MBOX600 Pro

Industrial Controller

User Manual

Contents

1 Introduction

The MBOX600 Pro Industrial Controller, used with VNNOXCare Configuration, can achieve cabinet configuration, device configuration, screen connection, brightness control, alarm and monitoring configuration, as well as device and cabinet maintenance features. The MBOX600 Pro supports both Linux and Windows operating systems.

The MBOX600 Pro, used with VNNOXCare Configuration, offers flexible control and convenient application in all scenarios. This matching solution has comprehensive expansion capabilities. It provides a powerful Server, and unleashes the full capacity of the system. These features of the matching solution aims to meet users' needs for differentiated secondary development and innovation.

The MBOX600 Pro has system monitoring and management capabilities of the SNMP, suitable for users of advertising media display field.

2 Login

Prerequisites

- To ensure the normal operating of the system feature, it is recommended to use the latest version of Google Chrome.
- Simultaneous login by multiple users is not supported for a single account. If User A is already logged in and User B logs in to the same account, User A will be automatically logged out. A prompt will appear saying **The device is already logged in by another user. If you want to control the device, please log in again**.

2.1 Local Login

Operating Procedure

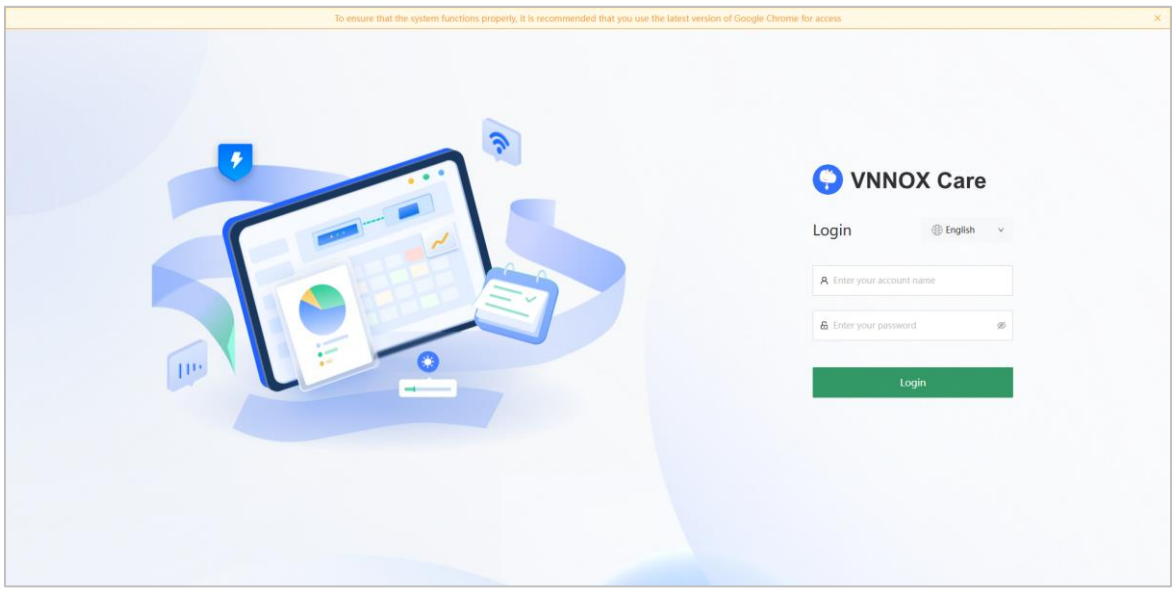
Step 1 Connect the MBOX600 Pro with a display, a keyboard and a mouse.

Step 2 Enter “127.0.0.1” in your browser to access the application.

Step 3 Enter the user name and password. (The default user name is “admin” and the default password is “SN2008@+”.)

Step 4 Click **Login**.

Figure 2-1 Login



2.2 External PC Login

Operating Procedure

Step 1 Connect the MBOX600 Pro with the PC.

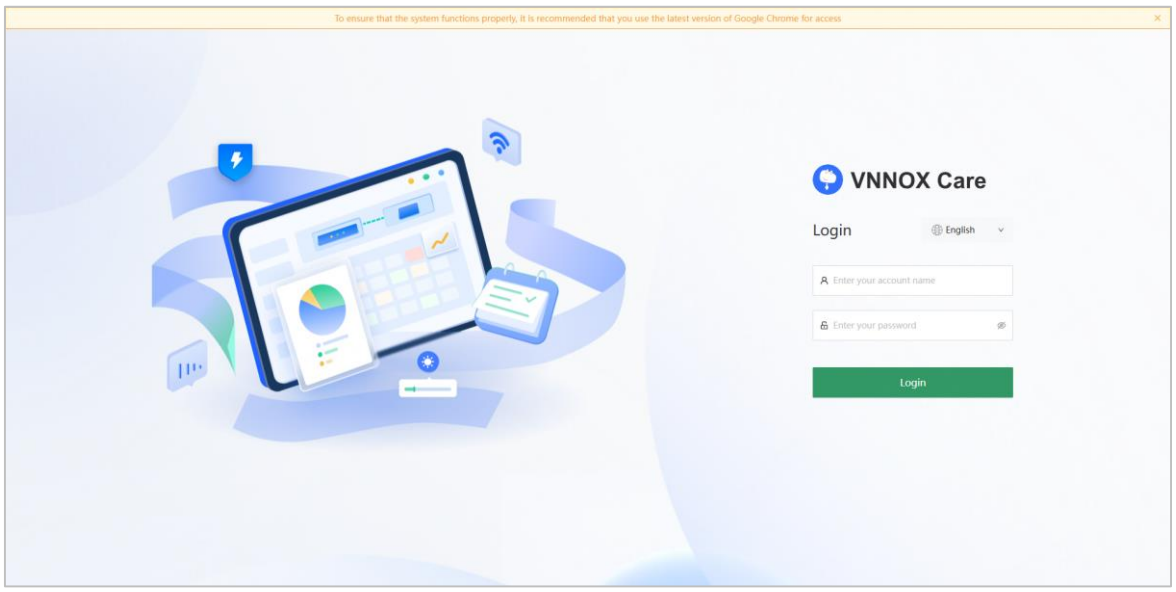
- Ethernet cable: Connect the PC to the CONFIG Ethernet port on the front panel of the MBOX600 Pro.
- LAN: The PC and the MBOX600 Pro are connected to the same LAN via a router.

Step 2 Enter “192.168.0.10” in your browser to access the application.

Step 3 Enter the user name and password. (The default user name is “admin” and the default password is “SN2008@+”.)

Step 4 Click **Login**.

Figure 2-2 Login



Notes:

- When the device and computer are connected with an Ethernet cable, the IP address of the computer needs to be set to 192.168.0.xxx.
- The CONFIG Ethernet port has a static IP of “192.168.0.10”.
- Connect the MBOX600 Pro to the router via the ETHERNET port on the rear panel.

3 Home

After successful login, go to the homepage to view device and screen information.

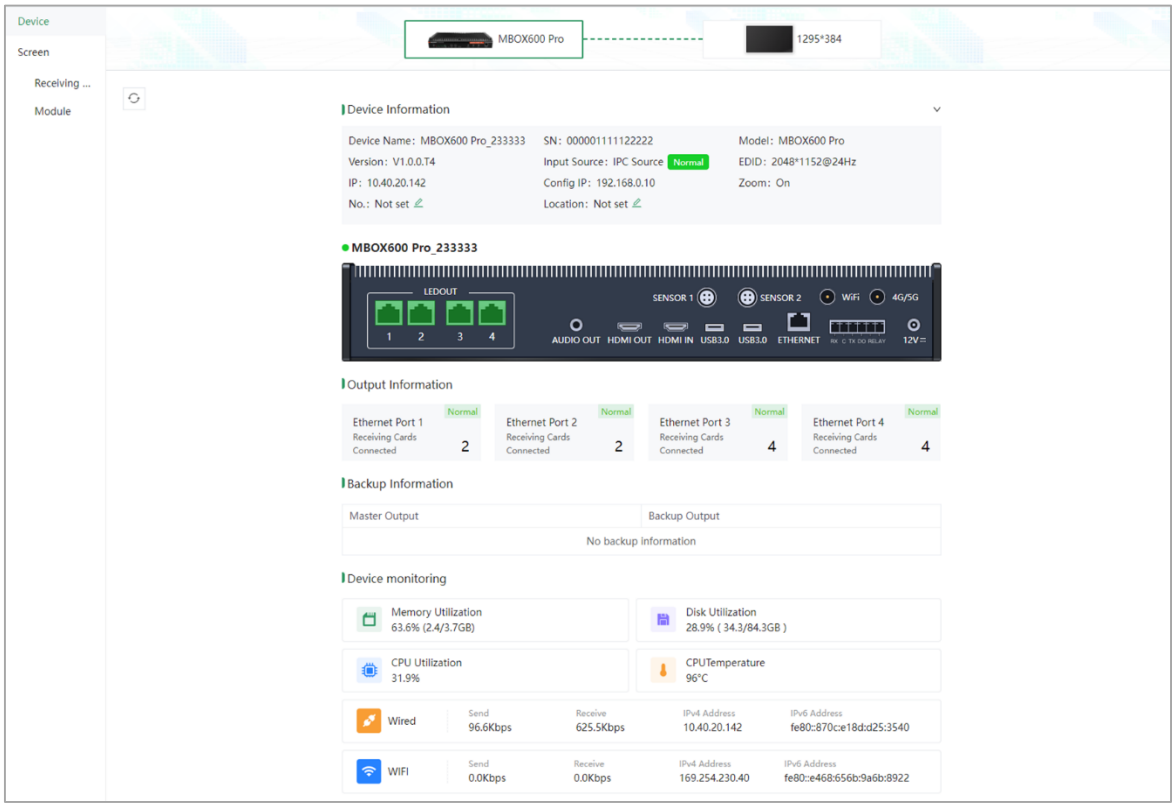
Precautions

Parameter settings in the software take time to solidify. To ensure the parameter settings take effect, avoid powering on, powering off or restarting the device within 30 seconds after issuing commands.

3.1 Device

On the homepage, enter the **Device** tab to view device information, rear panel, Ethernet port output information, Ethernet port backup information, and device monitoring information.

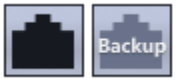
Figure 3-1 Device



Note:

If "Backup" is displayed on an Ethernet port icon, it indicates that the Ethernet port is a backup port.

Table 3-1 Ethernet port status

Ethernet port status	Description
	No Ethernet port is specified as the backup port of the current Ethernet port and the current Ethernet port is working normally.
	A backup relationship is established between the two Ethernet ports. Both the master and backup ports are working normally.
	No Ethernet port is specified as the backup port of the current Ethernet port. The current Ethernet port is connected but not in use.
	No Ethernet port is specified as the backup port of the current Ethernet port. The current Ethernet port is disconnected.
	A backup relationship is established between the two Ethernet ports. Both the master and backup Ethernet ports are connected but not in use.
	A backup relationship is established between the two Ethernet ports. The master Ethernet port is connected but not in use. The backup Ethernet port is disconnected.
	A backup relationship is established between the two Ethernet ports. The master Ethernet port is disconnected. The backup Ethernet port is connected but not in use.
	A backup relationship is established between the two Ethernet ports. Neither the master nor the backup Ethernet ports are connected, and they are not in use.
	A backup relationship is established between the two Ethernet ports. The connection between receiving cards is disconnected. Both the master and backup Ethernet ports are in alarm status. The screen is working normally.
	A backup relationship is established between the two Ethernet ports. The master Ethernet port is in alarm status. The backup

Ethernet port status	Description
	Ethernet port is disconnected. The screen is working normally.
	A backup relationship is established between the two Ethernet ports. The master Ethernet port is disconnected. The backup Ethernet port is in alarm status. The screen is working normally.
	No Ethernet port is specified as the backup port of the current Ethernet port. There is at least one offline cabinet on the topology connected to the Ethernet port.
	No Ethernet port is specified as the backup port of the current Ethernet port. The Ethernet port is disconnected. There is at least one offline cabinet on the topology connected to the Ethernet port.
	A backup relationship is established between the two Ethernet ports. The master Ethernet port is in abnormal status. The backup Ethernet port is disconnected. There are black areas on the screen. There is at least one offline cabinet on the topology connected to the Ethernet port.
	A backup relationship is established between the two Ethernet ports. Both the master and backup Ethernet ports are in abnormal status. There are black areas on the screen. There is at least one offline cabinet on the topology connected to the Ethernet port.
	A backup relationship is established between the two Ethernet ports. The master Ethernet port is disconnected. The backup Ethernet port is in abnormal status. There are black areas on the screen. There is at least one offline cabinet on the topology connected to the Ethernet port.
	A backup relationship is established between the two Ethernet ports. Neither the master nor the backup Ethernet ports are connected, and they are in abnormal status. There are black areas on the screen. There is at least one offline cabinet on the topology connected to the Ethernet port.

3.2 Screen

3.2.1 Receiving Card

On the homepage, select **Screen** > **Receiving Card** to view working status, temperature, voltage, fault information, alarm information of the receiving card and basic screen information.

Figure 3-2 Working status

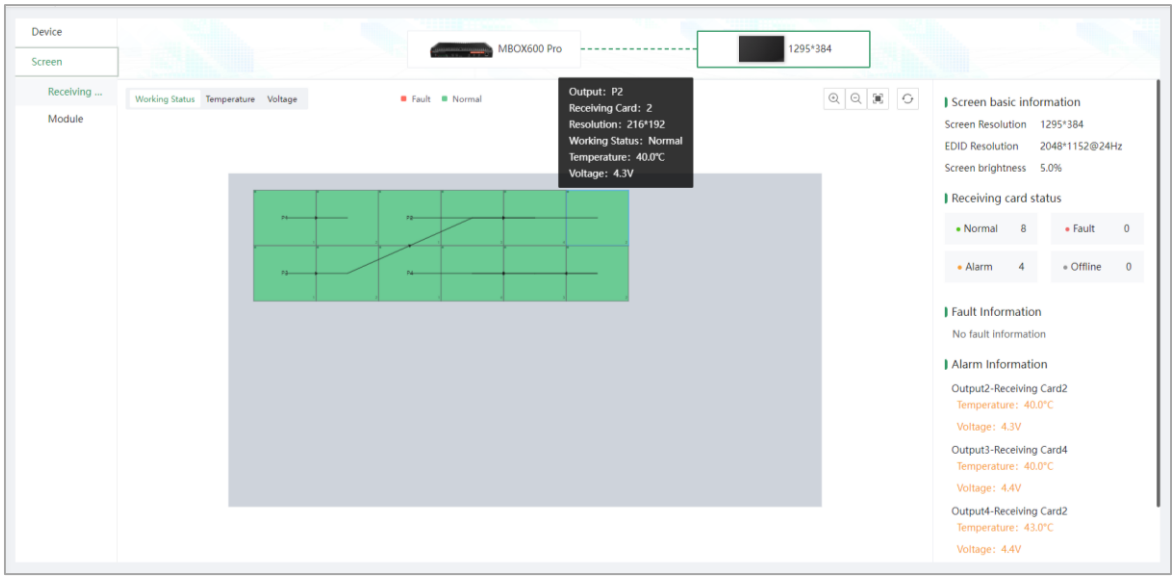


Figure 3-3 Temperature

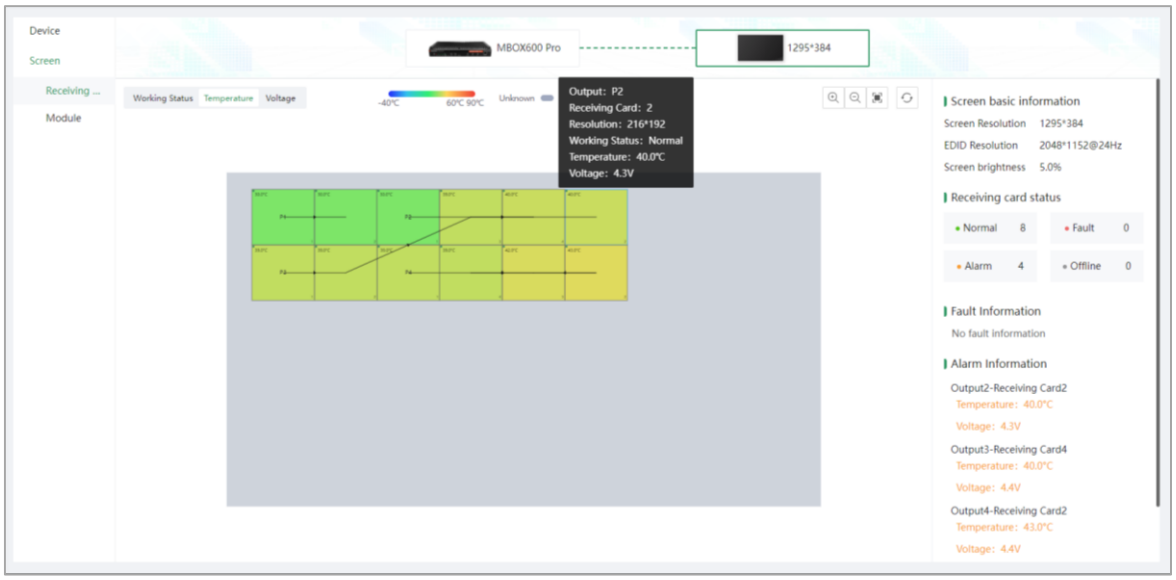
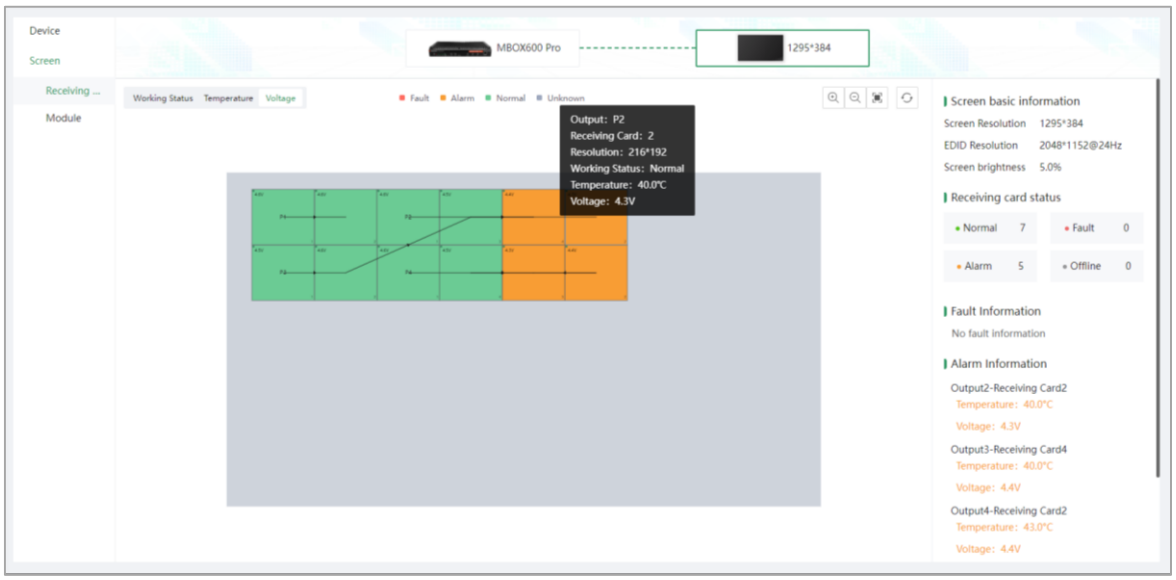


Figure 3-4 Voltage



3.2.2 Module

On the homepage, select **Screen** > **Module** to view working status, temperature, voltage, module ID, run time, fault information, alarm information of the module and basic screen information.

Note:

The module information only of smart modules can be displayed. The module information of non-smart modules cannot be accessed.

4 Screen Configuration

4.1 Device Configuration

On the **Device Configuration** page, users can set the source type, EDID, zoom and redundancy settings.

Step 1 From the navigation bar on the left, choose **Screen Configuration**.

Step 2 Select the **Device Configuration** tab.

Figure 4-1 Device configuration

Step 3 Set the parameters below as needed.

- Select the input source type as either IPC source or HDMI source. (This selection synchronizes with the effect of pushing the SOURCE button on the device.)
- Set the EDID parameters and click **Apply**.
  - Resolution: Select a preset resolution from the drop-down menu, or customize the resolution (the resolution range is from 800*600 to 2048*1152).
  - Frame rate: Select the preset frame rate from the drop-down menu.
- Enable **Zoom**, set the zoom parameters and click **Apply**.
  - Auto zoom: Zoom the input source to match the screen configuration size.

- Custom: Customize the zoom width and height. (Width and height range is from 64 to 4096. The width must be set to an even number, and width × height ≤ 2.6 million.)

- Set the redundant backup information and click **Apply**.
  - New: Create a backup relationship.
  - Edit: Edit the serial number of the master and backup outputs.
  - Delete: Delete the backup relationship.

4.2 Screen Connection

Configure the cabinet topological to complete the logical connection of cabinets.

Prerequisites

- The cabinet supports free connection.
- The top-left corner of the canvas is at coordinates (0, 0).
- When configuring redundant backup, it is recommended to use a loop connection of cabinets and complete the redundancy settings before connecting cabinets.

Step 1 From the navigation bar on the left, choose **Screen Configuration**.

Step 2 Select the **Screen Connection** tab.

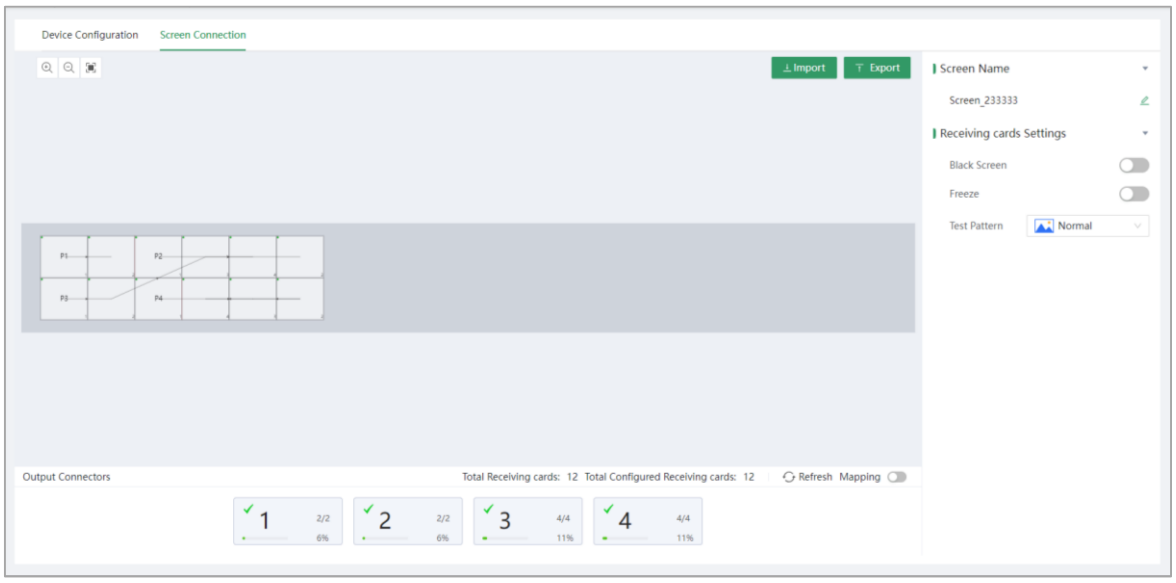
Step 3 Turn on Mapping to view the actual connection and then complete cabinet connection according to the actual information.

Step 4 At the bottom of the page, select an output Ethernet port and drag the corresponding number of cabinets to the canvas.

The cabinets will be automatically connected when you are adding them.

Step 5 Select another Ethernet port and continue adding cabinets until all cabinets are connected.

Figure 4-2 Screen configuration



Note:

To delete a cabinet, select the cabinet and press **Delete** on the keyboard.

Table 4-1 Icon description

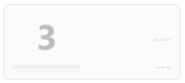
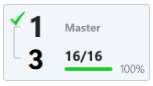
Ethernet port		Cabinet	
Icon	**Description**	**Icon**	**Description**
	✓: Configuration complete		: The cabinet is online and inside the canvas.
	1: Ethernet port 1 is connected.		P1: The sequence number of the Ethernet port is 1.
	10/10: 10 cabinets are configured. / 10 cabinets are recognized normally.		1: The sequence number of the cabinet is 1.
	——100%: 100% of the loading capacity is being used.		
	Ethernet port 2 is overloaded.		: Part of the cabinet is outside the canvas.
	Ethernet port 3 is not connected.		: The entire cabinet is outside the canvas.
	The backup of Ethernet port 1 is Ethernet port 3.		: The cabinet is offline.

Table 4-2 Feature description

Feature	Description
	Zoom in/Zoom out/Zoom to fit
Import	Import screen configuration files which can be used to quickly configure screens or recover a faulty screen.
Export	Export the current screen configuration information on the canvas, which can be used to quickly configure screens or recover a faulty screen.
Refresh	Obtain the Ethernet port status again.
Mapping	Turn on Mapping to view the actual cabinet connection.
Black Screen	Display a black screen.
Freeze	Freeze the current frame of the output image.
Test Pattern	Use test patterns of the receiving card for display testing and troubleshooting.

Note:

- Cabinet feature priority: Black Screen = Freeze > Test Pattern
- **Black Screen** and **Freeze** cannot be turned on simultaneously.

5 Brightness Control

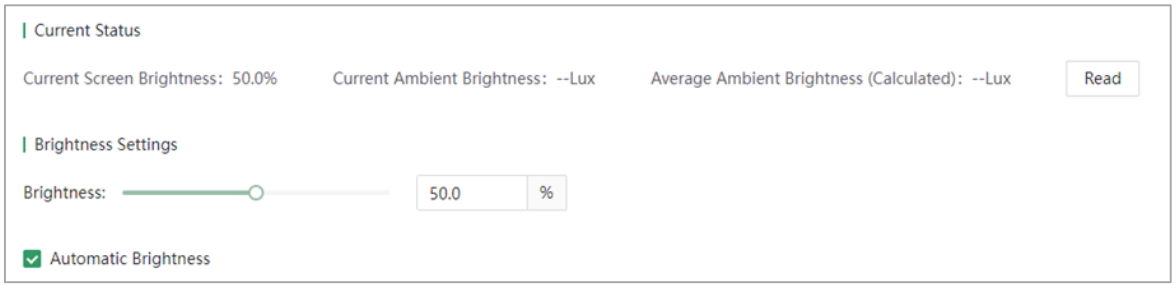
5.1 Manual Brightness Adjustment

Step 1 From the navigation bar on the left, choose **Brightness Control**.

Step 2 Drag the brightness slider or enter a brightness value.

The screen brightness changes in real time.

Figure 5-1 Manual brightness adjustment



5.2 Automatic Brightness Adjustment

Step 1 From the navigation bar on the left, choose **Brightness Control**.

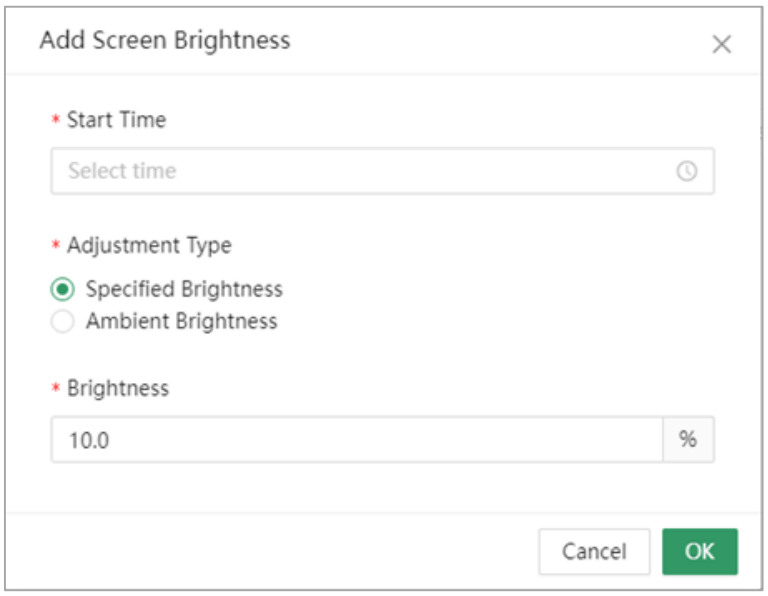
Step 2 Select **Automatic Brightness**.

Step 3 Click **Add** and select a **Start Time**.

Step 4 Select an adjustment type.

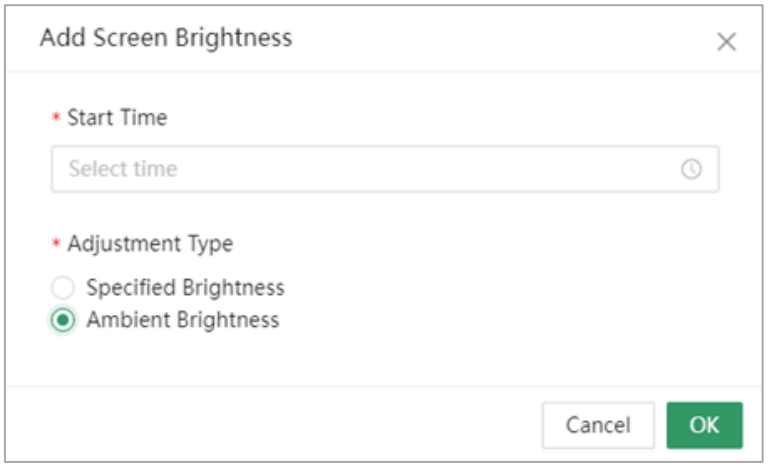
- Select **Specified Brightness**, enter a brightness value, and click **OK**.

Figure 5-2 Specified brightness



- Select **Ambient Brightness** and click **OK.** (This feature is available only when a light sensor is connected to the device.)

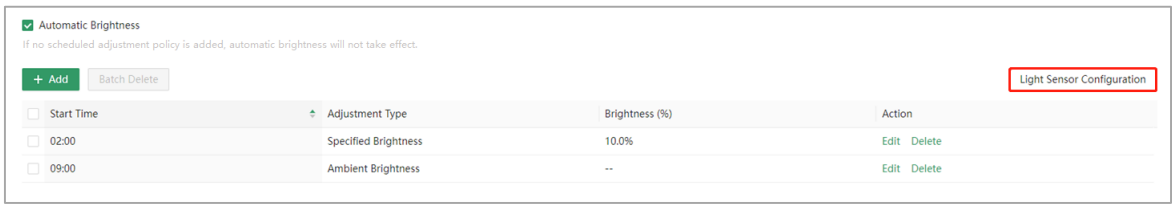
Figure 5-3 Ambient brightness



Step 5 Configure the light sensor. (Perform this step if **Ambient Brightness** is selected as **Adjustment Type**, otherwise skip this step.)

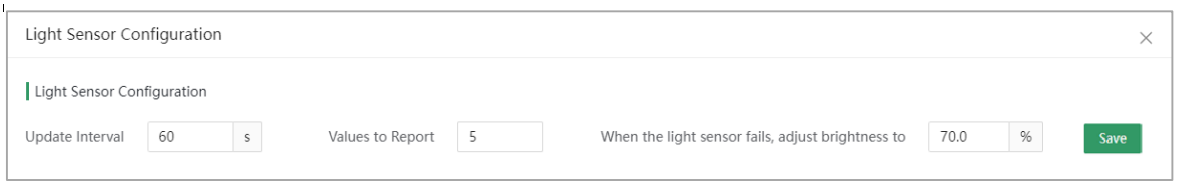
1. Connect the aviation plug of the ALP050 or NS060 light sensor to SENSOR1 or SENSOR2 connector on the MBOX600 Pro.
2. Click **Light Sensor Configuration**.

Figure 5-4 Light sensor configuration



3. Specify an update interval, number of values to report, and the screen brightness when the light sensor fails, then click **Save**.

Figure 5-5 Configuring the light sensor



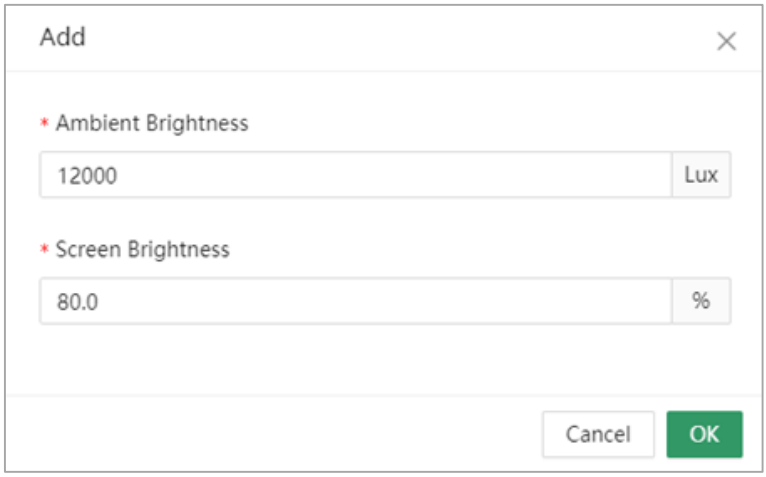
4. Add a brightness mapping table.

   There are several ambient brightness ranges in a brightness mapping table and a screen brightness value is specified for each range. The screen brightness changes according to the range of the measured ambient brightness. For example: the corresponding screen brightness range of the ambient brightness range [2000 Lux, 12000 Lux] is set to [40.0%, 80.0%].

   - Add mapping relations manually.

     Click **Add** to specify an ambient brightness and the corresponding screen brightness.

Figure 5-6 Adding mapping relations manually

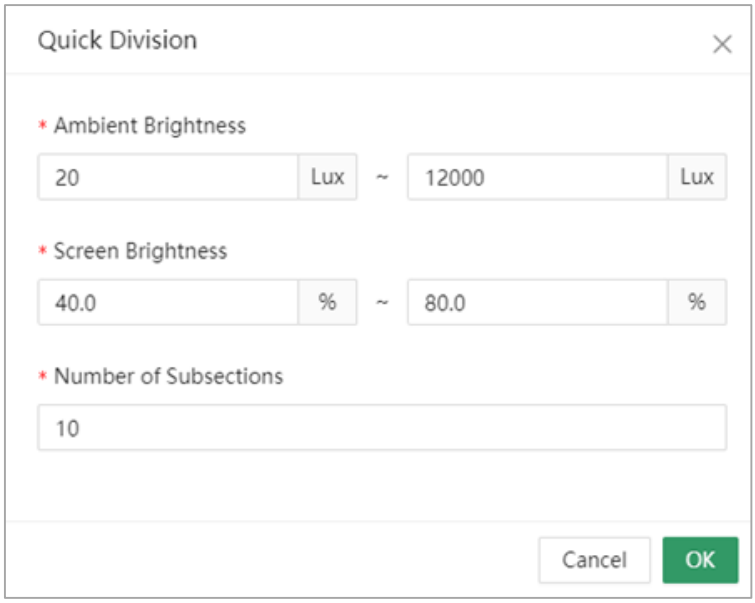


   - Quick division

a. Click **Quick Division** and specify an ambient brightness range, screen brightness range and the number of subsections (up to 20 subsections are supported).

b. Click **OK**.

Figure 5-7 Quick division



c. If there are already mapping relations in the brightness mapping table, the relations will be cleared after you click **OK**.

Notes:

- A maximum of 30 automatic brightness adjustment rules can be added.
- **Automatic Brightness** is turned off by default.
- When a light sensor is connected and no scheduled adjustment policy has been added, screen brightness adjustment will follow the rules specified in **Light Sensor Configuration** after enabling **Automatic Brightness**.

6 Rule Configuration

6.1 Alarm Rules

When a receiving card or module fails to work correctly, the system uses the default alarm rules to report different grades of alarms for the failure, and the alarm information can be viewed in **Screen Monitoring**. Users can also customize alarm thresholds and alarm rules according to different devices and application scenarios.

Default Alarm Rules

Type	Grade	Default Trigger Condition
Temperature	Normal	-20°C≤Temperature<+80°C
	Alarm	-30°C≤Temperature<-20°C
		+80°C≤Temperature<+90°C
	Fault	Temperature<-30°C
		Temperature≥+90°C
Voltage	Normal	3.3 V≤Voltage<5.5 V
	Alarm	3.2 V≤Voltage<3.3 V
		5.5 V≤Voltage<6.0 V
	Fault	Voltage<3.2 V
		Voltage≥6.0 V

Configure Alarm Rules

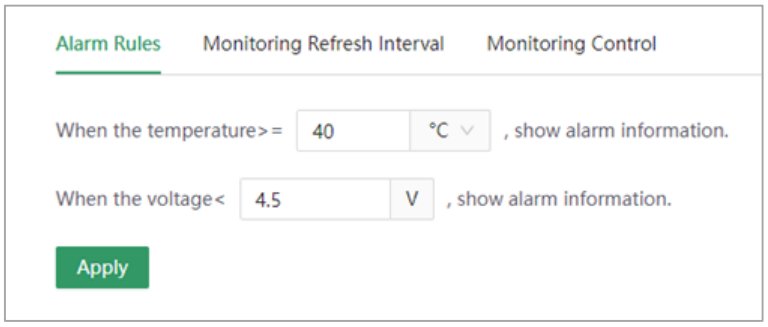
Step 1 From the navigation bar on the left, choose **Rule Configuration**.

Step 2 Select the **Alarm Rules** tab.

Step 3 Specify a temperature range (the unit can be °C or °F. 1°C=33.8°F) and voltage range, and click **Apply**.

Temperature range: 0℃~80℃, voltage range: 3.3 V~5.0 V

Figure 6-1 Alarm rules



6.2 Monitoring Refresh Interval

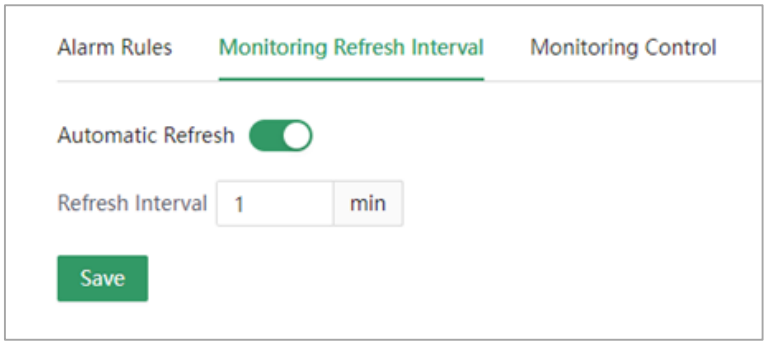
Turn on **Automatic Refresh** and specify a refresh interval. The system will automatically refresh the monitoring information at the specified interval.

Step 1 From the navigation bar on the left, choose **Rule Configuration**.

Step 2 Select the **Monitoring Refresh Interval** tab.

Step 3 Turn on **Automatic Refresh** (turned off by default) and specify a refresh interval (range: 1 min to 10 min).

Figure 6-2 Monitoring refresh interval



Note:

Please ensure that **Automatic Refresh** is enabled, otherwise it will affect the SNMP feature.

6.3 Monitoring Control

Turn on **Monitoring Control**. When the maximum/average temperature of the receiving card is within a certain range, the screen brightness is automatically adjusted to the specified value.

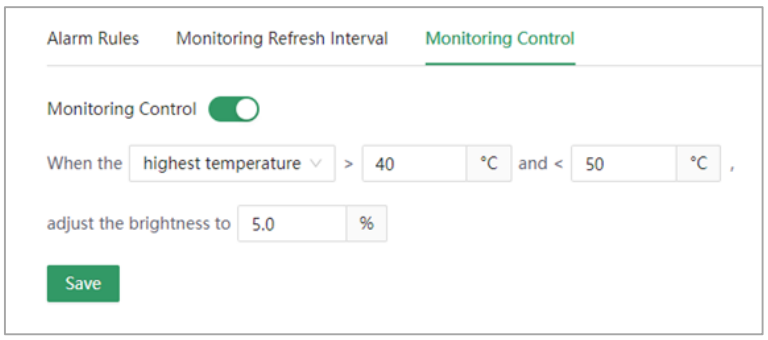
Step 1 From the navigation bar on the left, choose **Rule Configuration**.

Step 2 Select the **Monitoring Control** tab.

Step 3 Select a temperature type (maximum temperature/average temperature), specify a temperature range and brightness.

Step 4 Click **Save** to complete the configuration.

Figure 6-3 Monitoring control



Note:

- If the automatic brightness adjustment is currently enabled, it will be disabled once the temperature-controlled brightness policy takes effect, and it will be enabled again when the temperature-controlled brightness policy does not take effect.
- When the temperature-controlled brightness policy takes effect, the manual brightness policy is ineffective.

7 Maintenance

7.1 Device Maintenance

Allows users to update the device firmware.

Prerequisites

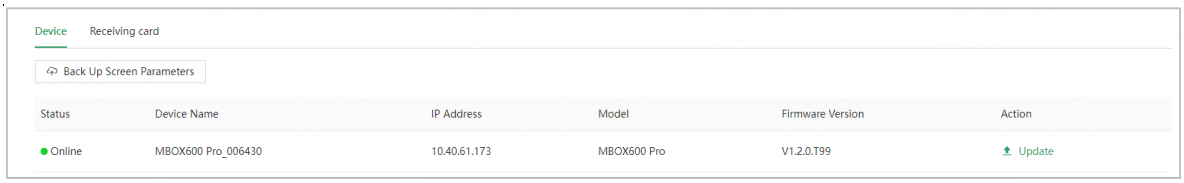
- Types of update file vary by operating system. The update file for Windows is “exe” and for Linux is “deb”. Using other types of file for update is not supported.
- The update file contains the MCU , FPGA, Xserver, update service and LCT Lite.

Step 1 From the navigation bar on the left, choose **Maintenance**.

Step 2 Select the **Device** tab.

Step 3 Click **Update**.

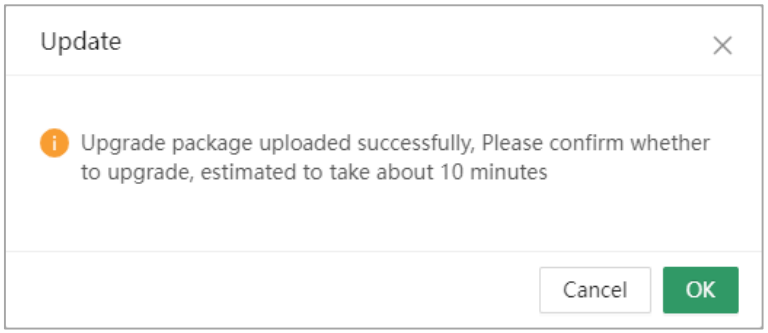
Figure 7-1 Device maintenance



Step 4 Select a firmware update file from the window that appears and click **Open**.

Step 5 After the update file is uploaded, click **OK** to start the update.

Figure 7-2 Confirm the update



Step 6 After the update is complete, the system will be automatically exit to the login page. Please enter your account and password to log in again.

Successful is displayed after the update is successful. If the update fails, a prompt will appear saying **Update failed. Do not power off or restart the device during the update process. For technical support, please contact NovaStar**.

Note:

- No other operations can be performed during the update process.
- Do not refresh the page during the update process, or it will display **This site can't be reached**. Refresh the page after the update completes to return to normal.

7.2 Receiving Card Maintenance

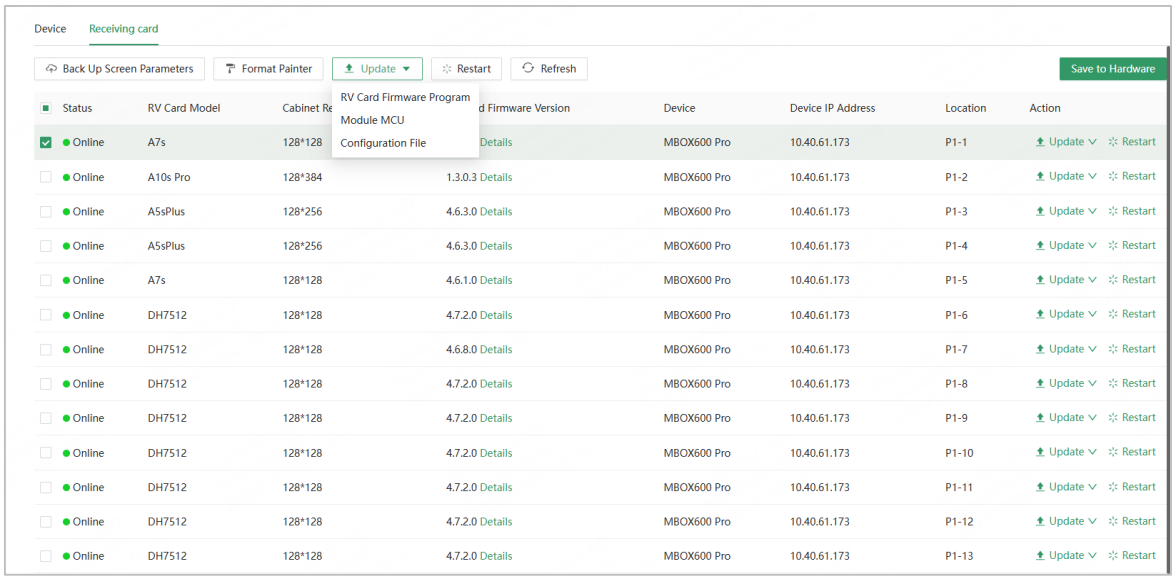
Allows users to update receiving card firmware, module MCU (smart modules only) and module configuration files.

Step 1 From the navigation bar on the left, choose **Maintenance**.

Step 2 Select the **Receiving card** tab.

Step 3 Select a cabinet, hover the mouse over **Update** and select an update type from the drop-down list that appears (RV card firmware program, module MCU and configuration file).

Figure 7-3 Cabinet maintenance



Step 4 Select an update file from the window that appears (the file type of the receiving card firmware program and module MCU is "zip" or "rar" and the configuration file type is "rcfgx"), and click **Open**.

Step 5 After the update file is uploaded, click **Update**.

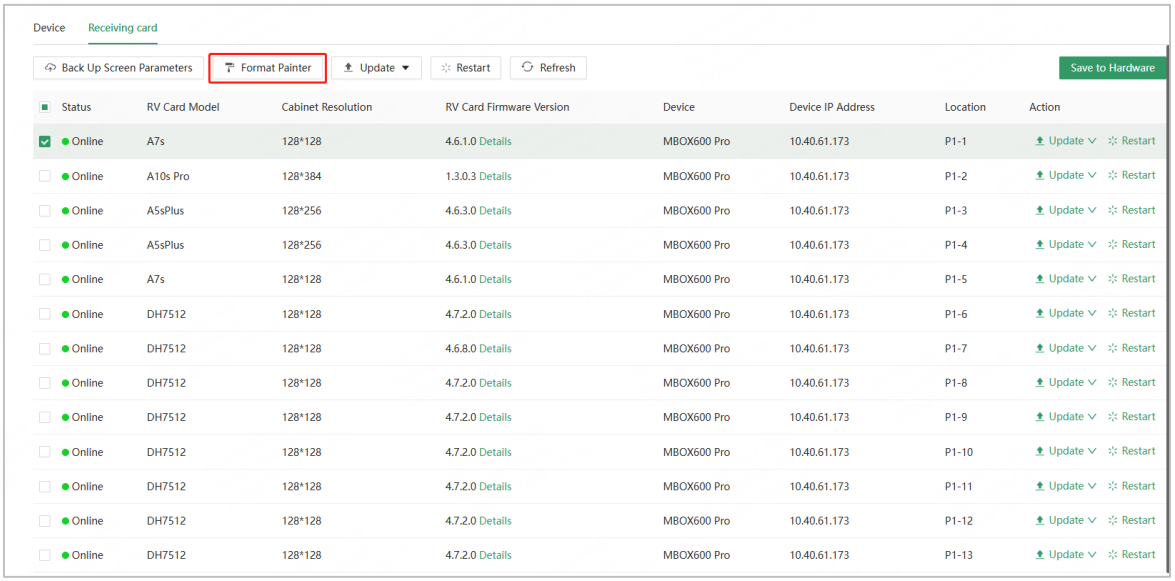
Step 6 **Successful** is displayed after the update is successful.

Step 7 Click **Save to Hardware** to save the update file to the hardware.

Step 8 (Optional) Update the receiving card configuration file with the format painter. (Update the configuration file only, not the firmware.)

1. Select a cabinet and click **Format Painter**.

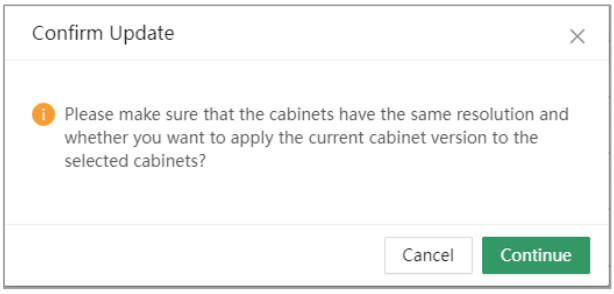
Figure 7-4 Format painter



2. After the configuration file read-back is done, select one or more cabinets and click **Start**.
3. Click **Continue**.

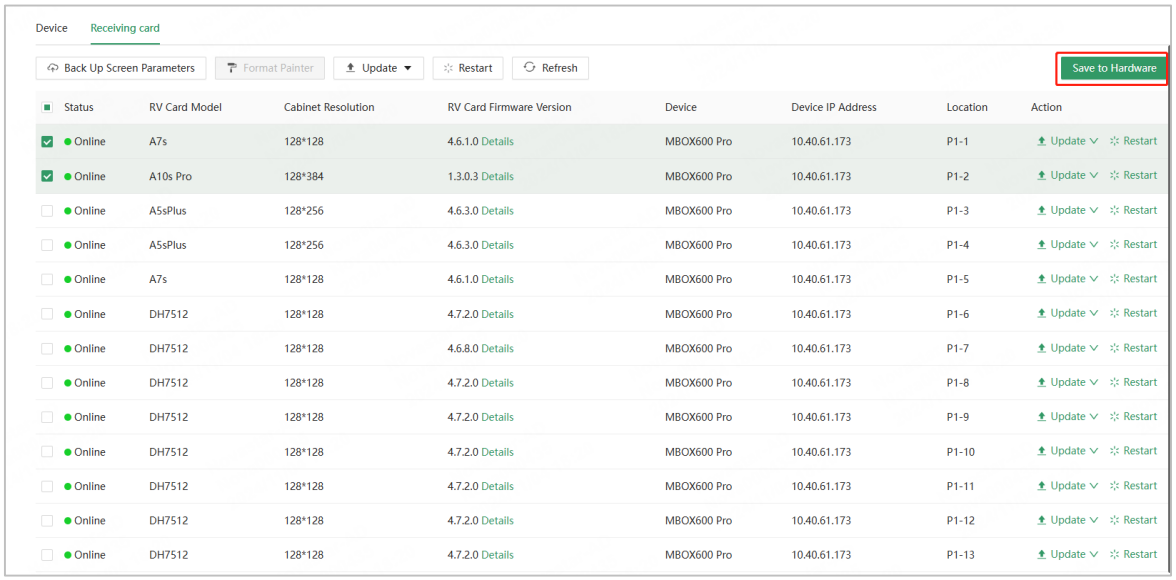
   Successful is displayed after the update is done.

Figure 7-5 Continue



4. Click **Cancel**.
5. Select the successfully updated cabinet(s) and click **Save o Hardware**.

Figure 7-6 Save to hardware



7.3 Screen Parameter Backup

Allows users to back up screen parameters to VNNOX Care cloud platform to bind, enabling the device and VNNOX Care cloud platform to be bound.

Step 1 From the navigation bar on the left, choose **Maintenance**.

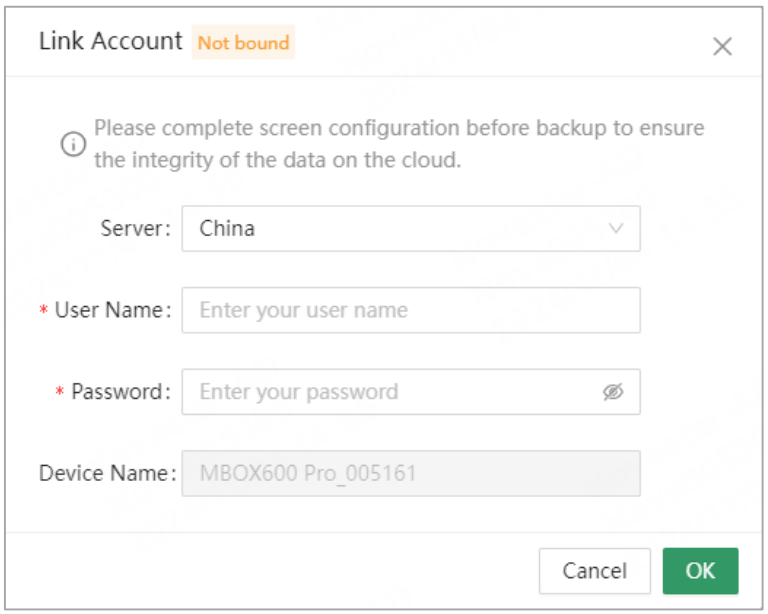
Step 2 Select the **Device** or **Receiving card** tab.

Step 3 Back up the screen parameters to VNNOX Care cloud platform.

- Not bound to VNNOX Care

1. Click **Back Up Screen Parameters**.
2. From the window that appears, Select a server node, enter a user name and password, and click **OK**.

Figure 7-7 Bind to VNNOX Care



3. After the binding is done, go to VNNOX Care cloud platform for online monitoring.

- Already bound to VNNOX Care

  Click **View** to go to VNNOX Care cloud platform to view the details or click **Edit** to edit the account information.

8 Toolbox

8.1 Import Configuration Files

Prerequisites

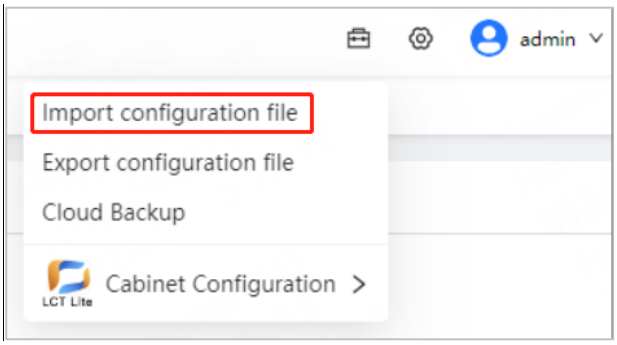
- The file extension is ".mprj".
- The file format and content meet the project file requirements.
- The data in the file cannot be changed or deleted.
- The device model in the file matches the actual device model.
- The current version of Web Interface Control cannot be earlier than the version in the file.

Operating Procedure

Step 1 Hover the mouse over in the navigation bar at the top.

Step 2 From the drop-down menu, choose **Import Configuration File**.

Figure 8-1 Import configuration file

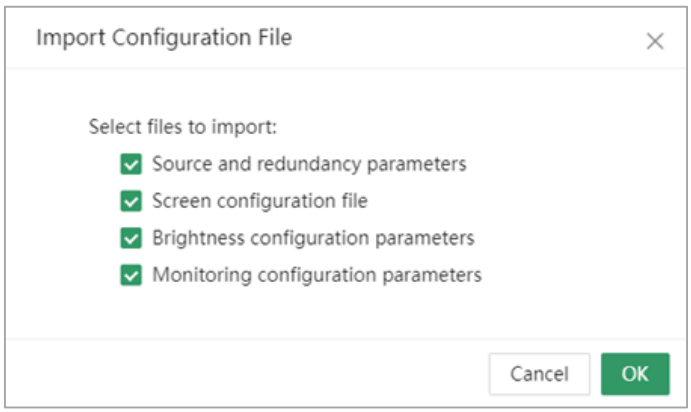


Step 3 Select the configuration file from the local folder, and click **Open**.

Step 4 Select files to import.

The system parses the configuration file to identify importable files. Parameter types that do not exist in the configuration file are displayed in gray and cannot be selected.

Figure 8-2 Select file range



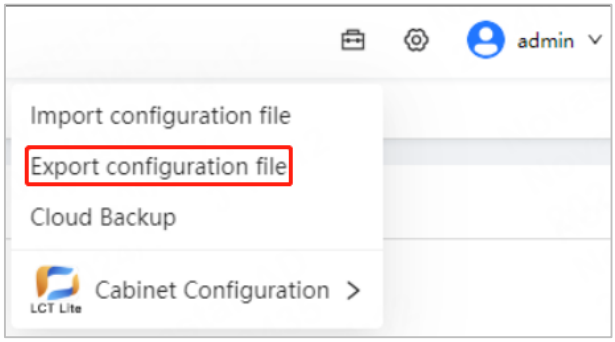
Step 5 Click **OK** to import the configuration file to the device.

8.2 Export Configuration Files

Step 1 Hover the mouse over in the navigation bar at the top.

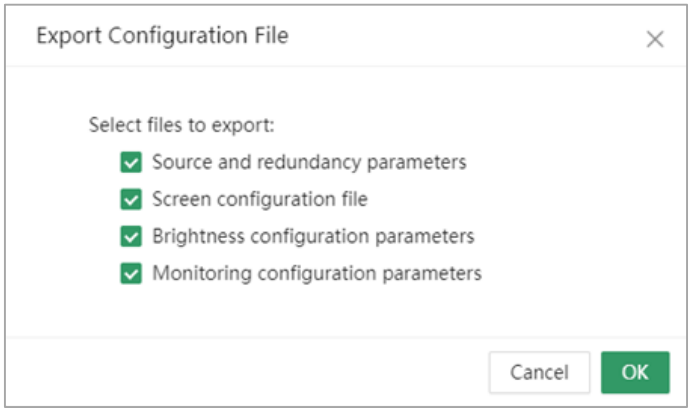
Step 2 From the drop-down menu, choose **Export Configuration File**.

Figure 8-3 Export configuration file



Step 3 Select files to export.

Figure 8-4 Selecting files to export



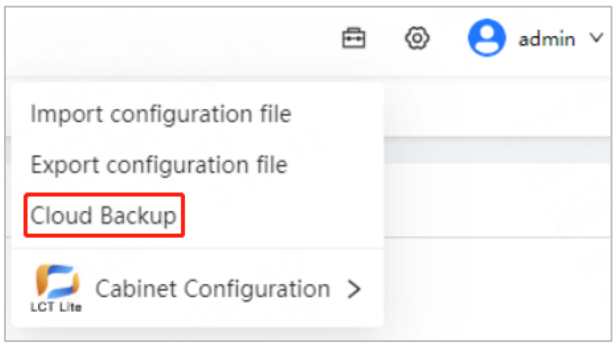
Step 4 Click **OK** to export the configuration file.

8.3 Cloud Backup

Step 1 Hover the mouse over in the navigation bar at the top.

Step 2 From the drop-down menu, choose **Cloud Backup**.

Figure 8-5 Cloud backup



Step 3 After the backup is done, data such as source parameters, screen configuration files, brightness configuration parameters, and monitoring configuration parameters will be backed up to VNNOX Care cloud platform.

8.4 Cabinet Configuration

Prerequisites

When users launch NovaLCT Lite for the first time, a **Windows Security Alert** dialog box appears. To use the software normally, tick the checkbox and click **Allow access**.

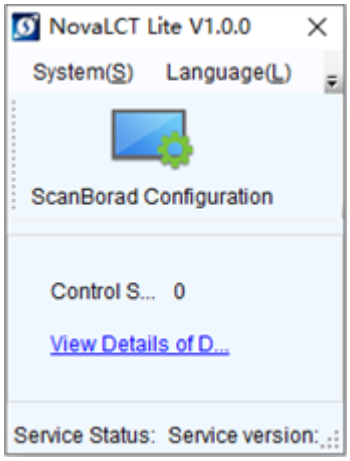
During smart settings with NovaLCT Lite: If the PC running NovaLCT Lite is an external PC, use the HDMI source as the input source; if the PC running NovaLCT Lite is the MBOX600 Pro, then use the internal source of the MBOX600 Pro as the input source to observe the display of modules in real-time.

When configuring screen parameters, users are advised to use NovaLCT Lite. After the screen parameter configuration is done in NovaLCT Lite, if users want to adjust the parameters using the web application, power cycle the screen before proceeding with the web application for configuration. To use NovaLCT Lite to configure parameters again, restart the receiving card after completing the configuration, otherwise, the parameters will not take effect.

Related Information

Access the cabinet configuration tool in the toolbox. Follow the on-screen instructions to open the cabinet configuration tool and use the complete receiving card configuration features. For details, see the user manual of NovaLCT.

Figure 8-6 Cabinet configuration



9 Settings

For the detailed description of settings, see Table 9-1.

Table 9-1 Settings

Settings	Description
Language	Switch the display language. Chinese and English are supported for now.
Log	For more details, see Log.
About	Display the version, copyright information and official website address.

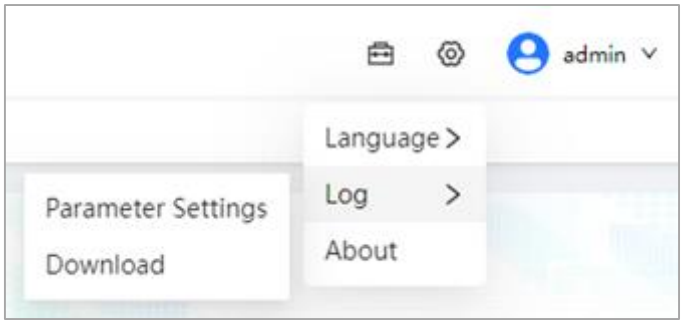
Log

Allows users to set log parameters and download logs.

Step 1 Hover the mouse over in the upper navigation bar.

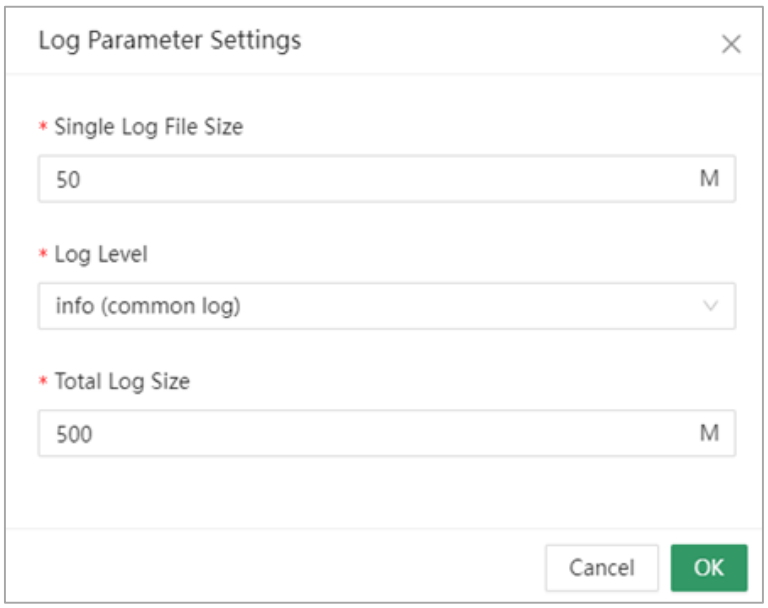
Step 2 In the settings menu bar, choose **Log** > **Parameter Settings**.

Figure 9-2 Parameter Settings



Step 3 Set **Single Log File Size**, **Log Level** (common log and debug log), and **Total Log Size** (**Single Log File Size** must be greater than or equal to **Total Log Size**), and click **OK**.

Figure 9-3 Log parameter settings



Step 4 In the settings menu bar, choose **Log** > **Download** to download the required log.

10 SNMP

The MBOX600 Pro supports the SNMP protocol. For details, please see the user guide of the SNMP protocol.

Trademark

NOVASTAR is a trademark of Xi'an NovaStar Tech Co., Ltd.

Statement

Thank you for choosing NovaStar's product. This document is intended to help you understand and use the product. For accuracy and reliability, NovaStar may make improvements and/or changes to this document at any time and without notice. If you experience any problems in use or have any suggestions, please contact us via the contact information given in this document. We will do our best to solve any issues, as well as evaluate and implement any suggestions.

Official website
www.novastar.tech

Technical support
support@novastar.tech