



## AL680 HD Controller

Aeson LED Display Technologies is proud to introduce our new Alchemy 680 HD Controller which is a significant upgrade from our current 660 Controller. This new controller continues the tradition of Aeson introducing leading edge technological improvements to the LED video display industry such as our 16:9, patent pending, native aspect ratio cabinets.

The following are the key features of our new Alchemy HD680 controller.

- RJ45 LOCKING Neutrik Ethercon connectors which replace the basic RJ45 connectors.
- A more robust locking IEC power connector. The power cable will never be able to be dislodged.
- The controller is 1RU (rack unit) as opposed to 1.5 RU for the 660.



## Statement

Dear New Alchemy 680 HD Owners,

Welcome to the User Manual for the latest innovative product from AESON LED Video Display Technologies (hereinafter referred to as AESON). It is our great pleasure to offer this manual to help you understand and use our latest controller. The contents of this manual are subject to change without notice. If you have any questions please feel free to contact us. We would like to express our sincere thanks to you for purchasing and supporting AESON products.

## Copyright

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## Trademark



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## 1 Safety Instructions

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To avoid potential hazards, it is critical that you use this equipment according to this user manual. In the event of breakdowns, it is not permitted for any reason to disassemble the unit for maintenance. Failure to abide by this policy will invalidate the warranty. Please contact the after-sales department of AESON accordingly for service issues.

### High voltage danger

This product has high voltage. In order to avoid the possibility of a debilitating shock it is not permitted to disassemble the rear cover. Failure to abide by this policy will invalidate the warranty. Please contact the after-sales department of AESON for service issues.

### Warnings

- 1) Water and/or any other liquid is strictly prohibited to come in contact with this equipment. If it is determined that liquid of any kind came in contact with this product the warranty will be considered null and void.
- 2) Keep the product away from fire sources.
- 3) When the product emits an abnormal sound, or you smell smoke, unplug the power cord immediately.

### Precautions

- 1) It is critical that you read the instructions very carefully before operating the equipment and keep it in your possession for future reference.
- 2) If there is thunder and lightning in the vicinity of the product or the equipment will not be used for an extended period of time, please unplug the power cord.
- 3) This equipment is not allowed to be operated by non-professionals. Users must receive instruction from professionals.
- 4) In order to avoid damage to the equipment or an electric shock do not insert any object into the vent hole of this equipment.
- 5) This equipment shall not be operated at a site near water or other very humid locations.
- 6) This equipment shall not be operated at a location close to cooling fans.

- 7) This equipment shall not be operated at a site where the temperature is in excess of 30 degrees Celsius (86 degrees Fahrenheit).
- 8) Handle the power cord with care so as to avoid damaging it.
- 9) In the event of following situations, unplug the power cord contact the after-sales department of AESON for service.
  - a) Liquids penetrate into the equipment;
  - b) The equipment is dropped and hits the ground\_or the enclosure is damaged in any manner whatsoever;
  - c) If the equipment acts abnormally or its performance is different from the manner in which it previously worked.

Please read above instructions thoroughly. Aeson will assume no responsibility or liability of any nature whatsoever for the personal safety of individuals or for product damage caused by not following these instructions exactly as detailed above.

## 2 Overview

The AL680 HD controller has an innovative design. The configuration of an LED screen can be done at any time without requiring a computer. Manual adjustment of screen brightness is easy and convenient.

Features:

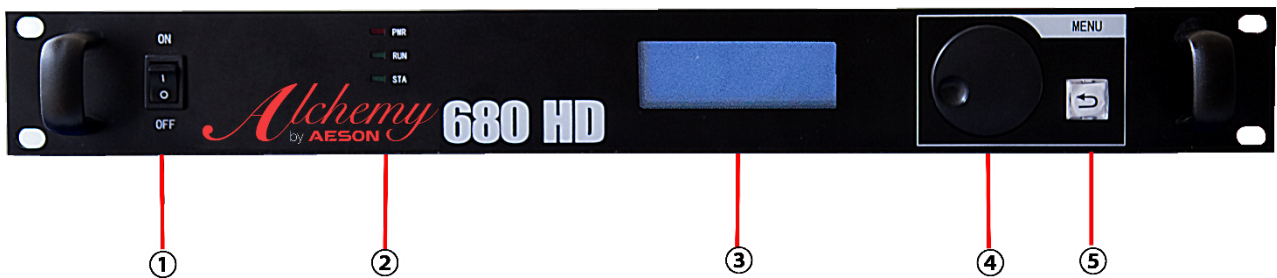
- 1) Supports screen configuration without the need for a computer.
- 2) Easy and convenient manual adjustment of screen brightness.
- 3) HDMI/DVI video input/output.
- 4) HDMI audio input/external audio input.
- 5) Supports high-bit level video input (12bit/10bit/8bit).
- 6) Supports the control system with 12bitHDMI &HDCP input.
- 7) Loading capacity of common video sources:  $1920 \times 1200$ ,  $2048 \times 1152$ ,  $2560 \times 960$ .
- 8) Supports 18bit gray scale processing and display.
- 9) Supported video formats: RGB, YCrCb4:2:2, YCrCb4:4:4.
- 10) Loading capacity of high-bit level video sources:  $1440 \times 900$ .
- 11) Able to cascade multiple units for uniform control.
- 12) Innovative design enables smart configuration, and screen settings can be done

within 30 seconds!

- 13) Supports white balance calibration and color gamut mapping based on different features of the LEDs to ensure colors are faithfully reproduced.
- 14) Designed with a lockable power connector making it more stable and reliable.

### 3 Hardware Connection

#### 3.1 Front Panel



① Power indicator

② Indicator lights

**PWR:** Power indicator

**RUN:** Operation indicator 1

It blinks slowly when no video source is available. (The light stays on for 2 seconds and then off for 2 seconds.)

It blinks normally when video source is available. (It blinks about twice per second.).

It blinks quickly when start-up screen is displayed.

When the redundancy works, the indicator blinks at a frequency of breathing.

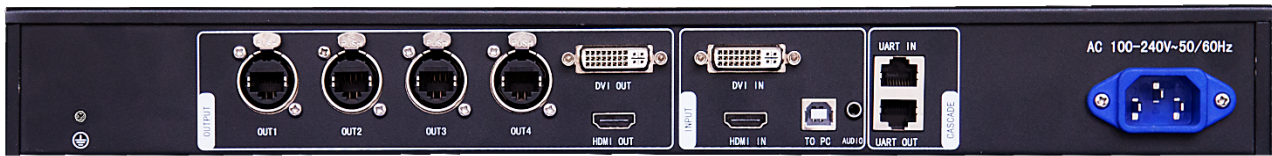
**STA:** Operation indicator 2. It is always on when the device runs normally.

③ Operation screen

④ **Knob:** Press the knob to enter the option and rotate the knob for selection or adjustment.

④ **ESC:** Exit from the current operation or option.

### 3.2 Rear Panel



#### INPUTS

AUDIO	Audio input
HDMI IN	HDMI input
DVI IN	DVI input

#### OUTPUTS

DVI OUT	DVI loop out
HDMI OUT	HDMI loop out
OUT1~4	4-channel Neutrik Ethernet outputs

#### CONTROL

TO PC	Connected to PC, USB control interface
UART IN、OUT	Cascade input, output

#### POWER

AC-100-240V-50/60HZ	AC Power interface
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## 4 Signal Connection

Please refer to the interface description in Chapter 3 for hardware connection.

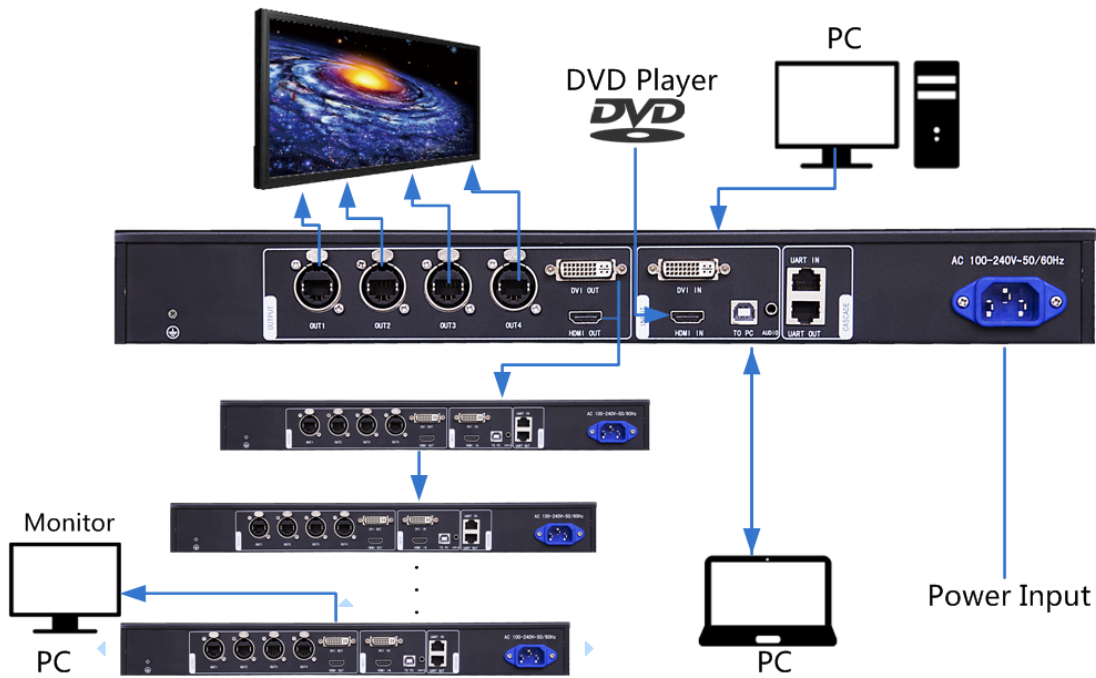


Fig. 4-1 AL680 HD signal connection

Connect as follows if it is necessary to control multiple AL680 HD units simultaneously.

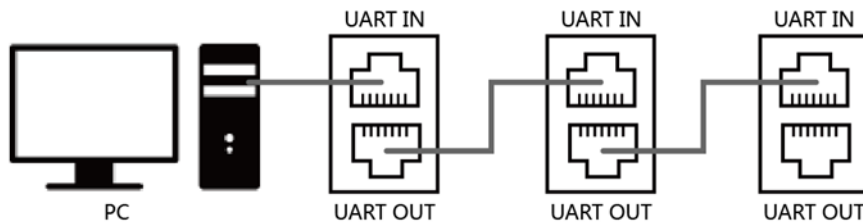


Fig. 4-2 Multiple units cascading



## 5 Operation Instructions

All the operations of the AL680 HD can be achieved by one knob and one return key.

**Knob:**

- ✧ Press the knob in the main interface to enter the menu operation interface.
- ✧ Rotate the knob to select menus in the menu operation interface. Press the knob to select current menu or enter a submenu.
- ✧ Rotate the knob to adjust the parameters of the selected menu with a parameter. **Please remember to press the knob again for confirmation after adjustment.**

**ESC:** Return key to exit from current menu or operation.

## 6 Main Interface

After starting the controller, the main interface of the LCD screen is shown below:



	It denotes that HDMI interface has video input. It blinks when video source has no signal.
	It denotes that this unit is in Master mode
	Ethernet output (It is Port 2 output at present.)
	Current brightness is 50%
	Key lock icon. When this icon appears at the main interface, it denotes that functions of the keys and knob are locked.
	It denotes that the input resolution is 1920 x 1080 pixels with a frame rate of 60 Hz.

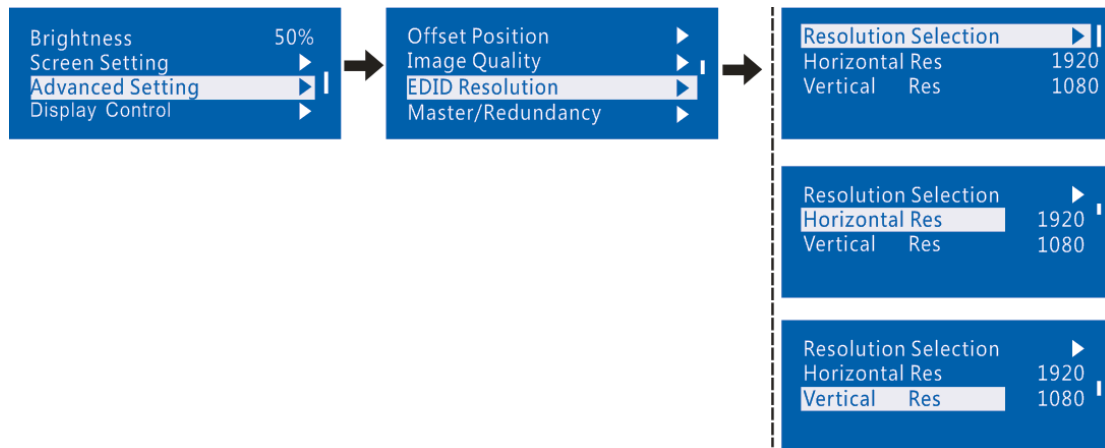
## 7 Operating Instructions

AL680 HD has powerful functions and is easy to operate. Generally, the LED display can be started and used normally through the first three steps. Other options can be set selectively in advanced settings so as to further customize your LED experience. Please refer to [7.4 Advanced Setting](#).

## 7.1 Setp1 EDID Resolution Setting

This function can be used to set the output resolution of the video card. In general, the content shown on the screen cannot exceed the output resolution of video card.

Enter the menu “**Advanced Setting**” to set the resolution of the video source. It can be achieved in two modes: preset resolution and customize resolution.



### Mode I: Preset resolution

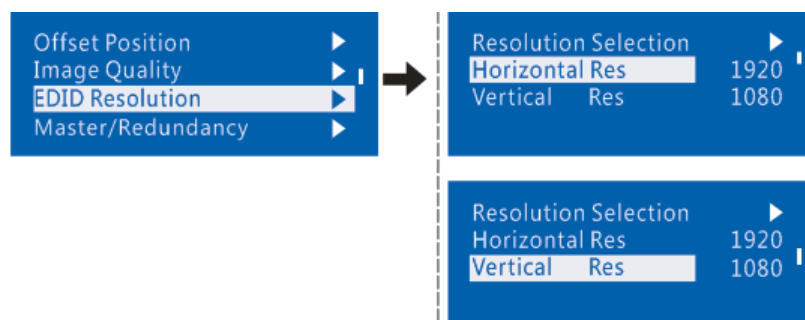
Choose an appropriate resolution and refresh rate from the standard preset resolutions.

If there is no proper preset value, please move on to **Mode II: Customize resolution**.



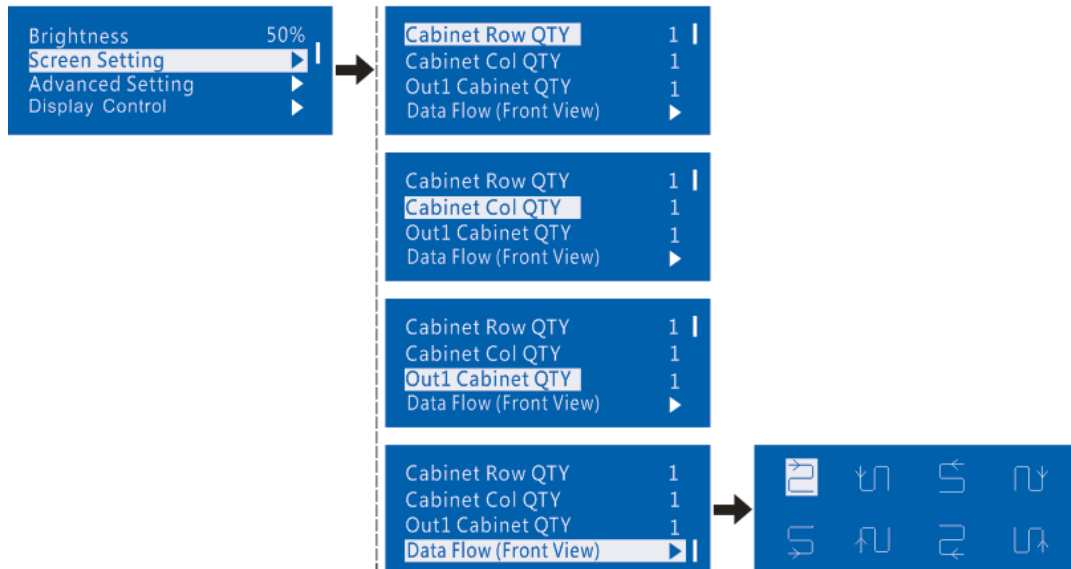
### Mode II: Customize resolution

Rotate the knob to customize width (increasing by even numbers), height and refresh rate, then select “Apply” and press the knob for confirmation. The customized resolution won't take effect if not applied.



## 7.2 Step 2 Screen Setting

- 1) Power on the LED display. If the cabinet displays normally, move on to step 2). If the cabinet displays abnormally, load cabinet files first and save them to receiving cards. See detailed operation in [7.4 Advanced Setting](#).
- 2) Enter **"Screen Setting"** submenu. Rotate the knob to access other options respectively for settings, as shown in the figures below:



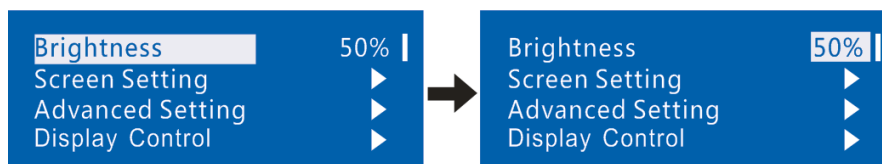
- a) Set **Cabinet Row QTY** and **Cabinet Col QTY** based on the number of cabinet rows and columns present.
- b) Set the quantity of cabinets loaded by Ethernet port 1 (**Out1 Cabinet QTY**). The unit has some limitations on the cabinet quantity loaded by Ethernet ports. See details in Notes i).
- c) Set data flow of the screen and pay attention to Notes iii), iv) and v).

Notes:

<p>i. If the number of ports with loads is <math>n</math> (<math>n \leq 4</math>), the quantities of cabinets loaded by each of the first <math>n-1</math> ports must be equal and also be an integral multiple of the quantities of cabinet rows or columns and, meanwhile, be greater than or equal to the quantities of cabinets loaded by the <math>n</math>th port.</p>	<p>Example: e.g.: if Port 1, Port 2, Port 3 have loads, cabinet quantity of Port 1 and Port 2 must be equal and also be an integral multiple of the quantity of cabinet row or column. As a result, set Port 1 Cabinet quantity only according to actual situation during screen settings. The quantity of receiving card loaded by Port 3 <math>\leq</math> the quantity of cabinet loaded by Port 1.</p>
<p>ii. In a case of uniquely-shaped cabinets, cabinets with different sizes and uniquely-shaped screen, the software NovaLCT-Mars is required to be connected to configure the screen.</p>	
<p>iii. During Data Flow setting, rotate the knob to see the results of different types of data flow on the screen in real time. If satisfied with the current data flow, you must press the knob to save the setting. Press MENU to exit from the current operation.</p>	
<p>iv. During Data Flow setting, make sure that the data flow of each port is connected along the same direction.</p>	
<p>v. During Data Flow setting, make sure that the start position of Port 1 is the start position of the whole data flow connection.</p>	

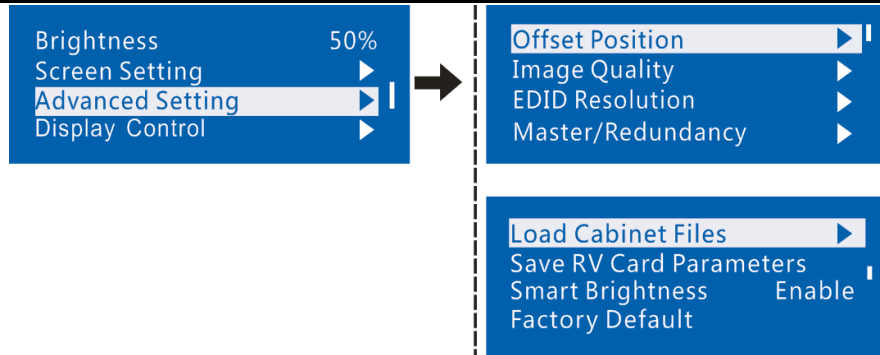
### 7.3 Step 3 Screen Brightness Adjustment

Return to main menu interface. Press the knob to select the corresponding value. Now you can rotate the knob to adjust the brightness value.



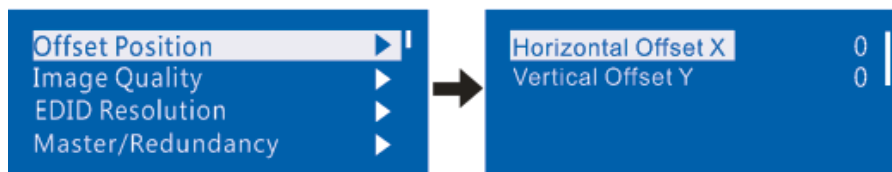
### 7.4 Advanced Setting

Enter the submenu of Advanced Setting, rotate the knob, and then users can see following eight setting options included in Advanced Setting: Offset Position, Image Quality, EDID Resolution, Master/Redundancy, Load Cabinet Files, Save RV Card Parameters, Smart Brightness, and Factory Default.



#### 7.4.1 Offset Position

Adjust the starting point coordinates. Here the upper limit of offset is regulated meaning that the total of the offset and screen size cannot exceed the output resolution of video card.



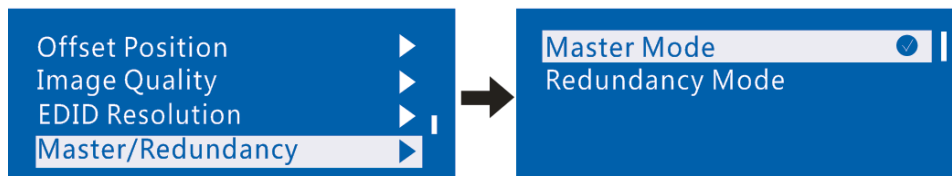
#### 7.4.2 Image Quality

Set gamma, contrast, saturation, and hue of image as required. Save these parameters to the receiving card by applying "Save RV Card Parameters" after proper adjustment.



#### 7.4.3 Master/Redundancy

Set this unit as Master Mode or Redundancy mode when the system has multiple units.



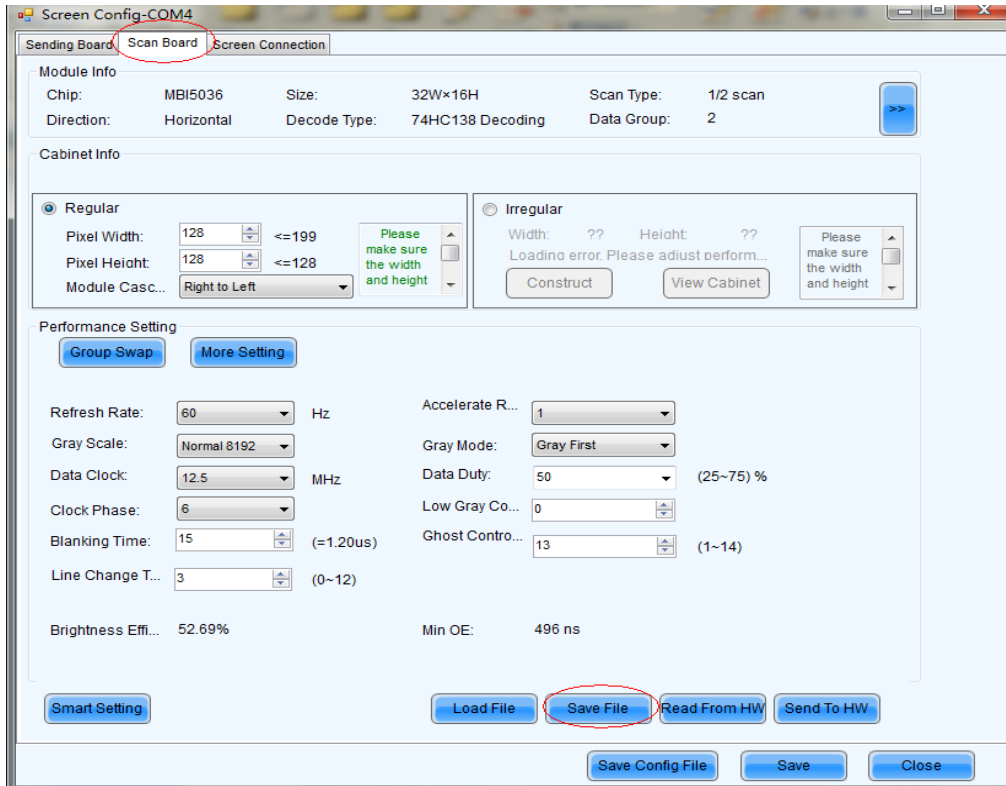
#### 7.4.4 Loading Cabinet Files

After LED display is powered on, you must load cabinet files first if the cabinet fails to display normally. The cabinet files must be sent to the AL680 HD through NovaLCT-Mars

beforehand. The following figures show the procedures:

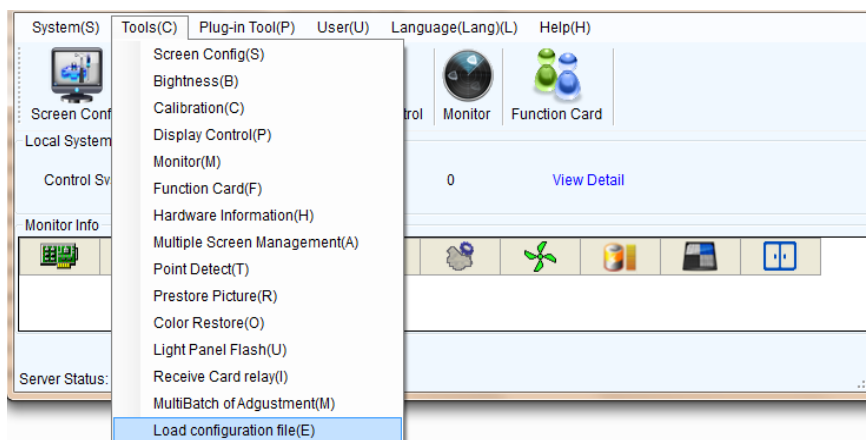
1) Save cabinet configuration files

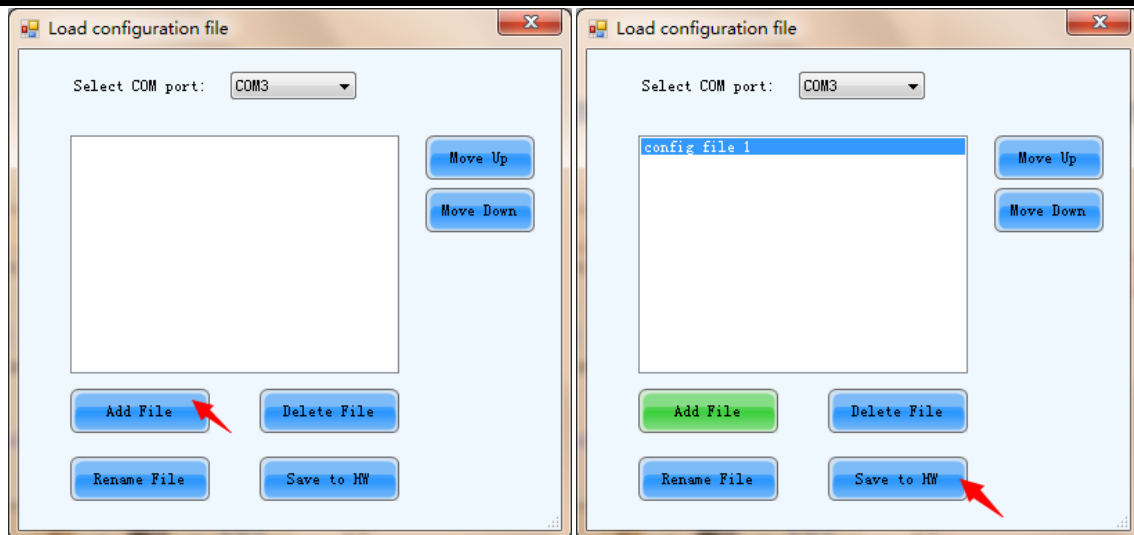
Click **Save File** to save cabinet configuration files (.rcfg) to the local file of the PC after the configuration of the receiving card is completed.



2) Import cabinet configuration files into AL680 HD.

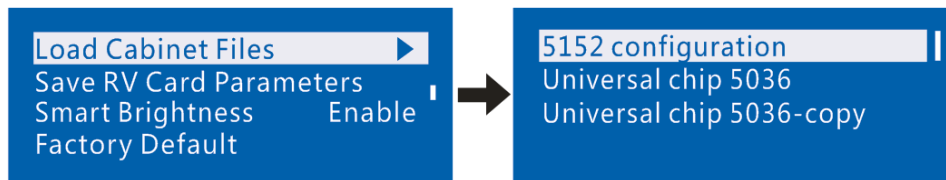
The operating steps are as follows:





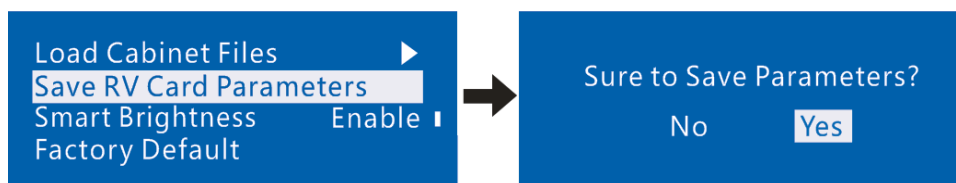
**Tip:** NovaLCT-Mars will automatically read the existing configuration files in AL680 HD after entering the AL680 HD setting interface. You can modify the file name, adjust file order, or delete the file, etc. on NovaLCT-Mars.

- 3) Load cabinet configuration files and files are sent to all the cabinets loaded by current AL680 HD unit.



- 4) Save cabinet configuration files to receiving card. See detailed operation in [7.4.5 Save RV Card Parameters](#).

#### 7.4.5 Save RV Card Parameters



#### 7.4.6 Smart Brightness

This function is disabled by default. This function can only be enabled successfully if the configuration files are loaded in advance. Only non-pulse-width modulation (PWM) chips are supported for the moment.



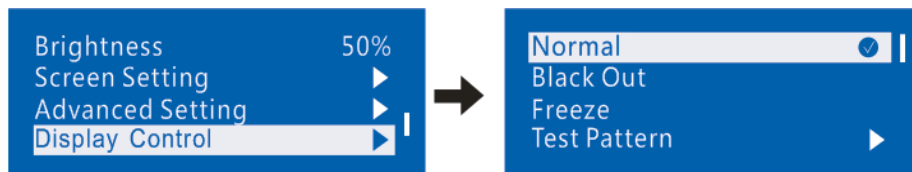
Load Cabinet Files ▶  
Save RV Card Parameters  
**Smart Brightness** Enable  
Factory Default

#### 7.4.7 Reset AL680 HD to Factory Default Settings

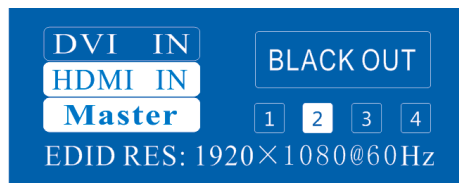


Load Cabinet Files ▶  
Save RV Card Parameters  
Smart Brightness Enable  
**Factory Default**

#### 7.4.8 Display Control



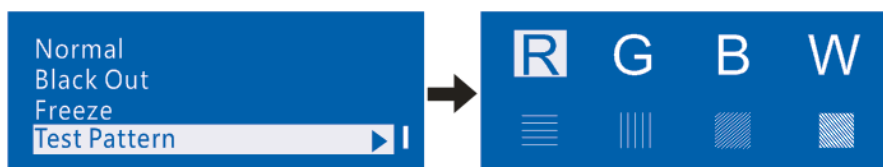
- 1) **Normal**: The screen is restored to a normal display.
- 2) **Black Out**: The screen is blacked out and then the home page of AL680 HD operation screen is shown as the figure below:



- 3) **Freeze**: Screen is frozen and then the home page of AL680 HD operation screen is shown as the figure below:

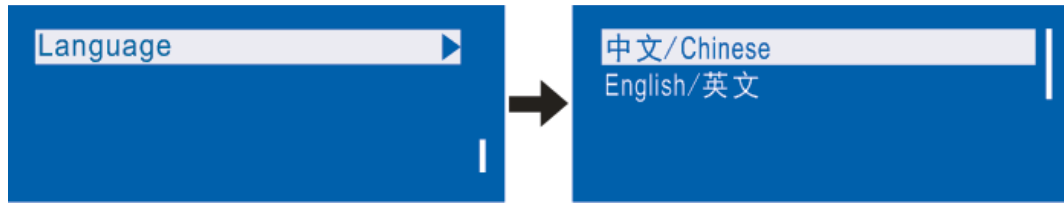


- 4) **Test Pattern**: The screen can be tested through four colors (red, green, blue and white) and four patterns.





## 7.5 Language Setting



## 8 FAQ and Precautions

Problem	Solutions
LED display is dark.	<p>Inspect whether the power connection is correct and the switch has been turned on;</p> <p>Use test patterns to confirm whether the connection of LED is correct and works normally;</p> <p>Inspect whether AL680 HD output has signal and the output is not set to Black Out;</p> <p>Inspect whether the mode and parameters of screen configuration are correct.</p>
Restrictions	<p>1) The product can only support configuration without requiring a computer for a rectangular screen composed of cabinets with same size and specifications; special-shaped cabinets and screens need online configuration.</p> <p>2) Offline and online configuration cannot be performed on the same screen at the same time.</p>

## 9 Specifications

### Input Index

Port	Qty	Resolution specification
DVI	1	VESA standard
HDMI	1	EIA/CEA-861 standard; compliance with HDMI-1.3 standard; supports HDCP

### Output Index

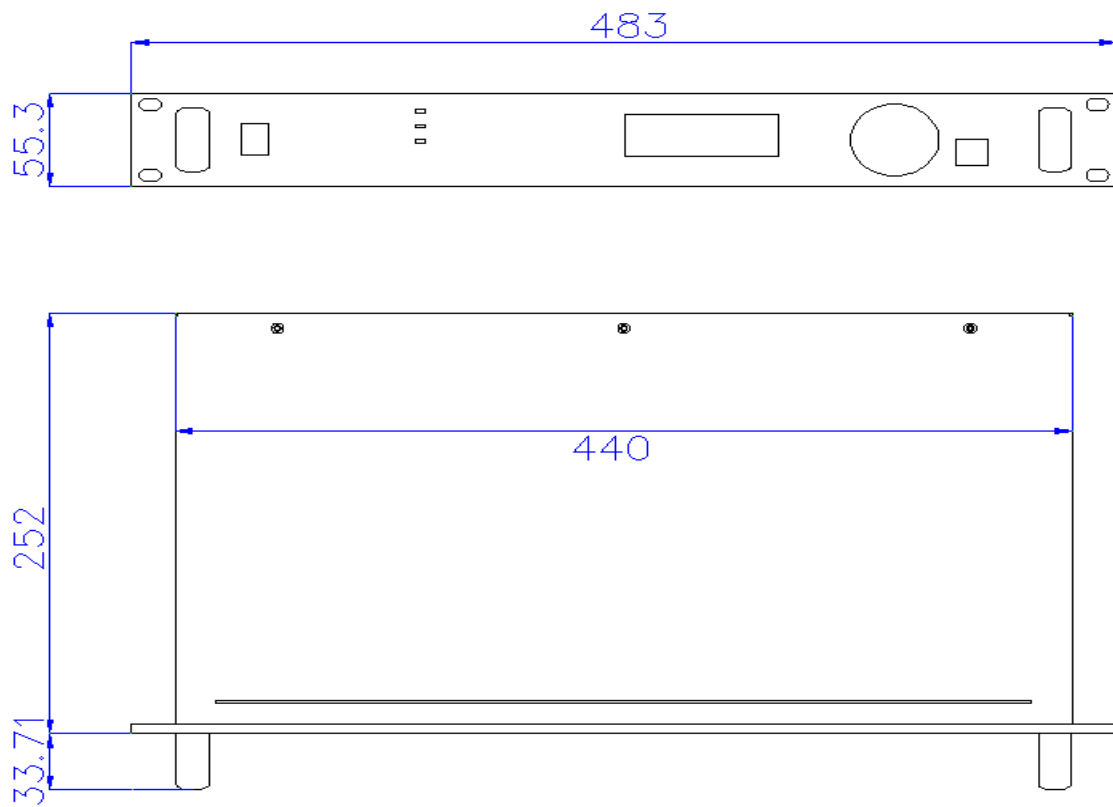
port	Qty	Resolution specification
DVI OUT	1	In accordance with DVI input
HDMI OUT	1	In accordance with HDMI input

### Overall Specifications

Input power	AC 100–240V, 50/60Hz
Overall power consumption	16W
Ambient temperature	–4 ~140 F
Ambient humidity	0%~95%
Net weight	7.91bs
USB Cable	4.92'
DVI Cable	4.92'

## 10 Installation Dimensions

1U 19" standard rack mount chassis (mm)



**Alchemy**  
by **AESON**