



# User's Manual

Controller MCTRL660

Rev1.3.1 NS110100125

## Statement

Dear users,

Welcome to use the product from Xi'an NovaStar Tech Co., Ltd. (hereinafter referred to as "Novastar" ). We are pleased to offer this manual to help you understand and use the product.

In the preparation of the manual, we try to make it accurate and reliable. NovaStar may revise and alter the contents of the manual at any time without notice. If you have any problems in the use, or you have any suggestions, please inform us in accordance with the contact provided in this manual. For the problems you encounter in the use, we will do our best to provide support. For your suggestions, we would like to express our thanks and make assessment as soon as possible for adoption.

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## Trademark



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XI'AN NOVASTAR TECH CO., L.

# 1 Safety statement

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Please use this equipment according to the stipulations to avoid possible dangers. In the case of any damage, non-professionals shall not disassemble and repair it without authorization and you shall timely contact after-sales department of this company.

## High voltage

Processor has high voltage and non-professional maintenance personnel shall not open the rear cover to avoid danger.

## Warnings

- 1) Water is strictly prohibited to drop or splash on this equipment and any object containing liquid is strictly prohibited to be placed on this equipment;
- 2) Keep this equipment away from fire sources to prevent fires;
- 3) When this equipment has abnormal sound, smoke or abnormal smell, power plug shall be immediately pulled out.

## Notice

- 1) Please carefully read this instruction before using and properly keeping it for use later;
- 2) If there is lightning or it is not used for a long time, please pull out the power plug;
- 3) This equipment is not suitable for operation and debugging by non-professionals and users must accept guidance from professionals;
- 4) Do not inset any object from vent hole of this equipment to avoid equipment damage or electric shock;
- 5) This equipment shall not be placed in the places near water or other wet places for use;
- 6) This equipment shall not be placed on cooling fins or in other places with high temperature

for use;

- 7) Please properly tidy and place power lines to avoid damage;
- 8) In the case of occurrence of the following circumstance, power plug of this equipment shall be pulled out and repairing shall be entrusted:
  - a) When liquid splashes into this equipment;
  - b) When this equipment falls or the case is damaged;
  - c) When this equipment obviously has abnormal function or change of performance.

Please carefully read the above precautions. If personal safety problem or product damage is caused due to misoperation because you do not follow this instruction, this company will assume no liability!

## 2 Overview

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MCTRL660 is the latest independent master controller of NovaStar, which is mainly applied for display rental service. It supports screen configuration at any time without a computer.

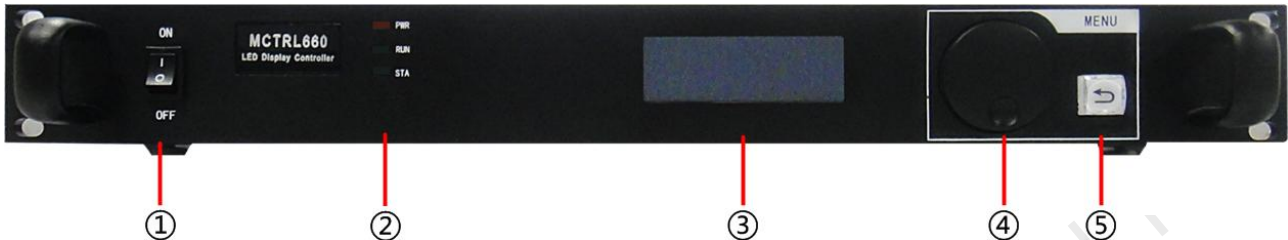
It has the following characteristics:

- 1) It has adopted an innovative design to implement smart configuration and the screen configuration can be completed within 30 seconds;
- 2) It has adopted Nova G4 engine, which makes the screen stable and flicker free without scanning lines. The images become exquisite and bring a good sense of depth;
- 3) It supports Nova's new-generation pixel-by-pixel calibration technology which is fast and efficient;
- 4) It can implement white balance calibration and color gamut mapping based on different features of LEDs used by displays to ensure restoration of true colors;

- 5) It is the only control system supporting the input of 12-bit high-definition multimedia interface (HDMI) and high-bandwidth digital content protection (HDCP) in China;
- 6) It supports screen configuration at any time without a computer;
- 7) It supports manual adjustment of screen brightness, which is convenient and efficient. These features have satisfied the special needs of display rental service to the maximum extent;
- 8) HDMI/DVI Input;
- 9) HDMI/DVI Output;
- 10) HDMI/external audio input;
- 11) 12bit/10bit/8bit HD video source;
- 12) Resolution supported: 2048×1152 , 1920×1200 , 2560×960;
- 13) Resolution supported: 1440×900, (12 bit/10 bit);
- 14) Cascading supported;
- 15) 18 bit gray scale processing and presentation;
- 16) Video format: RGB, YCrCb4:2:2, YCrCb4:4:4.

## 3 Hardware connection

### 3.1 Front panel



① Power indicator ;

② LED Indicator

**PWR:** Power indicator.

**RUN:** Equipment running indicator 1.

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

It blinks normally when the 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:** Equipment running indicator 2. It is steady on when the equipment runs normally.

③: **Operation screen.**

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

⑤: **ESC:** Exit from the current operation or option.



## 3.2 Rear panel



**Notes:** The arrangement of interfaces can be slightly adjusted to enhance user experience. Please in kind prevail.

INPUTS	
AUDIO	Audio INPUT
HDMI IN	HDMI INPUT
DVI IN	DVI INPUT
OUTPUTS	
DVI OUT	DVI OUTPUT
HDMI OUT	HDMI OUTPUT
OUT1~4	4 LED OUTPUTS
CONTROL	
TO PC	Connected to PC , USB Control interface
UART IN、OUT	Cascaded INPUT 、 OUTPUT
POWER	
AC-100-240V-50/60HZ	AC Power interface

## 4 Signal Connection

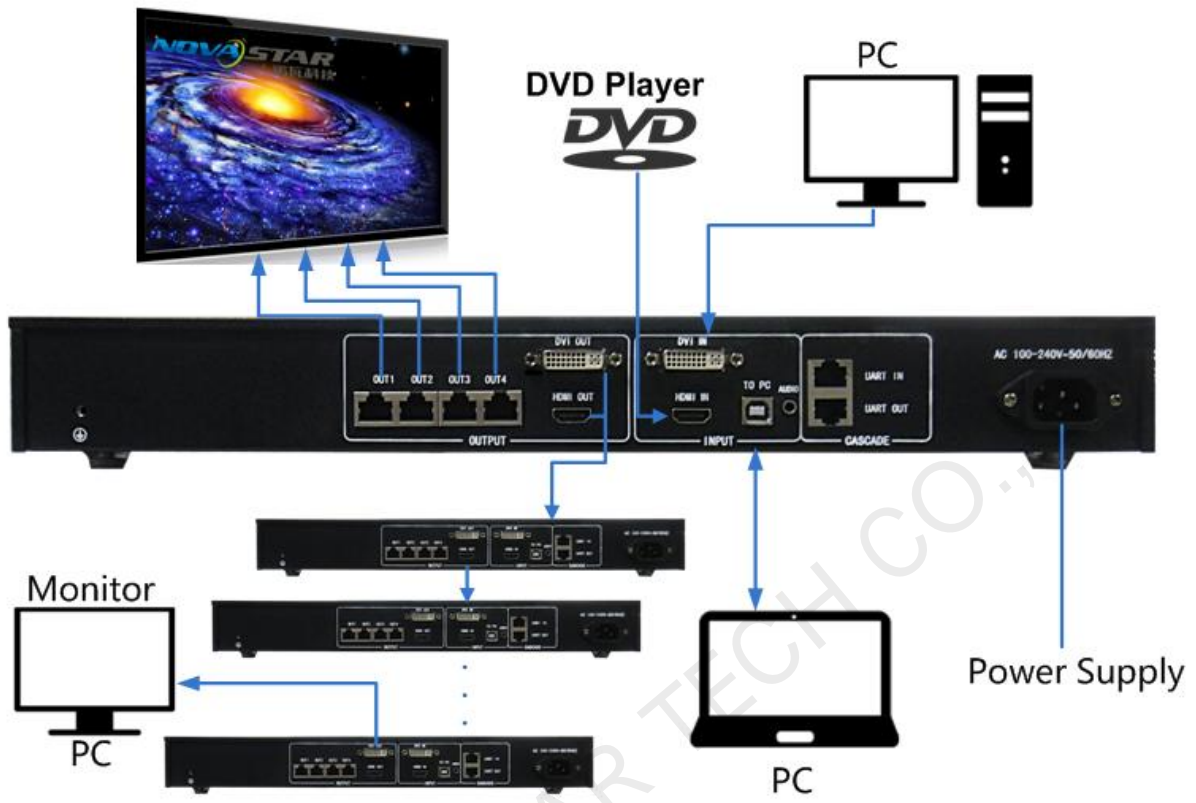


Fig. 4-1 MCTRL660 Signal connection

Connect as follows if it is necessary to control multiple MCTRL660 units simultaneously.

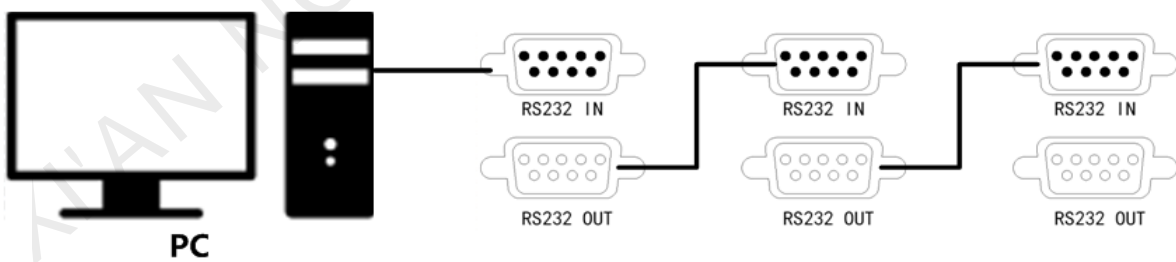


Fig. 4-2 Multi-computer cascade

## 5 Operation Instructions

All the operations of MCTRL660 can be achieved by one knob, one return key, two toggle keys of video source, 3D/2D toggle key and user-defined shortcut key.

### Knob:






- ✧ Press the knob under main interface to enter the operation interface of menu;
- ✧ Rotate the knob to select menu or press the knob under the operation interface of menu to select current menu or enter submenu;
- ✧ Rotate the knob to adjust the parameter after selecting the menu with parameter; 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 OLED display is as follows:



	Indicate access of a video source on the HDMI. It blinks in the case of no video source input
	Indicate that the machine is in the master mode
	LED Output (it is Port 2 output )
	The current brightness is 50%
	Sign of press key lock. When this icon appears at the main interface, it

	is in key and knob function locking state.
<b>EDID Res: 1920x1080@60HZ</b>	Indicate that the resolution is 1920 x 1080 pixels and that the frame frequency is 60 Hz.

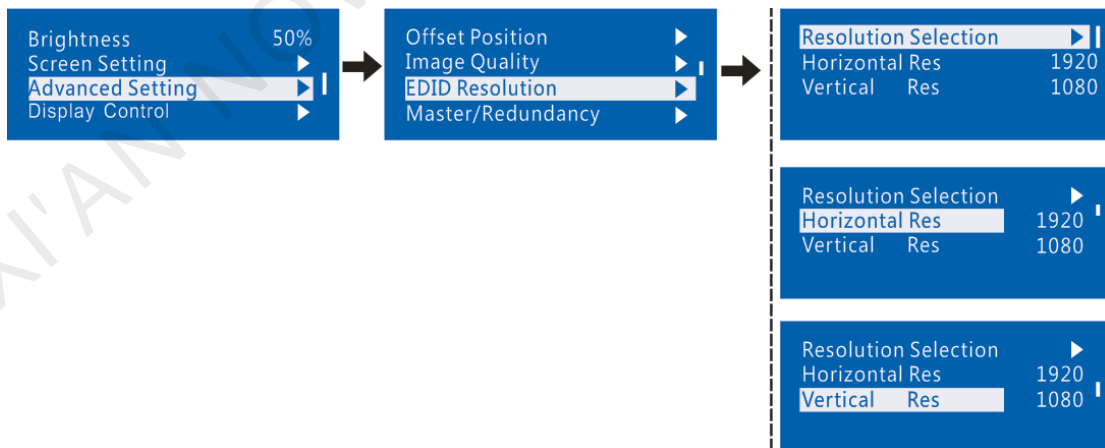
## 7 Procedures

MCTRL660 is powerful and the operation is very simple. In general, the display can be started and normally used after the user complete the first three steps. Other options in advanced setting can be selectively set so as to achieve a better display. Please refer to [7.4 Advanced Setting](#).

### 7.1 Setp1 EDID Resolution Setting

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

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



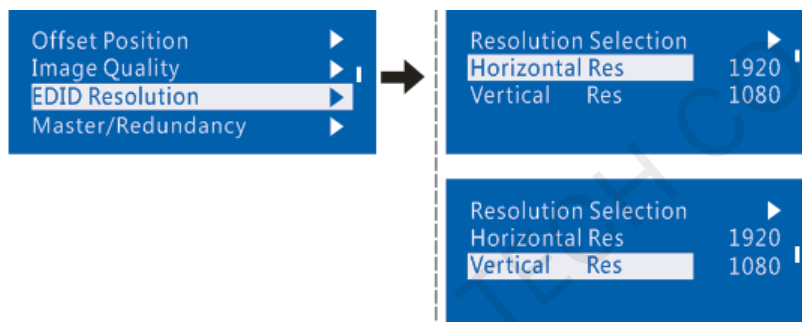
#### Mode 1: Preset resolution setting

Select proper resolution and refresh rate among the standard resolutions preset in controller. If there is no proper preset value, mode 2 user-defined resolution can be selected.



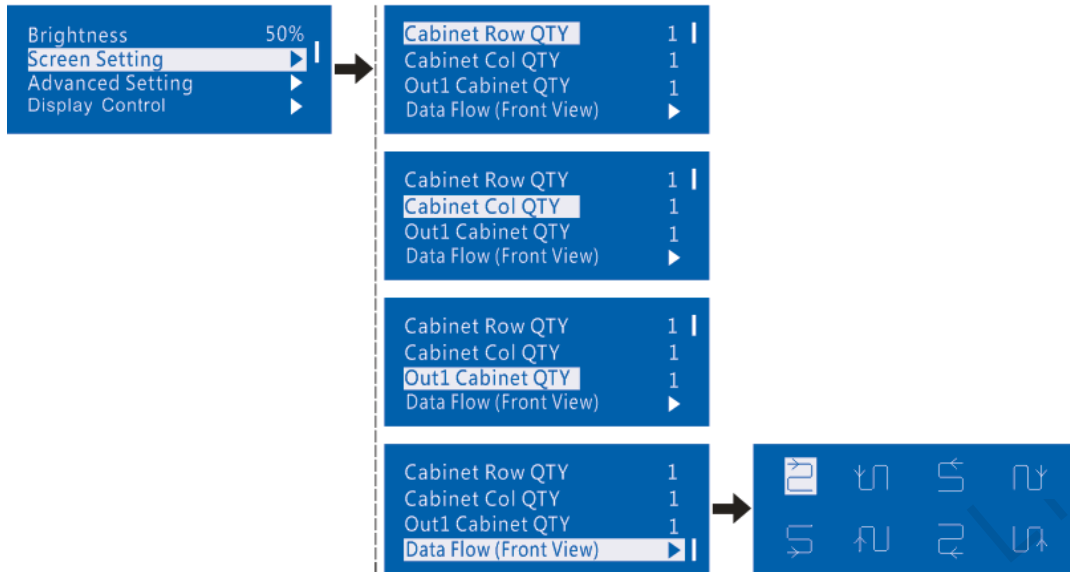
### Mode2: User-defined resolution

Rotate the knob to set user-defined width (gradually increase in even number), height and refresh rate, select "Application" and then press the knob for confirmation. The user-defined resolution cannot work if it is not applied.



## 7.2 Step 2 Screen Setting

- 1) Power on the screen. If the cabinet is in normal display, enter into step 2). If the cabinet is in abnormal display, load the cabinet file first and fix it to the receiving card. See detailed operation in [7.4 Advanced Setting](#) .
- 2) Return to "Screen Setting" submenu. Rotate the knob to switch to submenus of other options respectively to perform configurations, as shown in the following figures:



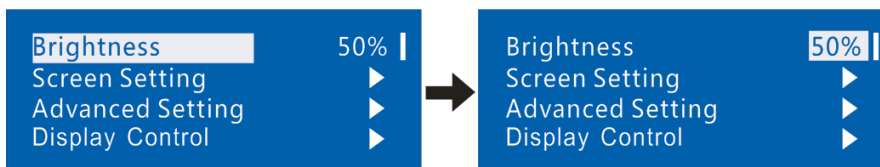
- a) Set **Cabinet Row QTY** and **Cabinet Col QTY** according to the actual situation of the screen;
- b) Set **Cabinet Out1 Num**. The device has some limitations on the cabinet quantity of network interfaces. For details, see precautions for screen setting i);
- c) Set the alignment of the screen. Pay attention to precautions for screen setting iii), iv) and v) below;
- d) Set the EDID resolution of the video source.

<b>Precautions for screen setting:</b>	
<p>i. If the number of network interfaces with loads is <math>n</math> (<math>n \leq 4</math>), the first <math>n-1</math> network interfaces must have the same number of cabinets, which must also be an integral multiple of the number of cabinet rows or columns and be greater than or equal to the number of cabinets for the <math>n</math>th</p>	<p><b>Example:</b> For example, if network interface 1, network interface 2, network interface 3 have loads, network interface 1 and network interface 2 must have the same number of cabinets, which must also be an integral multiple of the number of cabinet rows or columns. Therefore, you need only to set <b>cabinet out1 QTY</b></p>

<p>network interface.</p>	<p>according to the actual situation when setting the screen. The number of receiving cards for network interface 3 must be smaller than or equal to <b>cabinet out1 QTY.</b></p>
<p>ii. In the case of special-shaped cabinets, different cabinet size and special-shaped screen, the NovaLCT-Mars software is required to be connected to configure the screen.</p>	
<p>iii. During connection setting, you can rotate the knob to see the effects of different connections on the screen in real time. If you are satisfied with the connection, you must press the knob to save the setting. You can press the return key to exit from the current operation.</p>	
<p>iv. During connection setting, you must ensure that the connection of each network interface is downward in the same direction.</p>	
<p>v. During connection setting, you must ensure that network interface 1 is the start position of the whole connection.</p>	

### 7.3 Step 3 Adjusting the Brightness of the Screen

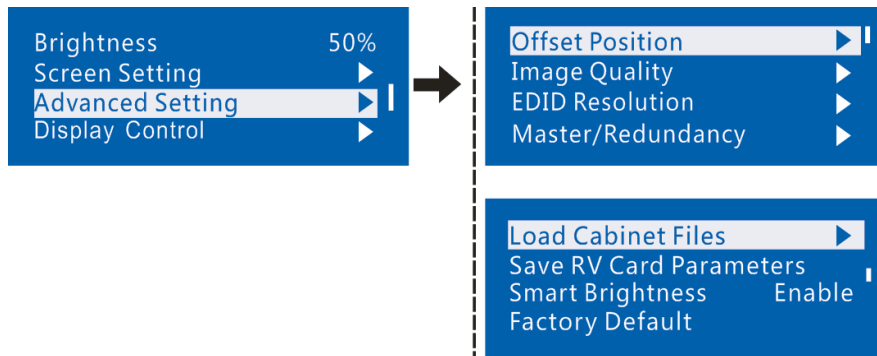
Return to the main menu interface. Press the knob to select the corresponding value. You can rotate the knob to adjust the brightness at this time.



### 7.4 Advanced Setting

Enter the submenu of advanced setting, rotate the knob, and then the user can see the following eight setting options contained in advanced setting. The user can set the parameters by taking the following

items.



### 7.4.1 Offset Position

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



### 7.4.2 Image Quality

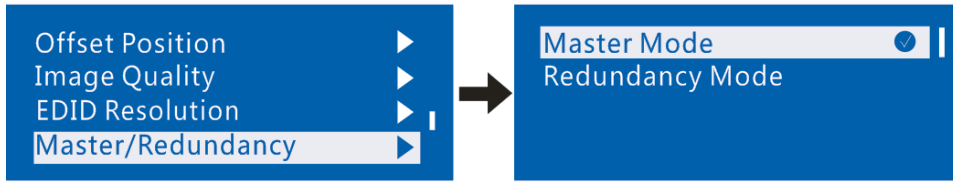
Set Gamma, contrast, saturation, Hue value of image as required. Save these parameters to receiving card by applying "Save RV Card Parameters" after proper adjustment.



### 7.4.3 Master/Redundancy

Set this controller to the master mode or Redundancy mode when the system has multiple controllers.

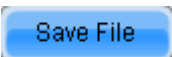


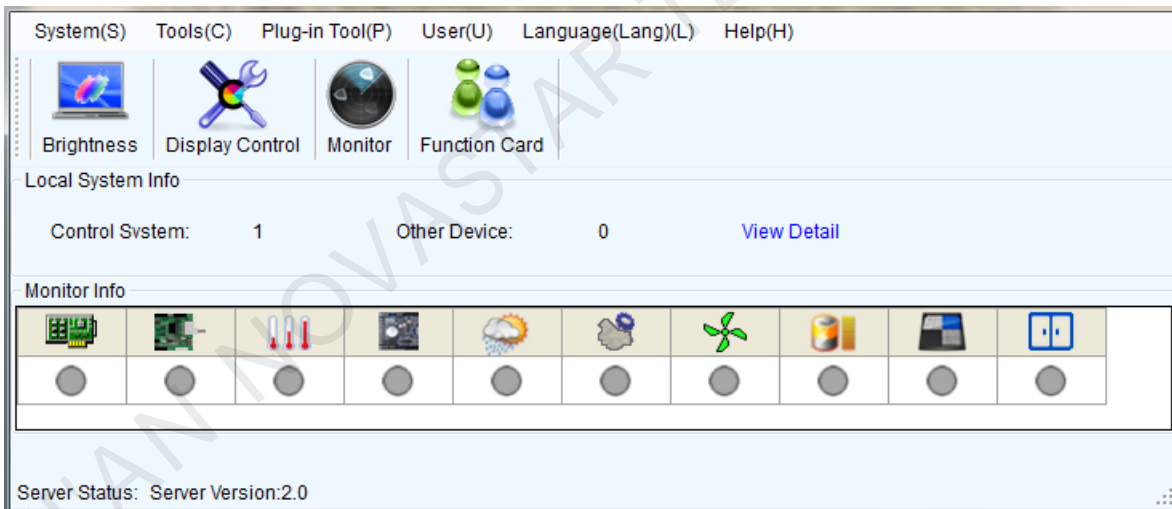


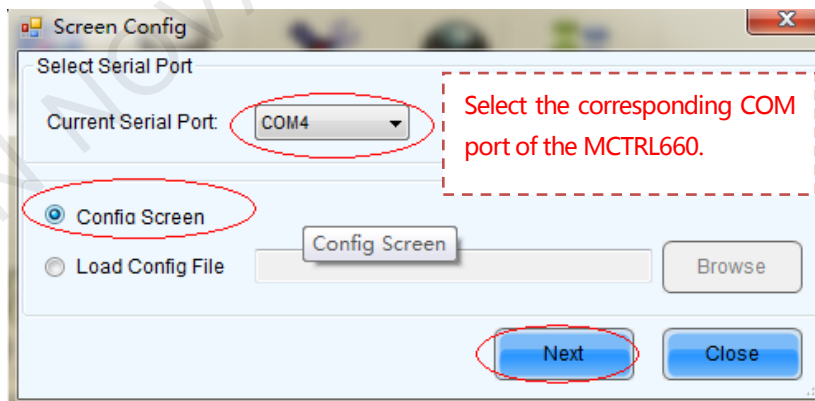
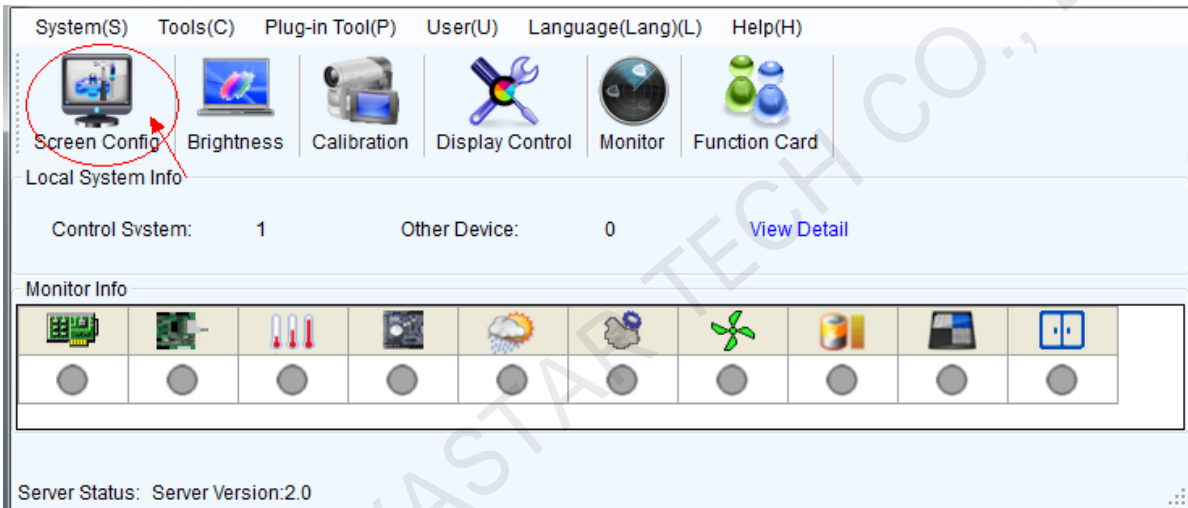
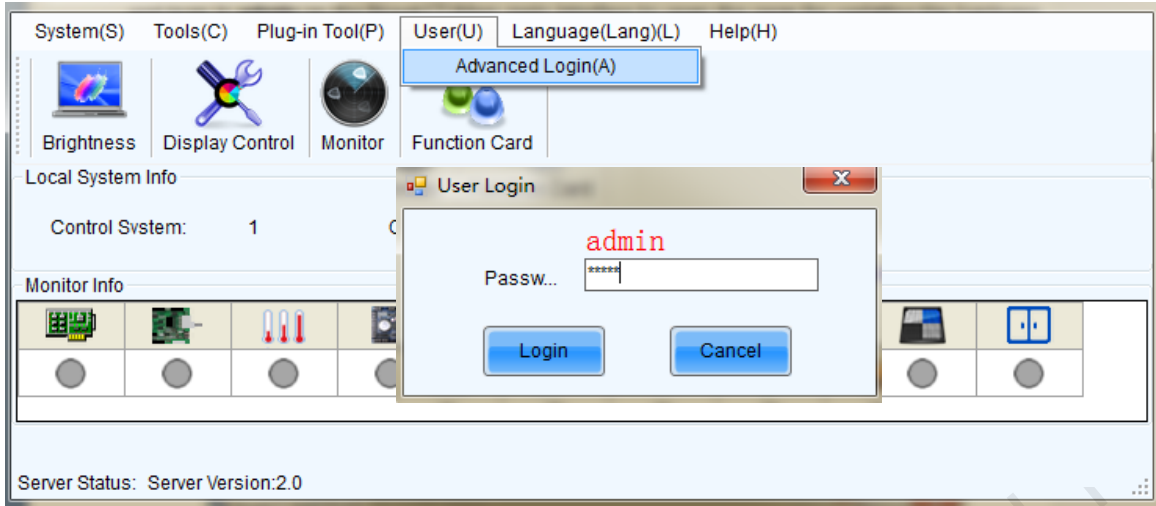
### 7.4.4 Loading Cabinet Files

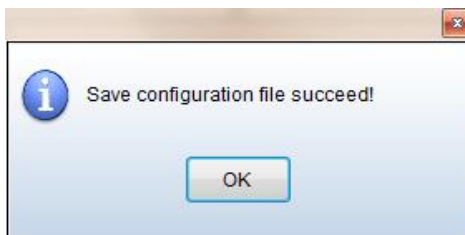
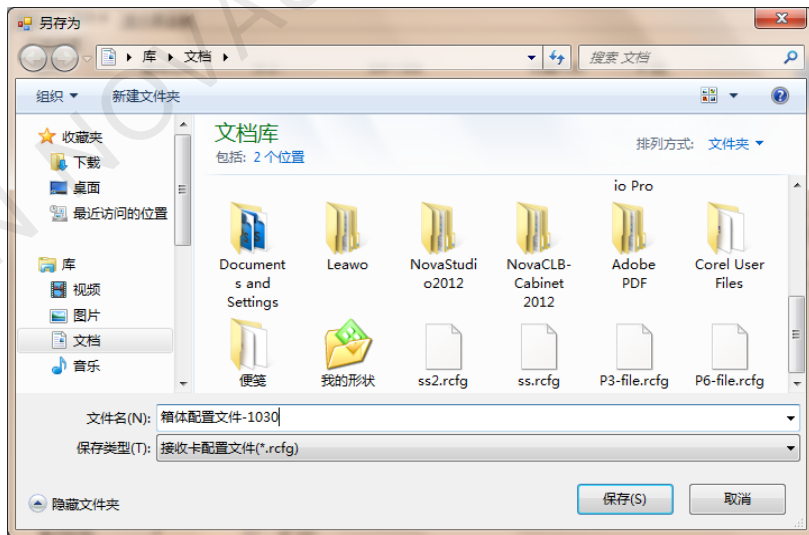
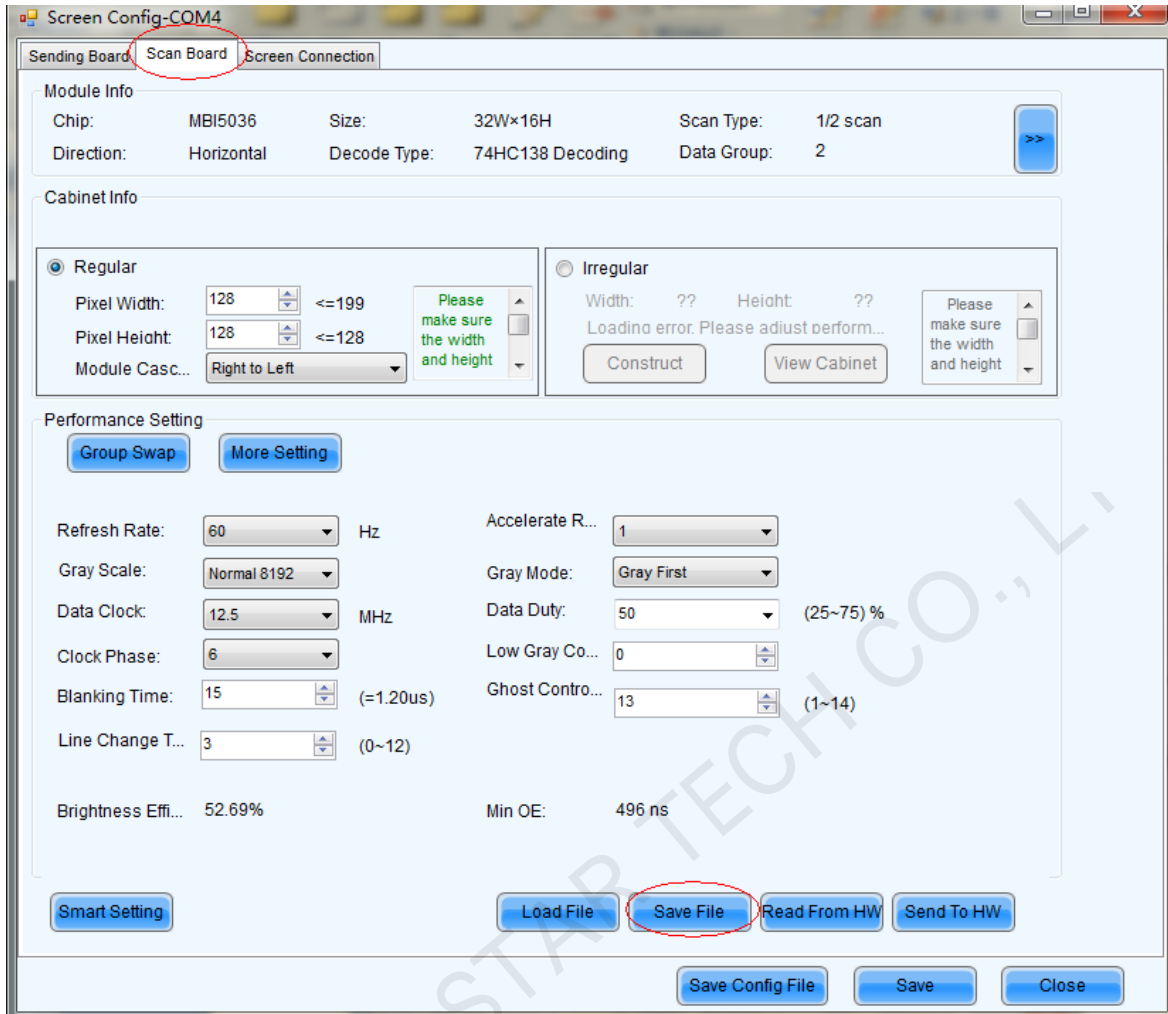
After the screen is powered on, you must load cabinet files first if the cabinet fails to display normally. The cabinet files must be sent to the MCTRL660 through the NovaLCT-Mars beforehand. The following figures show the procedure:

- 1) Save the configuration file of cabinet

Click  to save the configuration file of cabinet (.rcfg) to the local file of PC after the configuration of receiving card has been completed.

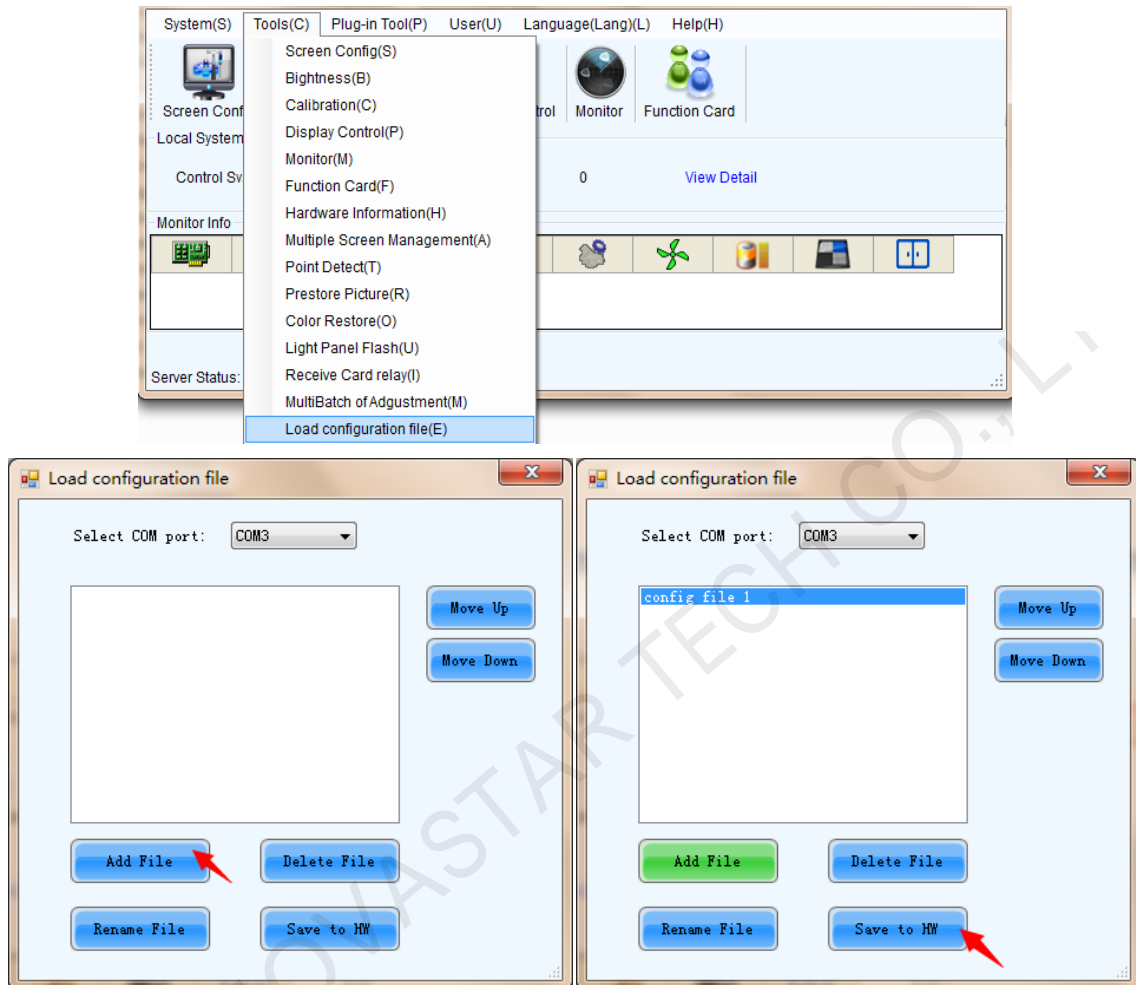






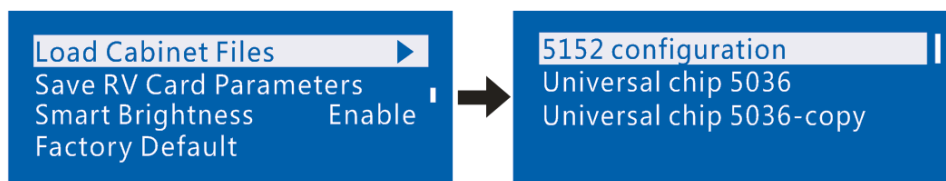
2) Import the configuration file of cabinet into MCTRL660.

The operation steps are as follows:



**Tip:** After the **MCTRL660 Setting** interface is displayed, the NovaLCT-Mars automatically reads the existing configuration files in the MCTRL660. The NovaLCT-Mars can perform operations such as modification of file name, adjustment of file order and deletion to these files.

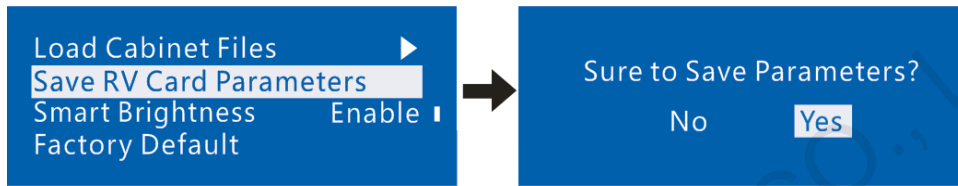
3) Load the configuration file of cabinet



- 4) Save the configuration file of cabinet into receiving card. See detailed operation in [7.4.5 Save RV Card Parameters](#).

### 7.4.5 Save RV Card Parameters

Save the current configuration parameters to the hardware so that the data will not disappear when there is outage.



### 7.4.6 Smart Brightness

This parameter is set to Disable by default. To successfully enable this function, you must load the configuration files first. Currently, only non-pulse-width modulation (PWM) chips are supported.

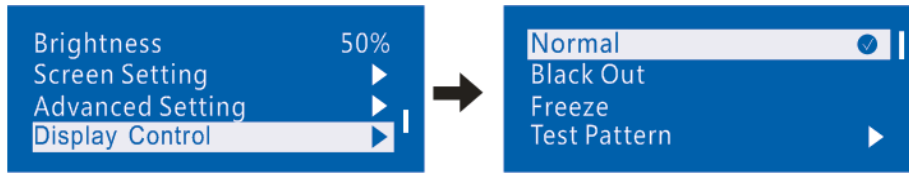


### 7.4.7 Restoring to Factory Settings

Restore to the factory Settings for the MCTRL660.



## 7.5 Display Control



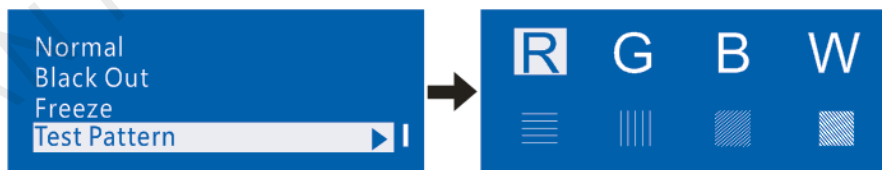
- 1) **Normal:** The screen is restored to normal display.
- 2) **Black Out:** The screen is black out, then the home page display of MCTRL660 operation screen is as follows:



- 3) **Freeze:** Screen freezes, then the home page display of MCTRL660 operation screen is as follows:



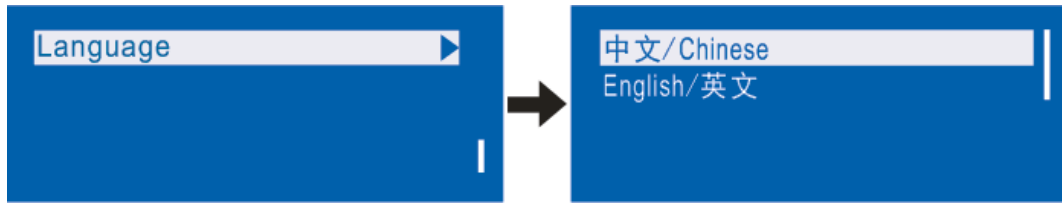
- 4) **Test Pattern:** The screen shall be tested through four colors (red, green, blue and white) and four shapes.



Then the home page display of MCTRL660 operation screen is as follows:

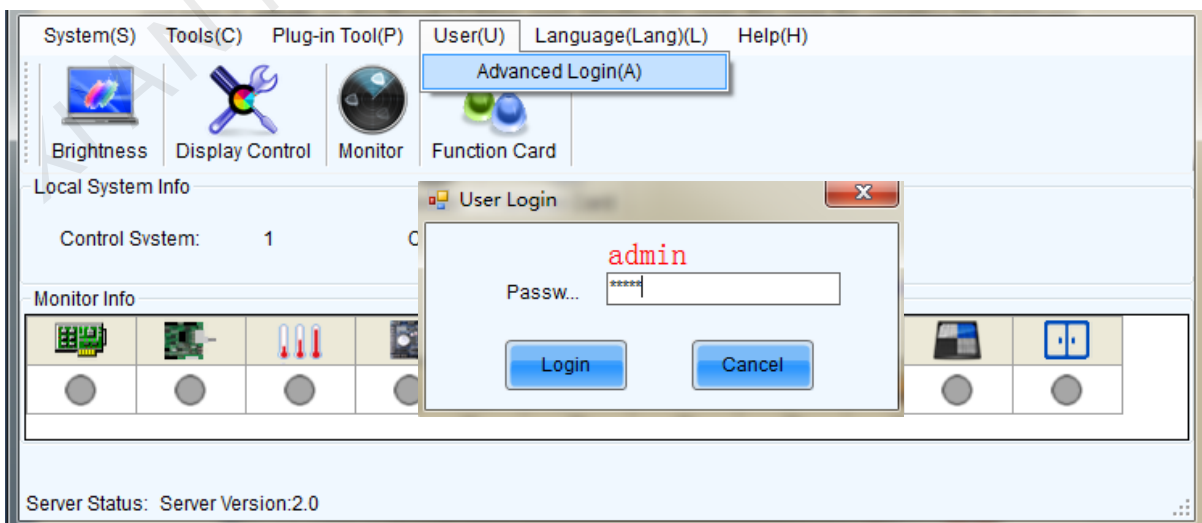
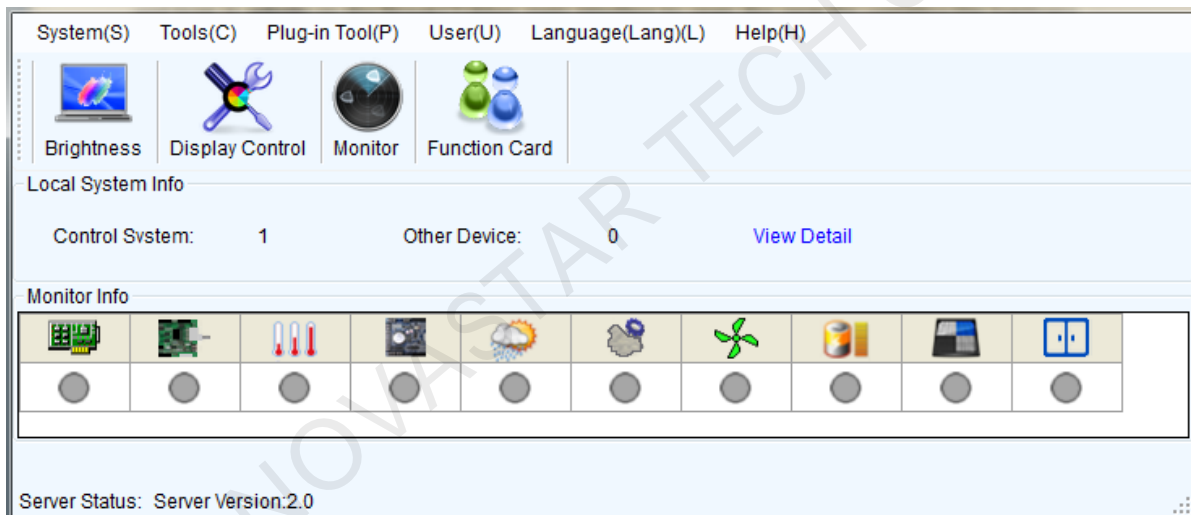


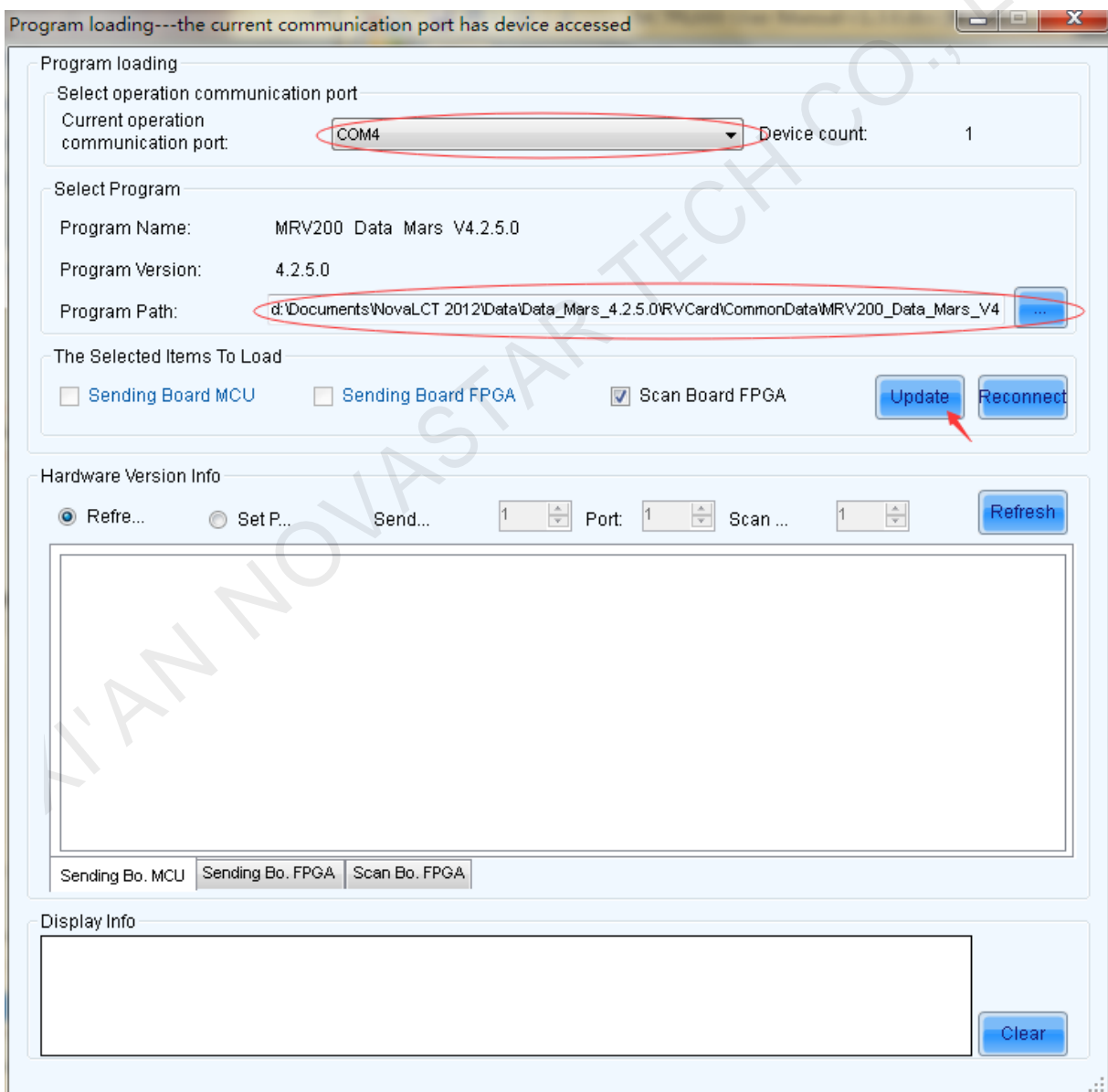
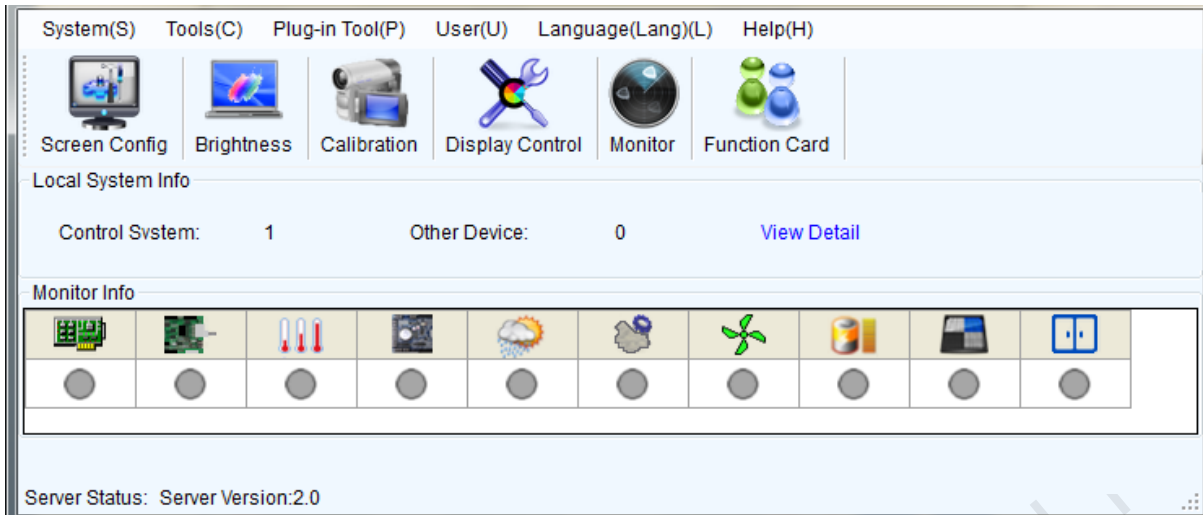
## 7.6 Language Setting



## 8 Hardware Program Updating

Connect MCTRL660 to a computer and run NovaLCT-Mars on this computer. Log in as an advanced user and type in **admin** on the NovaLCT-Mars main interface to open the page for updating the hardware program.







### **Current Serial Port**

Select the serial port through which the hardware to be updated is connected to the computer.

### **Program Path**

Select the program to be loaded to the hardware here.

### **Sending Board MCU**

Select this option if the MCU program of a sending board is to be updated.

### **Sending Board FPGA**

Select this option if the FPGA program of a sending board is to be updated.

### **Scan Board FPGA**

Select this option if the FPGA program of a scan board is to be updated.

### **Update**

Click this button to load the selected program to the selected hardware.

### **Refresh All**

If this option is selected, the version information of all sending boards and scan boards connected to the current serial port will be refreshed when the **Refresh** button is clicked.

### **Set position**

If this option is selected, only the version information of the selected scan board will be refreshed when the **Refresh** button is clicked.

### **Refresh**

Click this button to show the current version information of the hardware. This can be used to check whether the hardware program has been updated.

## 9 FAQ and Precautions

Questions	Solutions
LED display is off	<p>Inspect whether the power connection is correct and the switch has been turned on;</p> <p>Type to test the image and confirm whether the connection of LED is correct and works normally;</p> <p>Inspect whether MCTRL660 output has signal and shows blank screen;</p> <p>Inspect whether the mode and parameter of screen configuration are correct;</p>
Considerations	<p>1) The product can only support configuration without computer for rectangular screen composed of cabinets of same size and specification; special-shaped cabinet and screen need online configuration.</p> <p>2) Offline and online operation cannot be conducted for the same screen.</p>

## 10 Specifications

Input index		
Interface	Number	Resolution specification
DVI	1	VESA standard (supporting 1080i input); supporting HDCP
HDMI	1	EIA/CEA-861 standard; meeting HDMI-1.3 standard; supporting HDCP

Output index		
Interface	Number	Resolution specification

DVI	1	Corresponding with DVI input
HDMI	1	Corresponding with HDMI input

<b>Overall Specifications</b>	
Input power	AC 100-240V, 50/60Hz
Overall power consumption	16W
Temperature of working environment	-20~60°C
Humidity of working environment	0%~95%
Net weight	3.9 Kg
USB Cable	1.5M
DVI Cable	1.5M

## 11 Installation Dimensions

19" 1U Standard cabinet. (Unit: mm)

