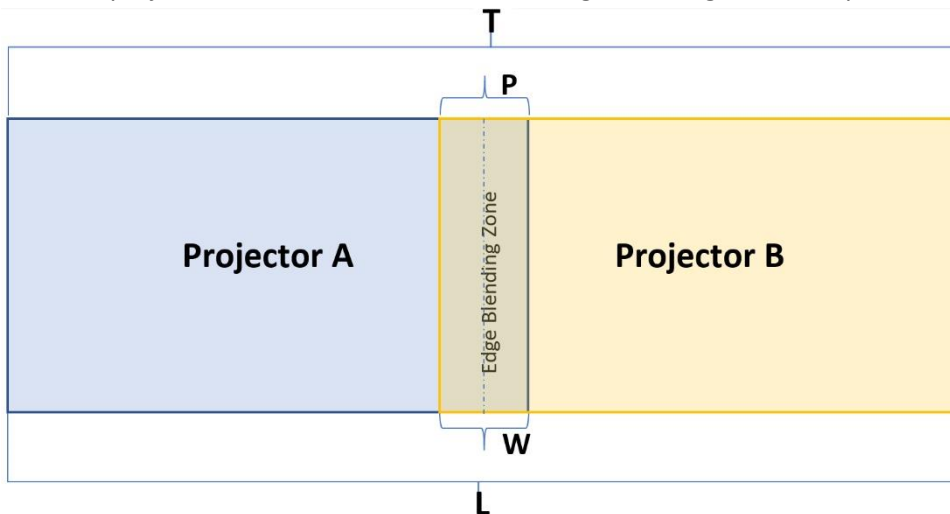
- a. Calculate the overlap width using the equation is:  $W = \frac{L * P}{T}$

W: Edge blending overlap width

T: total pixels of the projection

L: Length of the projection screen

P: edge blending area total pixels



- b. So, the right edge of projector A is  $\frac{L}{2} + \frac{W}{2}$  and the left edge of projector B is  $\frac{L}{2} - \frac{W}{2}$

- c. Example:

- i. L is 300cm
- ii. Project A and B output resolution is 1920 x 1080,
- iii. Edge blending area pixels is 240 pixels
- iv. So  $T = (1920 * 2 - 240) = 3600$  pixels
- v.  $W = (300 * 240) / 3600 = 20$ cm

Therefore, the edge positions for project B A is 0 at left and 160cm at right. The edge positions for projector B is 140cm and 300cm at right.

## 4. Edge Blending Configuration

### Step1: Parameter Settings (see detail in chapter [4.2.1](#))

Users set up the edge blending projection screen configuration here:

- Layout of the edge blending e.g. 1x2, 1x3, 2x2 and so on
- Set up the overlap zone size, default is 240 pixels

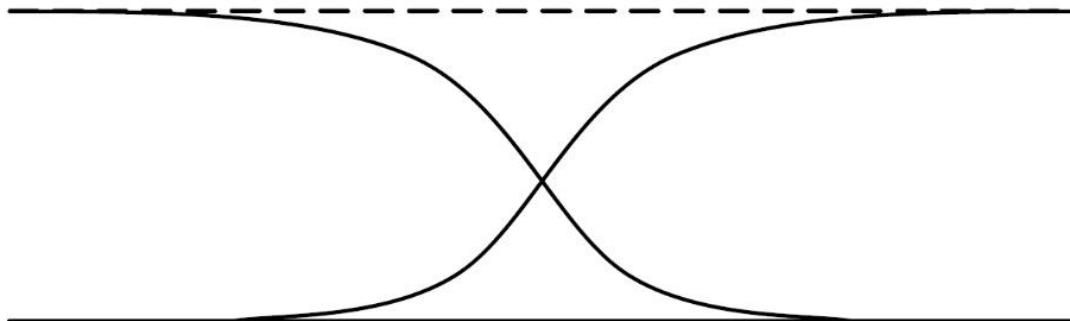
### Step2: Geometry Correction (see detail in chapter [4.2.2](#))

Geometry Correction (Image Warping) is the process of digitally manipulating image data such that the image's projection precisely matches a specific projection surface or shape. Image geometry correction compensates for the distortion created by off-axis projector or screen placement or non-flat screen surface, by applying a pre-compensating inverse distortion to that image in the digital domain. Therefore, projection can be applied onto any non-flat surfaces such as curve shape, corner walls and so on.

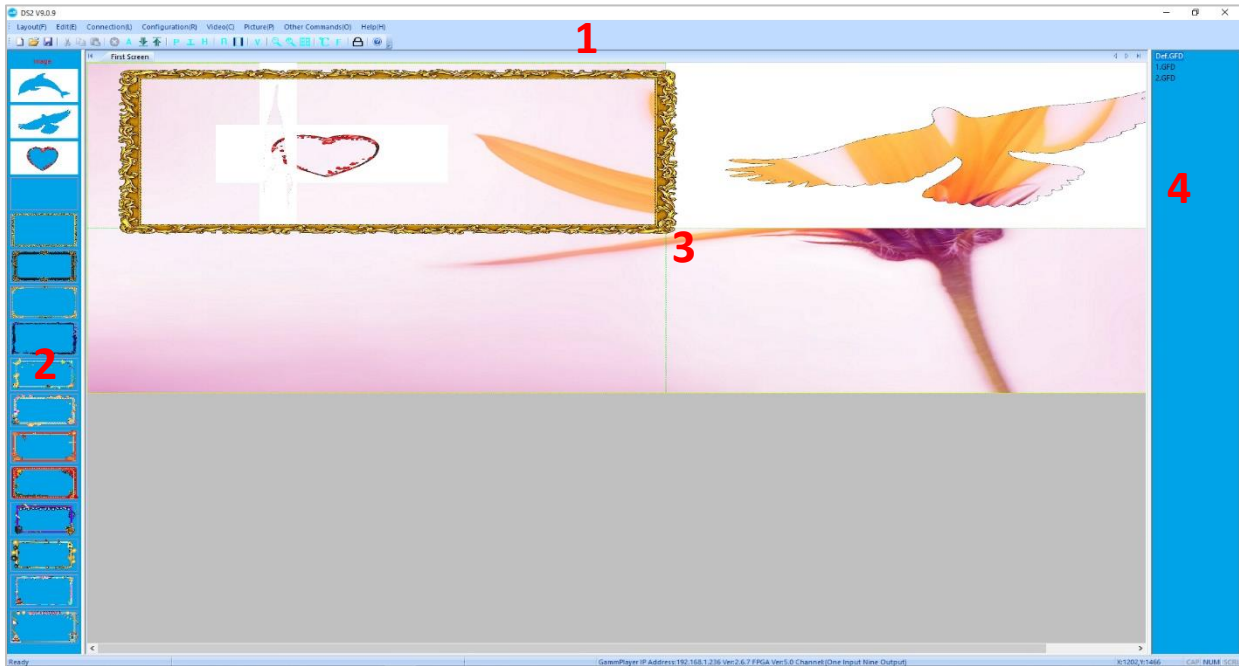
### Step3: Gamma Correction (see detail in chapter [4.2.3](#))

Because the edge blending overlapping zone will have a brighter than normal image, Gamma Correction is performed on the edges to allow seamless merging of the images together. The gamma correction is basically an S-shaped curve that is applied to gradually reduce the brightness of the image at the edge, so that they can overlap properly.

S-curves below are for left and right projectors in the edge blending zone. S-curves, when properly overlapping, will add together to result in even brightness in the edge blending zone same as the rest part of the projection screen



### iii. UI



DS2 management software provides a GUI in ribbon style for the users and enables users to interactively move, resize, position, and crop any input capture windows. The whole GUI consists of four main parts:

#### 1. Toolbar

Users can manage the DS2 units with the commands on the toolbar

#### 2. Video Input List

It lists all the different shapes of the windows for HDMI capture input. Users can drag and drop onto projection screen.

#### 3. Projection Display Area

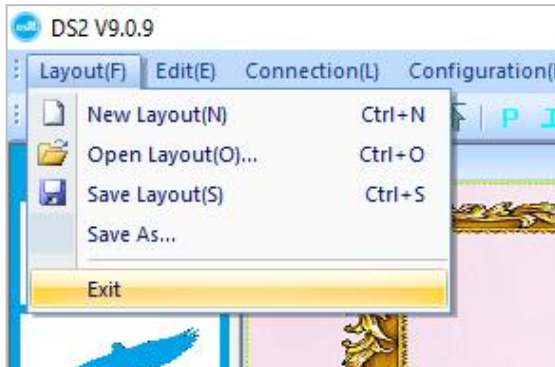
It shows the layout of current windows on projection screen and users can manage the inputs windows here via mouse

#### 4. DS2 Onboard Layout List

It shows the preset layouts on DS2. Users can load and delete the layouts here on DS2.

## iv. Operation

### 1、Layout



Users can set up the layouts for the open windows of input video from HDMI capture on the wall. The layouts will be saved onto control PC, not onto DS2 itself and the amount of the layouts can be saved are unlimited here.

#### 1.1 New Layout

Create a new blank layout

#### 1.2 Open Layout

Open an existing layout from the control PC

#### 1.3 Save Layout

Save the changes to the current layout onto control PC

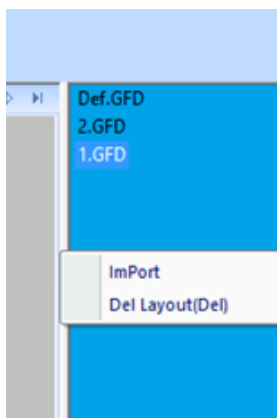
#### 1.4 Save As

Save the current layout to as different layout onto control PC

#### 1.5 Exit

Exit the software

#### 1.6 Import Layouts onto DS2



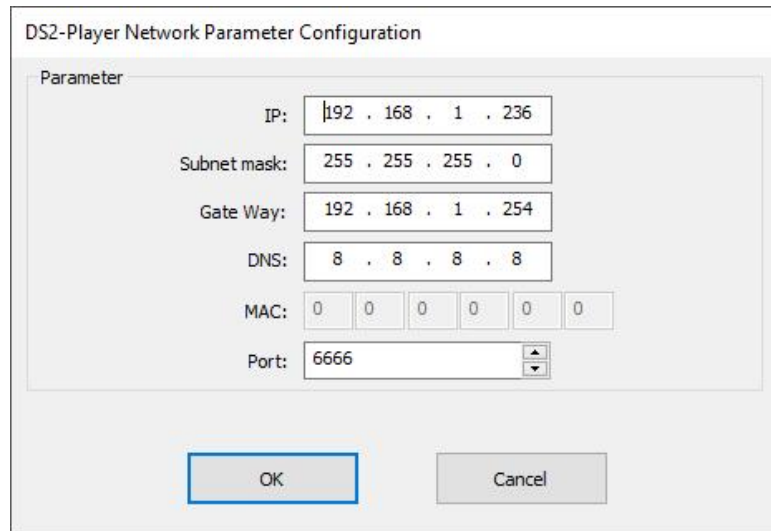
Users can load the layouts from control PC onto DS2 or delete the layouts from DS2 in this section, therefore the 3<sup>rd</sup> party controller can change the layouts using command lines. Right click on 'DS2 Onboard Layout List' area to open the dropdown menu.





### 3.2 Player Network Parameter Configuration

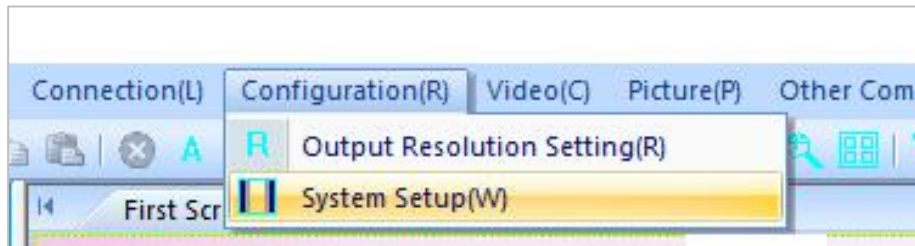
Users can change the network settings of the connected DS2 in this section.



### 3.3 Connection

Once being pressed, control PC will reconnect to the DS2 automatically.

## 4、 Configuration



### 4.1 Output Resolution Setting

Users can set up the output resolution to match the projectors to be used in the edge blending.

(1024X768@60Hz 、 1280X720@60Hz 、 1280X768@60Hz 、 1280X800@60Hz 、 1280X1024@60Hz、 1920X1080@60Hz、 1920X1200@60Hz)

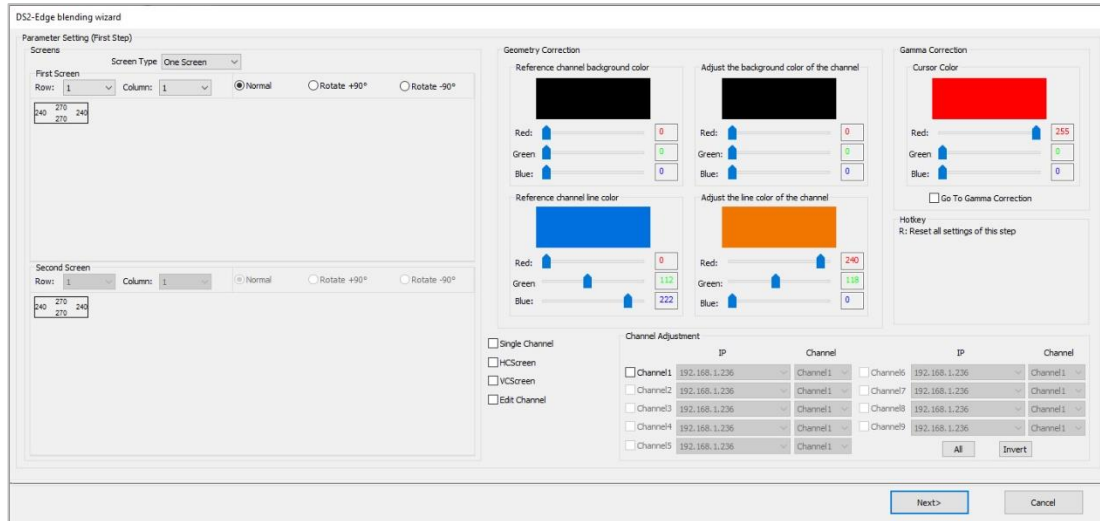
Only DS2-9H supports up to 1920 x 1200, DS2-3H only supports up to 1920 x 1080. users are also able to customize the output resolution in this section.

## 4.2 System Setup

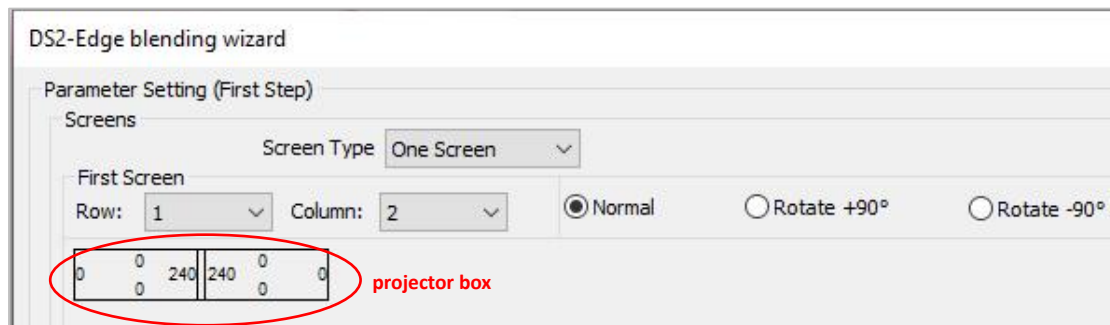
Users set up and tune the edge blending in this section to do **Geometry** and **Gamma** correction and eventually to get projectors to form a uniform display image wall.

### 4.2.1 Parameter Settings (edge blending Step 1)

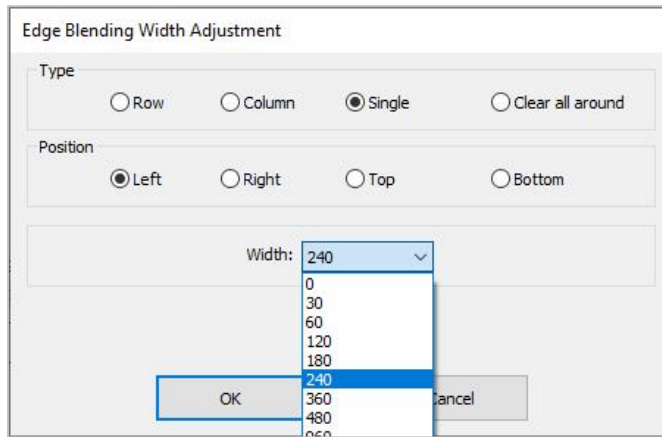
Users set up the layout and parameters of edge blending zone,



1) set up how many outputs and also the layout of the projectors. e.g. 1 x 2 users can set up the layouts, rotation, and edge blending overlap width here.



2) To adjust the edge blending overlap width if needed, the default is 240 pixels,



a. Rules of thumb, the physical projectors' projection overlap width on the wall needs to be bigger than edge blending width.

b. if smaller edge blending zone is needed, double clicking the projector box (see image above) to open the Edge Blending Width Adjustment dialog box

c. Users can always come back to change the width of edge blending overlap width

3) Choose how many channels here for the edge blending and then press 'Next' to go to 'Geometry Correction' Step

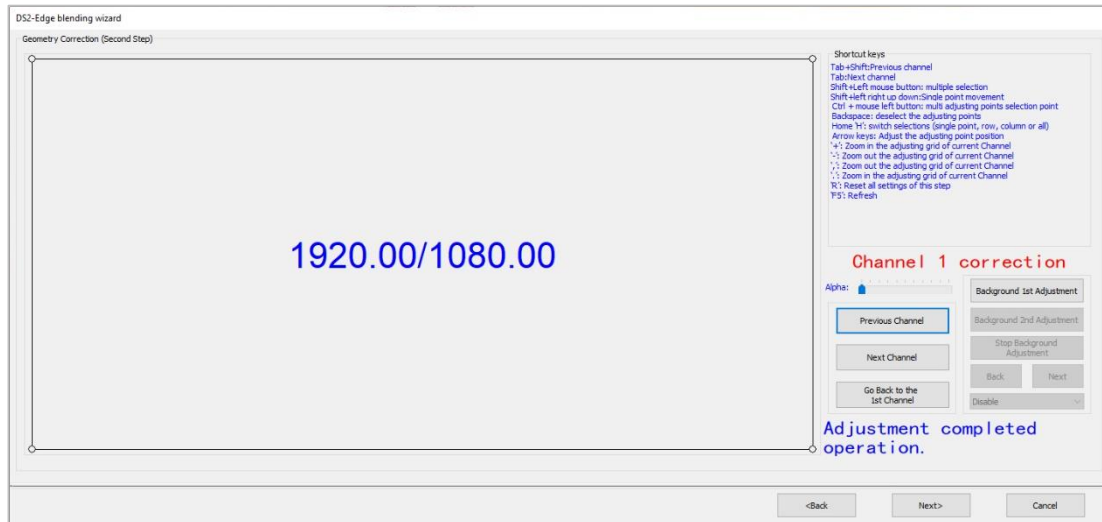
a. Users are able to define the colour of background and grid here

b. 'Go to Gamma Correction' here is the option for users to jump to the gamma correction directly without doing geometry correction.



## 4.2.2 Geometry Correction (edge blending Step 2)

First, the software shows the first output channel with grid of 1920x1080 (default, users can change at chapter '4.1 Output Resolution Setting') and it will be displayed onto the wall as well. Users can use mouse scroll wheel or hotkeys of '+' and '-' to change the size of the grids of current channel.



The 2<sup>nd</sup> output will be shown in different colour grid. users can use comma ',' or '.' on control PC keyboard to zoom in/out the grids.

Use hotkeys below to help the adjustment.

### Hotkeys:

Ctrl + mouse left click: multi adjusting points selection point by point

Ctrl + allow keys: multi adjusting points selection point by point

Shift + mouse left drag: multi adjusting points selection in group

Shift + allow keys: to switch to next adjusting point

'-': Zoom out the adjusting grid of current Channel

'+' : Zoom in the adjusting grid of current Channel

'.': Zoom out the adjusting grid of adjacent Channel

';': Zoom in the adjusting grid of adjacent Channel

Arrow keys: Adjust the adjusting point position

Backspace: deselect the adjusting points

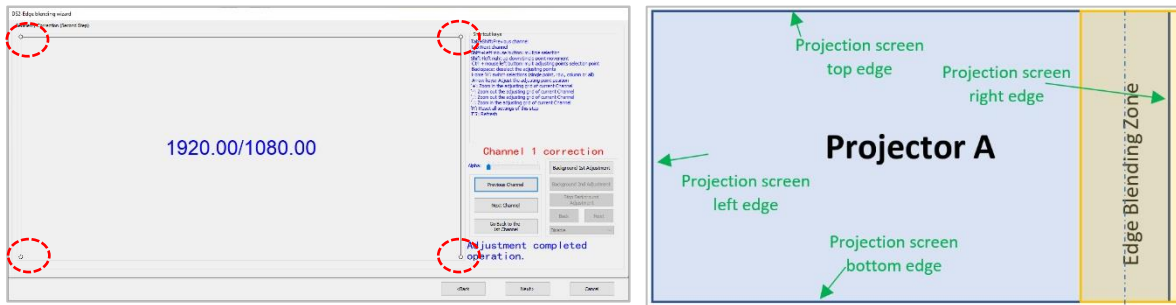
'F5': Refresh

'H': switch selections (single point, row, column or all)

'R': Reset all settings of this step

**Step 1: Adjust 1<sup>st</sup> Channel**

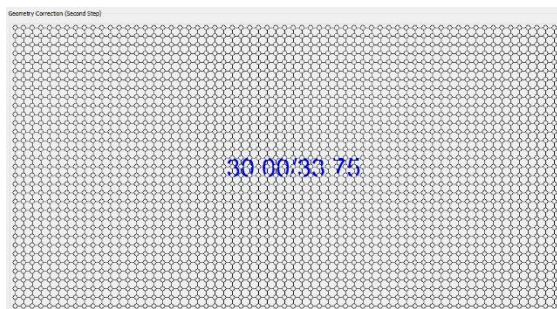
Move the 4 edge lines of first channel (two adjustment points for each line at 1920 x 1080 grid size) to match the 4 edges line of projection screen.



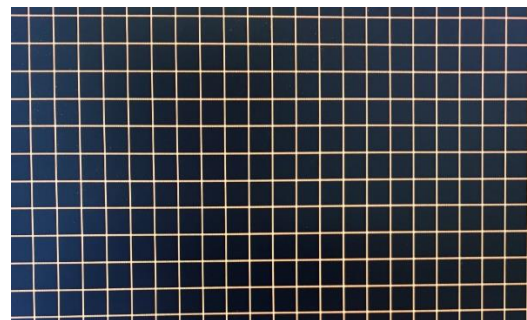
Zoom out the grids to make sure all the lines are straight, otherwise move the lines or adjusting points to ensure the lines are straight and each grid's width/length are at the same size on projection screen.

Users can adjust the 'Alpha' value to show the live video on the projection screen to help the adjustment.

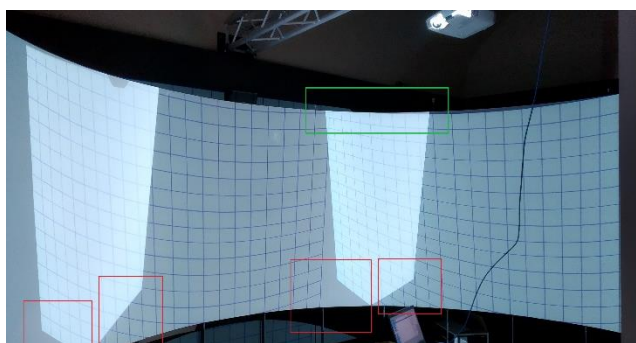
**Grids on software**



**Corresponding grids on projection screen**



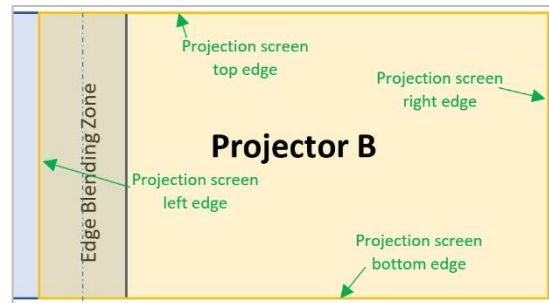
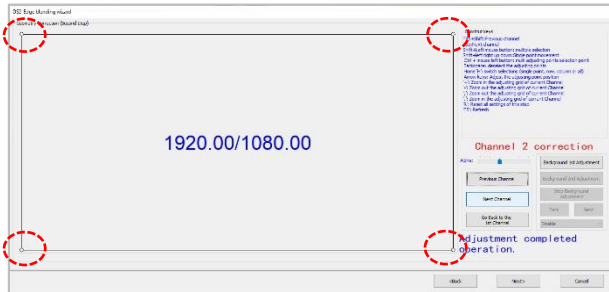
If the projection screen is flat, all the lines and grids should not need large adjustment. If the surface is curved and uneven, users need to adjust each line to make sure the lines are straight, grid sizes are same. See the unadjusted projection on the curved screen below at left and adjusted projection on right.



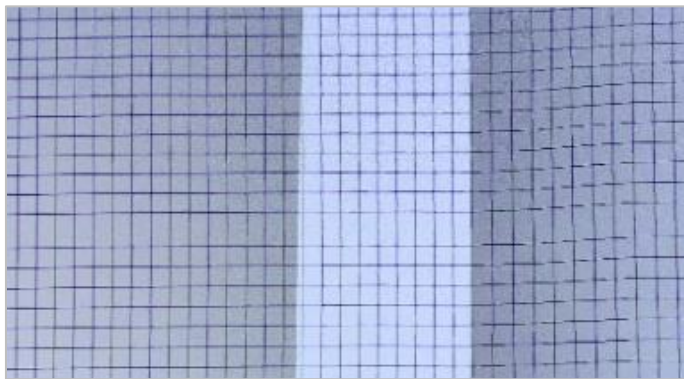
Once it is done, press 'Next Channel' to be ready for adjustment of next channel.

### Step 2: Adjust 2<sup>nd</sup> channel

in adjustment of Channel 2. Do the same procedures as done for the 1<sup>st</sup> channel: Move the 4 edge lines of first channel (two adjustment points for each line at 1920 x 1080 grid size) to match the 4 edges line of projection. Now the edge blending overlap zone has been setup



### Step 3: Geometry correction in edge blending zone



Then to zoom out the current channel's (channel 2) and previous channel's (channel1) grid at the same time step by step from 1920 x 1080 to 30 x 33.75 pixel.

- mouse scroll wheel or hotkeys of '+' and '-' for current channel (channel 2)

- ',' and '.' Hotkeys for previous channel (channel 1)

Each step, both channels are at the same resolution, users need to move the points, lines of the 2<sup>nd</sup> channels in edge blending zone onto top of the channel 1's points and lines to precisely match each other. If needed, the rest of points and lines need to be adjusted as well to ensure the straight lines and same size of grids.

### Step 4: Background Adjustment

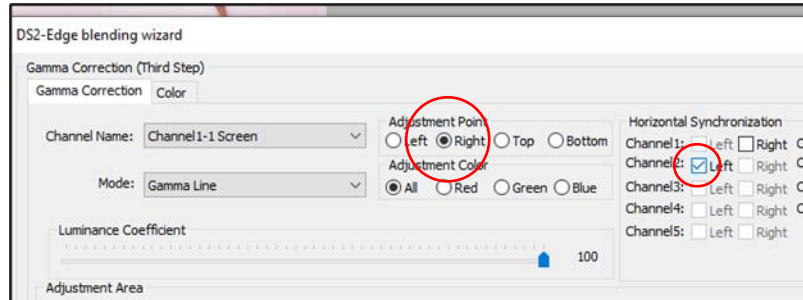


This feature is for users to crop certain part of the projection onto the screen. e.g. if the projection screen has a window or door on it, users can use this feature to crop them out. If there is no area needed to be cropped, this step can be skipped and press 'Next' button directly to go to Gamma Correction.

### 4.2.3 Gamma Correction (edge blending Step 3)

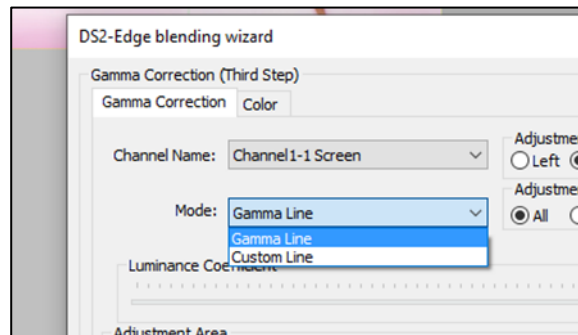
User can adjust brightness for the Edge Blending area to match the rest of the projection. e.g. for a two-projection edge blending, users need to adjust the brightness of 'right of Channel1' and 'left side of Channel 2').

Users can set up the sync of both channels, so when channel 1-right is adjusted, channel2-left will be adjusted automatically see image below



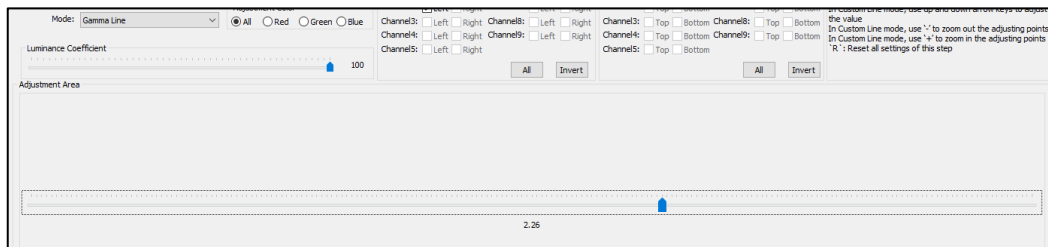
#### 1. Adjustment Modes

DS2 has two adjustment modes: Gamma Line and Custom Line



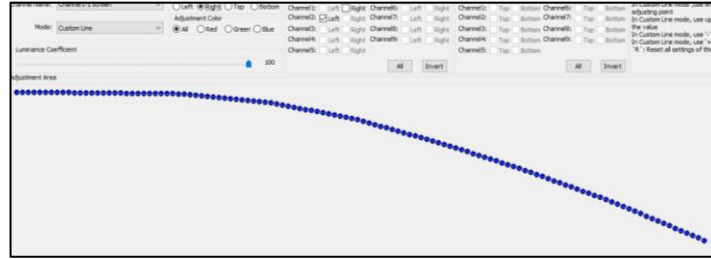
##### a. Gamma Line

Gamma line is the optimized linear adjustment method from SEADA. Users can easily do the gamma correction by adjust the value of linear gamma line.



##### b. Custom Line

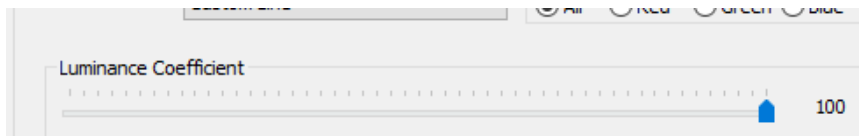
Custom line enables users to adjust the gamma correction stripe by stripe in pixels



The brightness always starts from '256' and finishes at '0'. Users can use mouse scroll wheel or hotkeys to change the amount of adjustment points.

**Tip:** Only the 'right' of channel1 and 'left' of channel 2 need the gamma correction with this curve adjustment. The adjustment points for top, bottom and the other lines all need to be set up at 256 otherwise users will see the black stripe on display wall.

## 2. Luminance Coefficient



If the two projectors have brightness difference, DS2 can change the whole projector output brightness by using different Luminance Coefficient.

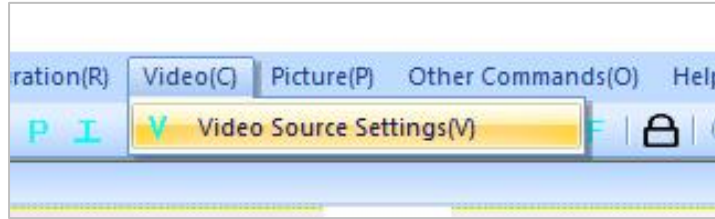
Once the gamma correction is done, press the 'cancel' to save and exist the edge blending set up. Now the edge blending processing is done (see below the projection screen of 1x2 edge blending with two projectors)





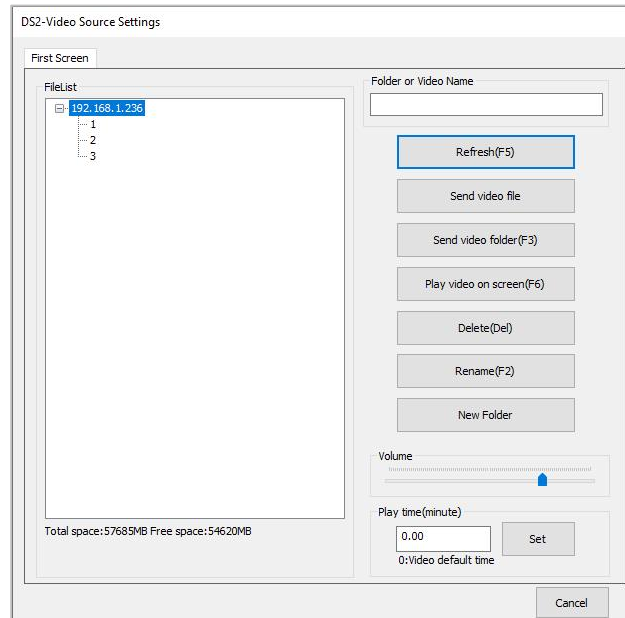
## 5、 Video

Users can manage the video source played on built-in media player here.



### 5.1 Video Source Setting

Users can manage the video folder and files on the built-in media player in this section.



#### 1) Refresh

To reload the video folders and files from DS2 onboard storage

#### 2) Send Video File

Users can upload the video files onto existing folders on GM9

#### 3) Send Video Folder

Users can upload the whole folder of video sources onto GM9

#### 4) Play Video on Screen

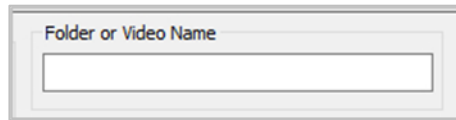
Highlight the video file or folder in the File List and press this button to play the very video or videos in the folder on edge blending wall

#### 5) Delete

Highlight the video file or folder in the File List and press this button to delete this file or folder

## 6) Rename

Highlight the file or folder in the File List and press this button to rename the video or folder name in the list to the new name users entered in 'Folder or Video Name'



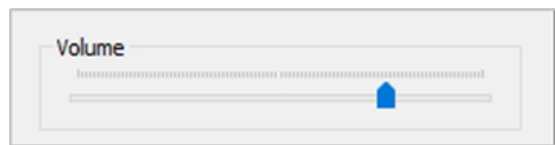
A dialog box with a title bar that says "Folder or Video Name". Below the title bar is a single-line text input field.

## 7) New Folder

Press this button to create a new folder in the list to the new name users entered in 'Folder or Video Name'

## 8) Volume Control

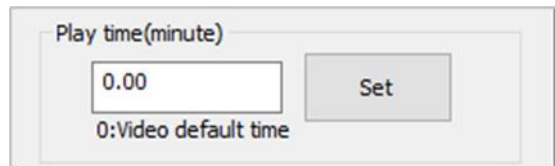
Users can control the volume of the DS2 output audio here.



A volume control slider. The word "Volume" is at the top left. Below it is a horizontal line representing the volume range, with a blue triangular slider knob positioned in the middle.

## 9) Play Time Control

Users can set up the loop interval time between each video here. DS2 will loop all the videos in the current folder at the interval set up by users.



A dialog box titled "Play time(minute)". It contains a text input field with "0.00" inside, a "Set" button to its right, and the text "0:Video default time" below the input field.

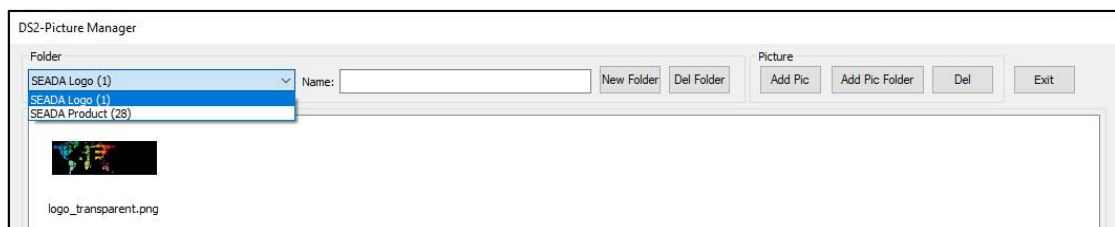
## 6、 Picture

Users can manage the images on DS2 onboard storage, USB and Cloud and set up the display of these images on the projection screen in this section.



### 6.1 Picture Manager

Users can upload the pictures from the PC to DS2 and manage them in this section.



#### 1) Folder

It shows the current picture folders on the onboard storage and how many pictures in each folder. All the pictures will be viewed in icon mode in display area.

#### 2) New Folder

Type in the name and press this button to create a new empty folder

#### 3) Del Folder

Highlight an existing folder and press this button to delete this folder and all the pictures in the folder

#### 4) Add Pic

Add new pictures into the highlighted folder

#### 5) Add Pic Folder

Add the folder with the pictures from the PC to DS2

#### 6) Del

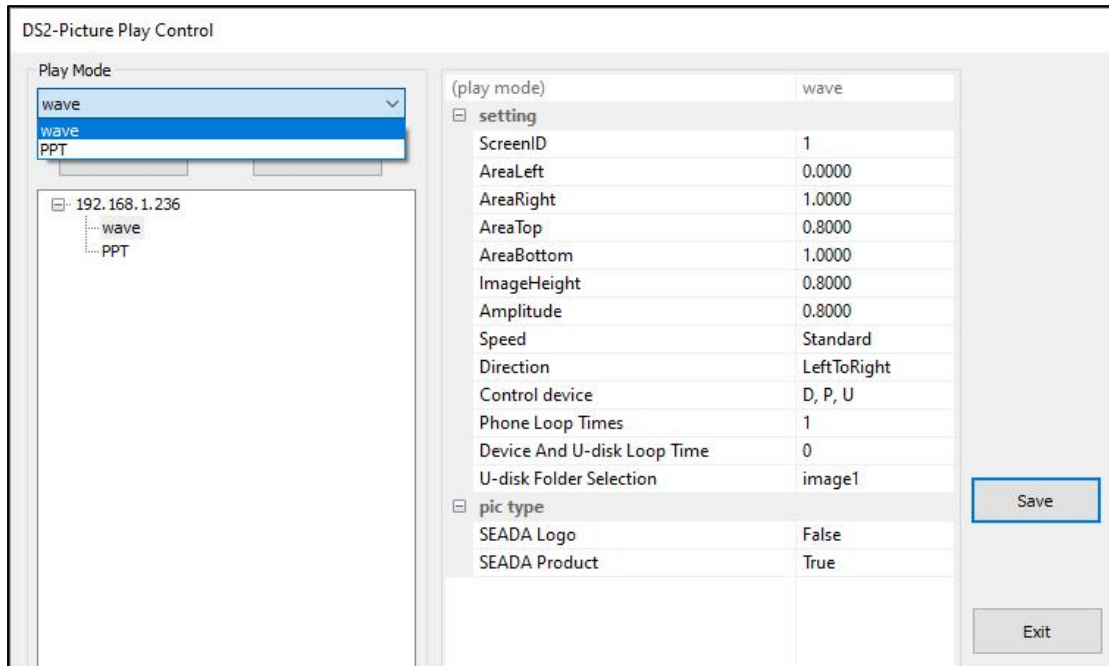
Delete the highlighted pictures in the folder

#### 7) Exit

Close this window

## 6.2 Picture Play Control

Users set up the play mode and locations on projection screen for the pictures in this section



### 1) Play Mode

DS2 have wave and PPT two modes. Users can add as many modes as they want to the play list.

### 2) Setting

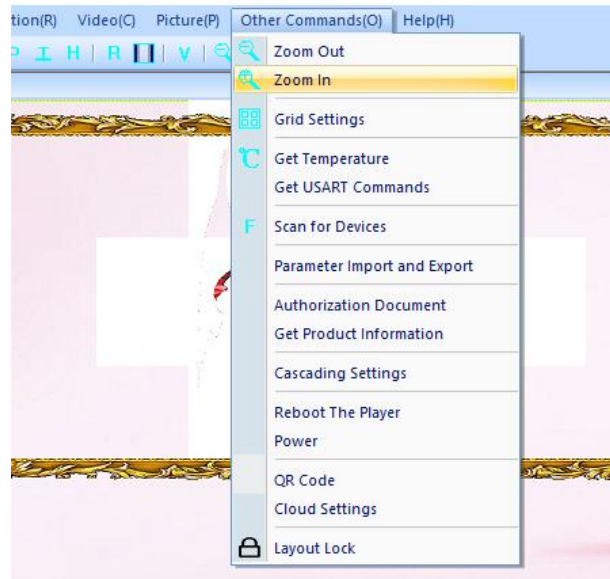
Settings for Wave Mode			
AreaLeft:	Position of left-side of display area	Speed:	Picture moving speed
AreaRight:	Position of right-side of display area	Direction:	Picture moving direction in display area
AreaTop:	Top position of the picture display area	Control Device:	pictures source (Local Disk, Phone or USB stick)
AreaBottom:	Bottom position of the display area	Phone Loop Times:	Picture from smart phone loop times
ImageHeight:	Picture height in picture display area	Device and U-disk Loop Time:	Picture from local disk and USB stick loop times
Amplitude:	Picture wave amplitude	U-disk Folder Selection:	Choose which folder to play from USB stick. Folder name on USB must be named as image1 to image10

Settings for PPT Mode			
AreaLeft:	Position of left-side of display area	HideTime	Picture PPT off Interval
AreaRight:	Position of right-side of display area	Control Device:	Pictures source (Local Disk, Phone or USB stick)
AreaTop:	Top position of the picture display area	Phone Loop Times:	Picture from smart phone loop times
AreaBottom:	Bottom position of the picture display area	Device and U-disk Loop Time:	Picture from local disk and USB stick loop times
ShowTime:	Picture PPT on interval	U-disk Folder Selection:	Choose which folder to play from USB stick. Folder name on USB must be named as image1 to image10

### 3) Picture Type

To choose the pictures of which folder will be played in this mode. 'True' means the pictures in this folder will be played. 'False' means they will not.

## 7、 Other Commands



### 7.1 Zoom Out

Zoom out the projection display area in software.

### 7.2 Zoom In

Zoom in the projection display area in software.

### 7.3 Grid Settings

Set up the number of grids in Projection Display Area in software UI

### 7.4 Get Temperature

Check CPU temperature.

### 7.5 Get USART Commands

Display the RS232 commands sent by 3<sup>rd</sup> controller to DS2 via serial port live.

### 7.6 Scan for Devices

Scan and find all the DS2 devices on the same network

### 7.7 Parameter Import and Export

Import the previous saved parameters to DS2 or export the current DS2 parameters out for future reference

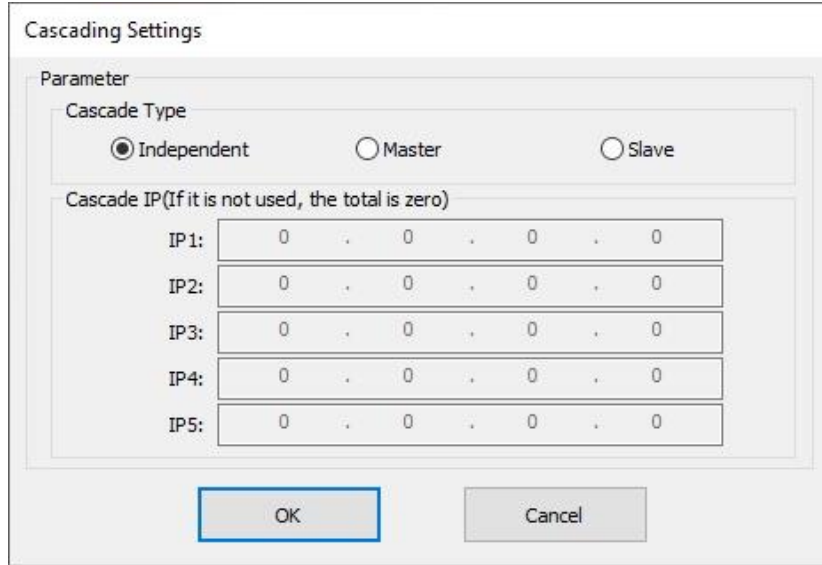
### 7.8 Authorization Document

Load the license for the edge blending channels

### 7.9 Get Product Information

It shows the current Firmware version

### 7.10 Cascading Settings



The screenshot shows a 'Cascading Settings' dialog box. It has a 'Parameter' section with 'Cascade Type' options:  Independent,  Master, and  Slave. Below this is a 'Cascade IP (If it is not used, the total is zero)' section with five rows for IP1 through IP5, each with a text input field containing '0 . 0 . 0 . 0'. At the bottom are 'OK' and 'Cancel' buttons.

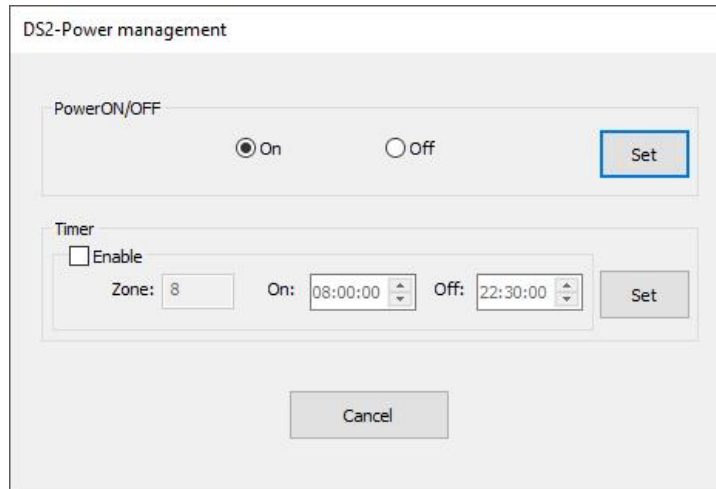
- 1) Independent: unit is used as stand alone
- 2) Master: unit is set up as master unit in the system
- 3) Slave: unit is set up as slave unit in the system to follow master unit

### 7.11 Reboot the Player

User can remotely reboot the DS2 unit in this section.

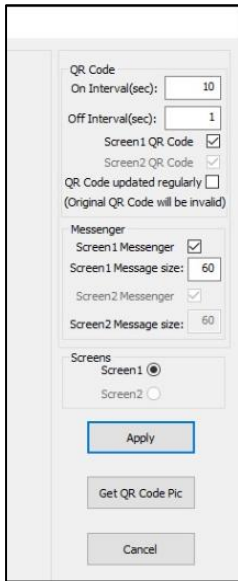
### 7.12 Power

User can remotely power on/off directly or schedule a power on/off.



The screenshot shows a 'DS2-Power management' dialog box. It has a 'PowerON/OFF' section with  On and  Off radio buttons, and a 'Set' button. Below this is a 'Timer' section with an  Enable checkbox, a 'Zone' dropdown set to '8', 'On' and 'Off' time pickers set to '08:00:00' and '22:30:00' respectively, and a 'Set' button. At the bottom is a 'Cancel' button.

### 7.13 QR Code



To set up the QR code which enables the features of sending images, message, greetings, and emoji from smart phone via Cloud and control the DS2 using phone within local network. This feature is option.

Please press **'Apply'** to enable the changes.

1) QR Code

- i. On Interval: QR code display on projection screen period
- ii. Off Interval: QR code off projection screen period
- iii. Screen1 QR Code: Enable the QR code on screen 1
- iv. Screen 2 QR Code: Enable the QR code on screen 2
- v. QR Code Updated Regularly: QR code will change every 24 hours or when unit being power off/on

2) Messenger

It enables/disables the message and greeting ability on Cloud management.

3) Screens

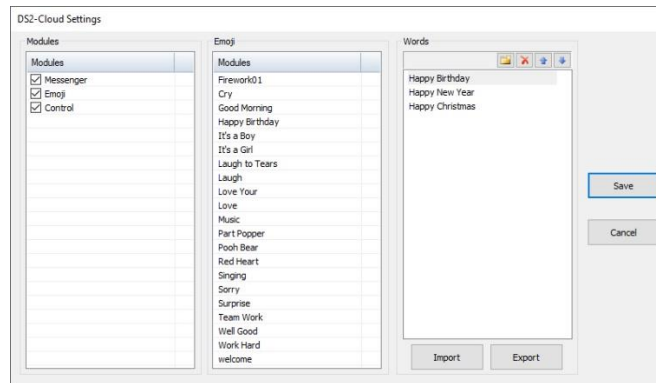
Choose which projection screen the QR is on

4) Get QR Code Pic

To get the QR code picture. If users want to keep the Cloud management feature from the public, they can disable the QR code shown on projection screen and keep the QR code picture by themselves.

### 7.14 Cloud Settings

Users can enable or disable the Messenger, Emoji and Control feature from the Cloud management and manage the greetings on the cloud.



### 7.15 Layout Lock


It will lock the current layout away from any movement.

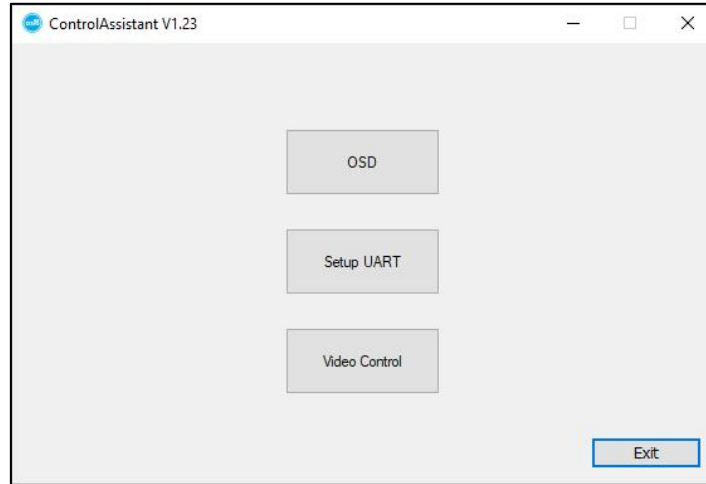
## 8、 Help

Shows the software version detail.



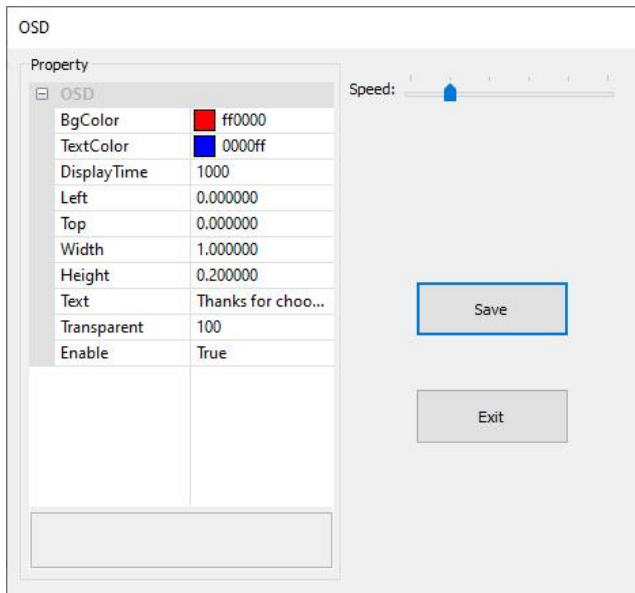
## v. Control Assistant Tools

Run the control assistant software  in the sub folder of tools' in software folder. Users will be able to set up Scrolling Text, Video Play Control and Serial Port Settings.



### 1、 OSD

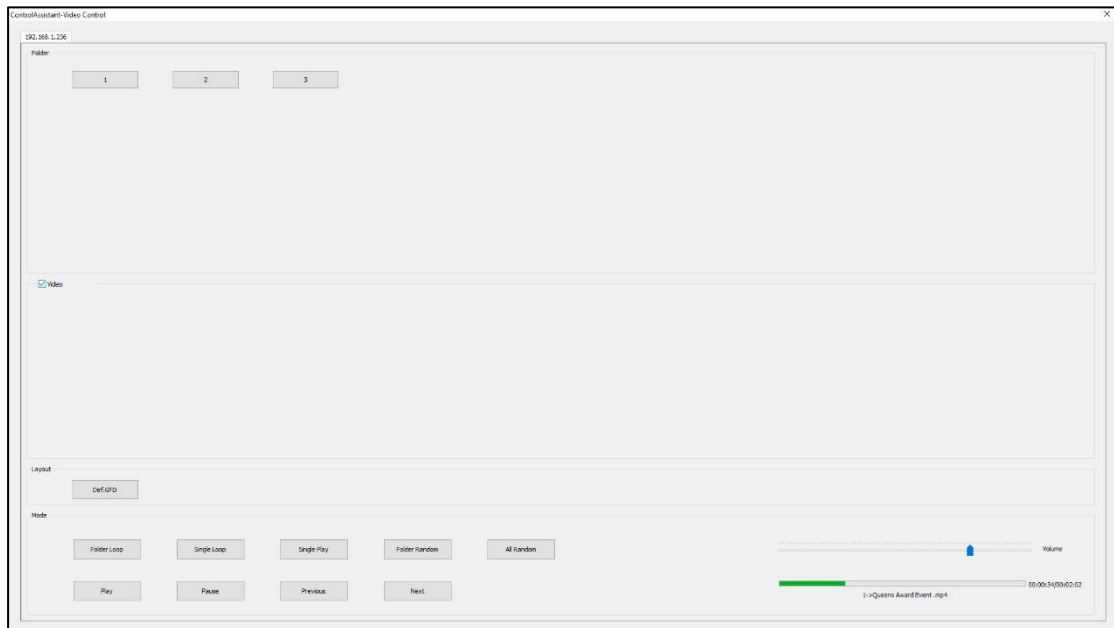
Users can set up the scrolling text in this section.



BgColor:	Background colour
TextColor:	Text font colour
DisplayTime:	Scrolling text display period
Left:	Left position of display area
Top:	Top position of display area
Width:	Display area width
Height	Text height
Text	Text, up to 140 characters
Transparent	Background transparency
Enable	Ture is enabled, False is disabled.

## 2、 Video Control

Users can manage the videos on DS2 in this section.



### 2.1 Folder

Click on folder, system will play videos in that folder

### 2.2 Video

Tick the 'Video' and click on folder, 'video' area will show all the videos in this folder and users can choose which video to play.

### 2.2 Layout

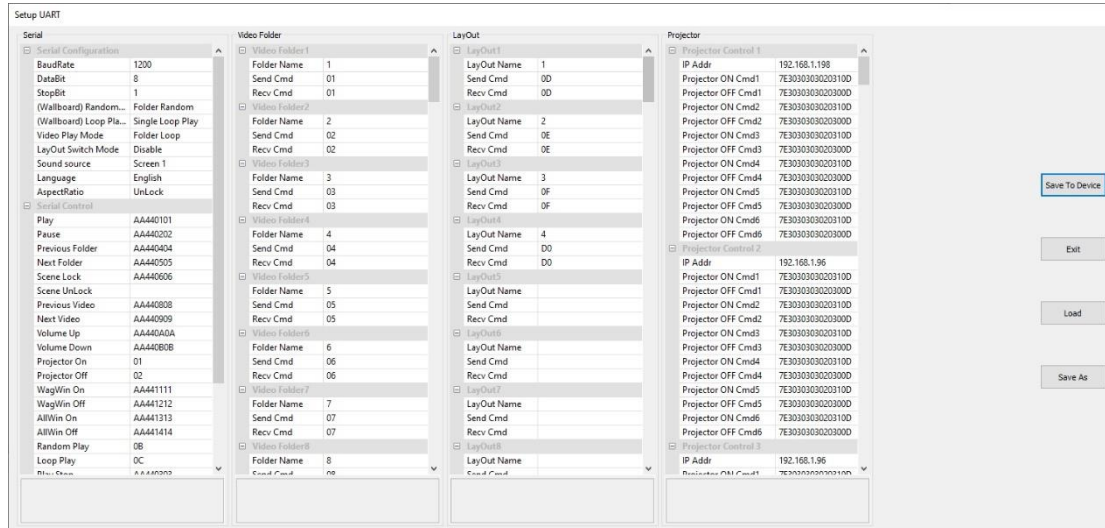
Users can change the preset layouts by clicking the preset layout button

### 2.2 Mode

Users can manage 'Playing the Video' in this section.

### 3、 Set up UART

Users can set up the serial port parameters in this section



#### 3.1 Serial

These are the serial port parameters and command lines for controlling this unit. Customers can customise the settings, but not recommended.

#### 3.2 Video Folder

If users want to use 3<sup>rd</sup> party controller to control videos of which folder to be played, video folder parameter needs to be setup.

- The folders name here needs to be identical to the video folder name in 'Video Source Setting' (see chapter 5.1)

#### 3.3 Layout

If users want to use 3<sup>rd</sup> party controller to change the preset layouts, layout parameter needs to be setup.

- The layout name here needs to be identical to the preset layout name in 'DS2 Onboard Layout List (see chapter 'III UI-No.4)

#### 3.3 Projector

Users can set up command lines here to control projectors, screens and other devices which devices which support remote power on/off via RS232.

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