SP60 Pro

LED Display Controller

User Manual

Change History

Document Version	Release Date	Description
V1.2.0	2024-10-24	• Added features including dynamic Booster, image quality enhancement, and presets. • Added support for Delta3 and Delta4 sub-pixel layouts. • Supports mixed output via optical port and Ethernet, as well as SPDIF audio output.
V1.0.0	2023-07-27	First release

Contents

1 Introduction

The SP60 Pro is an LED display controller developed by Xi'an NovaStar Tech Co., Ltd. (referred to as NovaStar). It is specifically designed for sub-pixel (virtual pixel) screens and boasts 20 Ethernet ports. This controller combines video processing and control functions and features 2x HDMI 2.0 input ports, 20x Ethernet output ports, and 2x 10G optical ports. It can also work with the brand-new software VMP (Vision Management Platform) to provide a better operation and control experience.

This document primarily outlines the menu operations on the LCD screen of the controller and the operations related to dynamic sub-pixels in VMP. For more function operations, see the *VMP Vision Management Platform User Manual*.
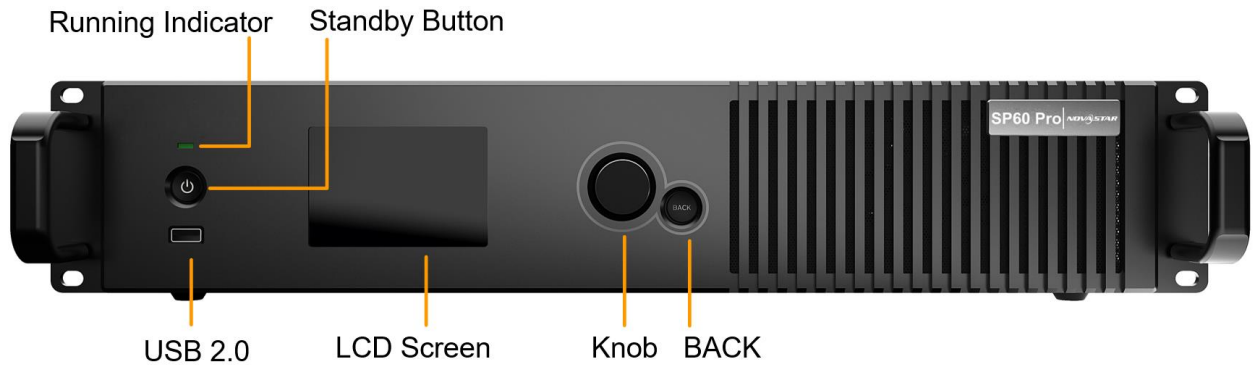
Note

The SP60 Pro controller needs to be used with a receiving card that supports dynamic sub-pixel rendering solutions. Currently supported cards include A8s Pro, A10s Pro, MRV532, NV3210, BR624L, and NS6323A.

2 Appearance

2.1 Front Panel

Name	Description
Running indicator	• Solid red: Standby • Solid blue: The device is being powered on. • Solid green: The device is running normally. • Flashing red: The device is running abnormally.
Standby button	• Press the button to power on or power off the device. • Hold down the button for 5s to 10s to restart the device.
USB 2.0	• Connect to a USB drive only to export the device diagnostic result. • Only the NTFS and FAT32 file systems are supported. Others are not supported.
LCD screen	A 3.5-inch screen that displays the device status, menus, submenus and messages for parameter settings
Knob	• On the home screen, press the knob to enter the main menu screen. • On the main menu screen, rotate the knob to select a menu item or adjust the parameter value. Press the knob to confirm the operation. • Hold down the knob and BACK button simultaneously for 5s or longer to lock or unlock the buttons.
BACK	Go back to the previous menu or cancel the current operation.

2.2 Rear Panel
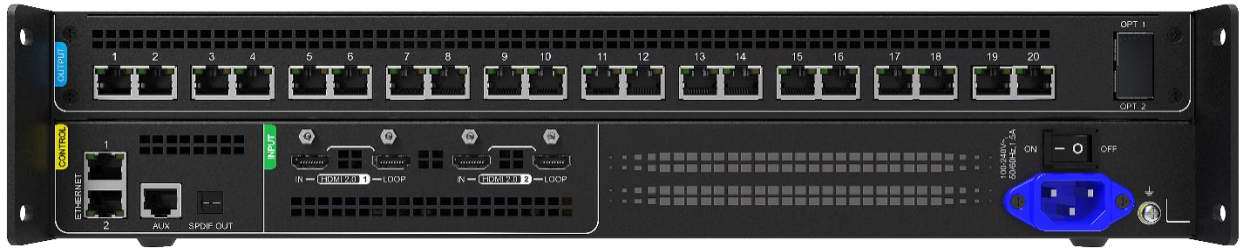
Inputs (INPUT area)		
Type	Qty	Description
HDMI 2.0-1 IN & HDMI 2.0-2 IN	2	**Resolution** Max resolution: 4096×2160@60Hz or 8192×1080@60Hz (Forced) Min resolution: 800×600@60Hz
		Max width/height (Forced) Max width: 8192 pixels (8192×1080@60Hz) Max height: 7680 pixels (1080×7680@60Hz)
		Frame rates 50 / 59.94 / 60 / 71.93 / 72 / 75 / 100 / 119.88 / 120 / 143.86 / 144 / 240 Hz
		HDR Support HDR10 and comply with the SMPTE ST 2084 and SMPTE ST 2086 standards. Support HLG.
		EDID management Support standard resolutions, up to 3840×2160@60Hz. Support custom input resolutions.
		HDCP Support HDCP 2.2, backwards compatible with HDCP1.4 / 1.3.
		Interlaced signal inputs No support
Outputs (OUTPUT area)		
Type	Qty	Description

1–20	20	Gigabit Ethernet output ports. Support hot backup between Ethernet ports.
		
		• The maximum sub-pixel load capacity of the device is 17.69 million.
		• For Delta1 sub-pixel layout, the maximum sub-pixel load capacity of a single port is:
		  − 8bit@60Hz: 1.3 million pixels.
		  − 10bit@60Hz: 0.975 million pixels.
		  − 8bit@120Hz: 0.65 million pixels.
		• For RGGB sub-pixel layout, the maximum sub-pixel load capacity of a single port is:
		  − 8bit@60Hz: 1.95 million pixels.
		  − 10bit@60Hz: 1.56 million pixels.
		  − 8bit@120Hz: 0.975 million pixels.
		• For Delta3 sub-pixel layout, the maximum sub-pixel load capacity of a single port is:
		  − 8bit@60Hz: 1.95 million pixels.
		  − 10bit@60Hz: 1.4625 million pixels.
		  − 8bit@120Hz: 0.65 million pixels.
		• For Delta1 sub-pixel layout, the maximum sub-pixel load capacity of a single port is:
		  − 8bit@60Hz: 2.6 million pixels.
		  − 10bit@60Hz: 1.95 million pixels.
		  − 8bit@120Hz: 1.3 million pixels.
		📄Note:
		  − Please note that when calculating the load capacity, do not exceed the total load capacity of the device.

OPT 1–2	2	10G optical output ports • OPT 1 outputs the data on Ethernet ports 1 to 10. • OPT 2 outputs the data on Ethernet ports 11 to 20. • Supports mixed output through both optical and Ethernet ports. Ethernet ports associated with different numbered optical ports support selective output. When both are connected, the priority is: Optical ports > Ethernet ports.
HDMI 2.0 LOOP	2	An HDMI loop output connector
SPDIF OUT	1	A digital audio output port that allows you to choose and output audio from one of two HDMI input sources.
Controls (CONTROL area)		
Type	Qty	Description

ETHERNET	2	Gigabit Ethernet control ports. Support TCP/IP protocol and star connection. They have the same functions without priority and order, and can be connected to VMP software. No switch or router is needed to deploy multiple devices on the same LAN via device cascading as the network switching function is already built in. Up to 20 SP60 Pro can be cascaded.
AUX	1	An auxiliary connector that connects to the central control device (RS232) (Reserved)
Power		
100–240V~, 50/60Hz, 1.5A	1	An AC power input connector and switch

3 Applications

The SP60 Pro has two typical application scenarios as shown below. In those application examples, the LED screen size is 4096×2160.

Application 1: Output via Ethernet Ports
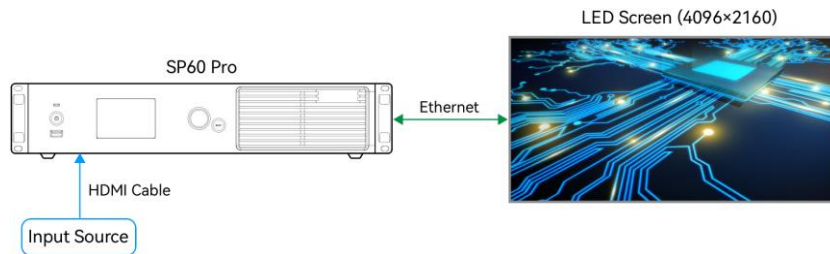
Application 2: Long-Distance Transmission via OPT Ports

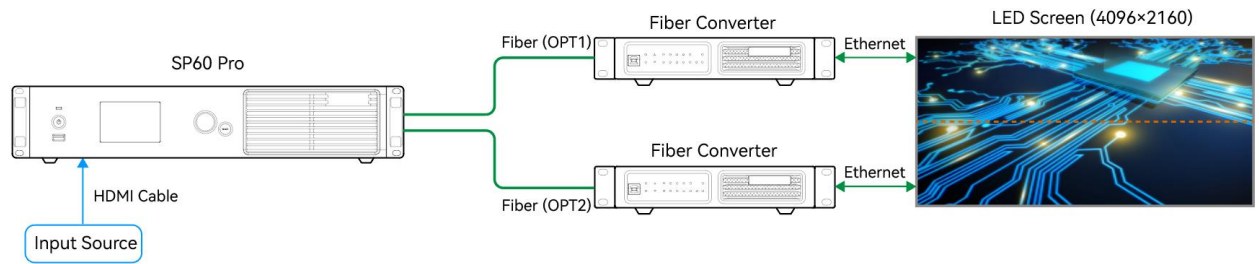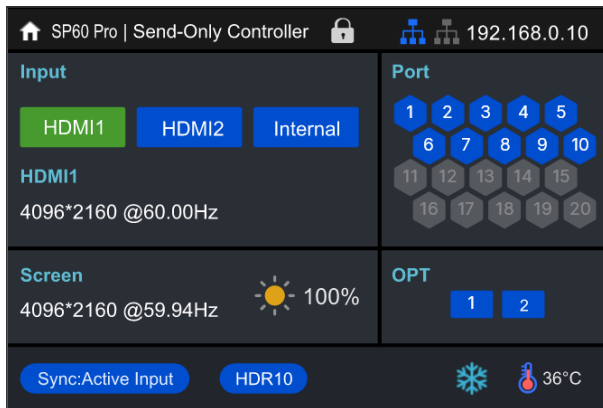# 4 UI Introduction

4.1 Home screen

After the device is powered on, the home screen showing device related information is displayed.

Figure 4-1 Home screen

The home screen is shown in Figure 4-1 and the home screen descriptions are shown in Table 4-1.

Table 4-1 Home screen descriptions

Item	Content	Description
Top line	SP60 Pro	The device name The name can be changed in VMP software.
	Send-Only Controller	The device working mode • All-In-One Controller: The video processing and sending functions are available. • Send-Only Controller: Only the video sending function is available. Please refer to 7.1 Switch Working Mode for related operations.
	🔒	The device button lock status • When the icon displayed: The buttons are locked. • When the icon not displayed: The buttons are unlocked. Hold down the knob and **BACK** button simultaneously for 5s or longer to lock or unlock the buttons.
	🖧	The connection status of the Ethernet ports • Blue: Connected

Item	Content	Description
		• Gray: Disconnected
	192.168.0.10	The device IP address Please refer to 7.2 Configure Communication Settings for related operations.
Input	HDMI1, HDMI2, Internal	The device input source type and status • Green: The signal is accessed normally and used. • Blue: The signal is accessed normally, but not used. • Red: The signal is abnormal. • Gray: The signal is abnormal and not used. Please refer to 5.1.1 Set Input Source for related operations in the Send-Only Controller working mode.
	HDMI1 4096*2160@60.00Hz	The resolution and frame rate of the currently available input source If multiple input sources are available, the resolution and frame rate of each input source will be displayed one by one. If the input is used by the layer, the layer number will be displayed below. Please refer to 6.2.2 Set Resolution and Frame Rate for related operations.
Screen	4096*2160@59.94Hz	The screen resolution and frame rate
	☀	The screen brightness Please refer to 6.5.1 Adjust Screen Brightness for related operations.
Port	1–20	The statuses of the Ethernet ports • Blue: Connected • Gray: Disconnected
OPT	1–2	The statuses of the OPT ports • Blue: Connected • Gray: Disconnected
Bottom line	Sync:Active Input	The sync signal currently used and the signal status • Sync: Active Input: Sync with the frame rate of the current input source. • Sync: Internal: Sync with the frame rate of the internal clock of the device. Color code: • Blue: The signal is normal. • Red: The signal is abnormal.
	HDR10	HDR format

Item	Content	Description
		Please refer to 6.2.4 Set HDR Parameters for related operations.
	3D	The 3D function status • The icon displayed: The 3D function is turned on. • The icon not displayed: The 3D function is turned off. For related operations, please refer to 6.5.3 Enable 3D Function.
	❄	The output image status • ❄: The output image is frozen. • ⌀ : The output image is blacked out. • If no icon is displayed, the output image is normal. Please refer to 7.4 Control Display Status for related operations.
	🌡	The temperature inside the chassis

4.2 Main Menu

On the home screen, press the knob to enter the main menu screen. When the device working mode is All-In-One Controller, the main menu is shown in Figure 4-2. When the device working mode is Send-Only Controller, the **Layer Settings** menu is not displayed.

Figure 4-2 Main menu
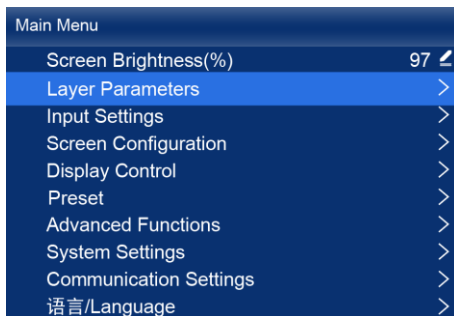
5 **Initial Screen Configuration**

If the LED screen, cabinets, data flow and the number of cabinets loaded by Ethernet ports can meet the following requirements, you can configure the screen via the device front panel menu; otherwise, screen configuration in VMP will be your ideal choice.

- Screen: The LED screen must be a regular screen.

- Cabinet: The cabinets must be regular ones of the same size, and function well.

- Data flow: The data must run in the same way for all Ethernet ports and the data flow must be one of the followings. The starting position of the data flow is the first cabinet of Ethernet port 1, and the connections are made in sequence according to the serial number of the Ethernet port.

- Number of cabinets loaded by Ethernet ports: If *n* ports are used to load the cabinets, the number of cabinets loaded by each of the first (*n*−*1*) ports must be the same and the integral multiple of the number of cabinet rows or columns, and it must be greater than or equal to the number of cabinets loaded by the last port.

5.1 Quick Screen Configuration via Front Panel Screen

5.1.1 Set Input Source

Select the desired input source and complete the related settings, such as resolution and frame rate. If the resolutions of the input source and screen are the same, the image can be displayed pixel to pixel. A lower frame rate may result in image flickering, while a higher frame rate helps stabilize the display image.

> **Note**
>
> Input source settings are required for screen configuration in the Send-Only Controller working mode and not required in the All-In-One Controller mode.

Step 1   On the main menu screen, choose **Input Settings** > **Select Input** to select a video source.

Figure 5-1 Select input source
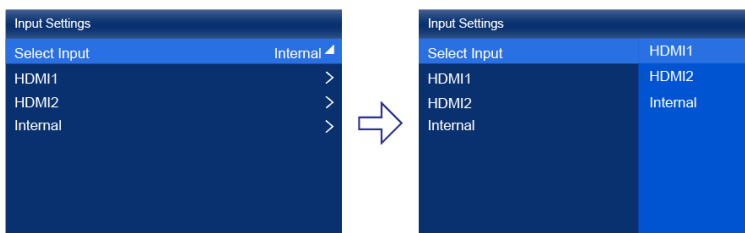
When the device working mode is All-In-One Controller, the **Select Input** menu is not displayed.

Step 2 Perform the corresponding operations for the input source according to the input source type.

- External input sources (HDMI1, HDMI2)

a. Choose *input source* > **EDID**. The *input source* is HDMI1 or HDMI2.

b. Set **Mode** to **Custom** or **Standard**, and then set the resolution and frame rate.

Custom: Set the resolution manually.

Standard: Select the desired resolution from the listed ones.

c. After the settings are done, click **Apply**.

- Internal sources
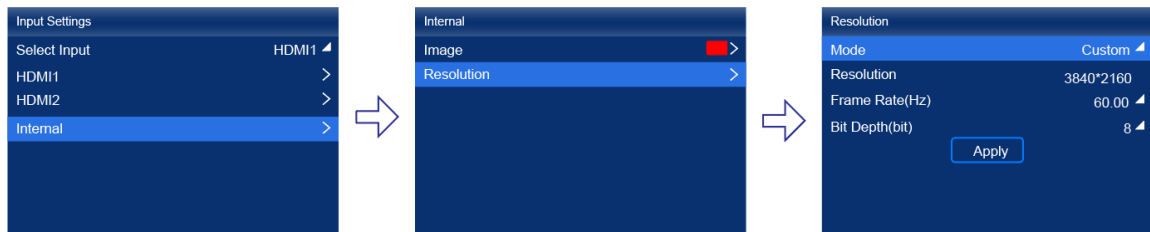
a. Choose **Internal Source** > **Image**, and then select a static picture or a motion picture.
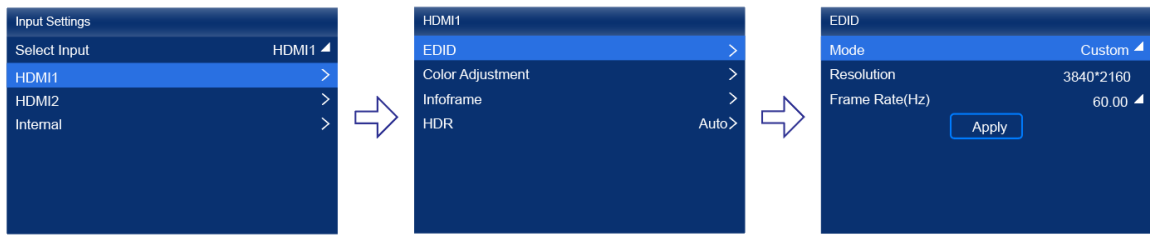
b. When the relevant parameters of the image are displayed, set the parameters according to your actual needs; otherwise, please skip this step.

c. Press the **BACK** button to go back to the upper level menu and select **Resolution**.

d. Set **Mode** to **Custom** or **Standard**, and then set the resolution, frame rate and bit depth.

e. After the settings are done, click **Apply**.

5.1.2 Load Cabinet Config Files

When the cabinet cannot display images normally, send the cabinet configuration file (.rcfgx) to the cabinet and save it to let the cabinet display image normally. Before the operation, please import cabinet configuration file with VMP.

Step 1 On the main menu screen, choose **Screen Configuration** > **Send Cabinet Config File**.

Figure 5-2 Send cabinet config file

Step 2   Select the target configuration file.

Step 3   Select **Yes** in the displayed dialog box.

After the configuration file is successfully sent, a message appears on the menu screen and then you will automatically return to configuration file screen.

Step 4   Press the **BACK** button to go back to the upper level menu.

Step 5   Select **Save to RV Card**.

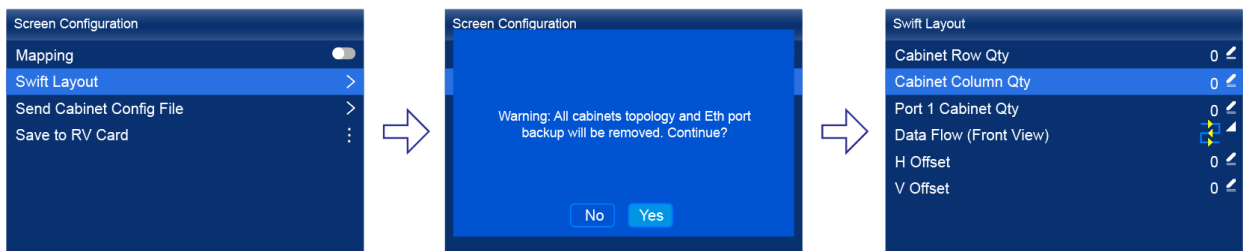Step 6   Select **Yes** in the displayed dialog box.

After the configuration file is successfully saved, a message appears on the menu screen.

5.1.3 Configure the Screen Quickly

Set the screen configuration parameters to quickly complete the cabinet connection, so that the LED screen can display the input source image normally.

Step 1   On the main menu screen, choose **Screen Configuration** > **Swift Layout**.

Figure 5-3 Swift layout

Step 2   Select **Yes** in the displayed dialog box.

Step 3   Set the following swift layout parameters as required.

- Cabinet Row Qty: Set the quantity of cabinet rows.
- Cabinet Column Qty: Set the quantity of cabinet columns.
- Port 1 Cabinet Qty: Set the quantity of the cabinets loaded by Ethernet port 1.
- Data Flow (Front View): Select the data flow for the cabinets loaded by Ethernet port 1.
- H Offset: Set the horizontal offset of the displayed image.
- V Offset: Set the vertical offset of the displayed image.

5.2 Free Screen Configuration via VMP

The VMP software can be used to configure either the regular screens or complex screens, and supports free wiring of the cabinets, plus the ability of calculating the used load capacity according to the cabinets that are actually loaded. For the details of performing the free screen configuration, please refer to *VMP Vision Management Platform User Manual*.

6 Display Effect Adjustment

6.1 Apply Presets

Apply a saved preset in VMP to the device to quickly complete display effect adjustment.

Step 1   On the main menu screen, select **Preset**.

The saved presets in VMP is displayed on the menu screen, as shown in Figure 6-1.

Figure 6-1 Presets
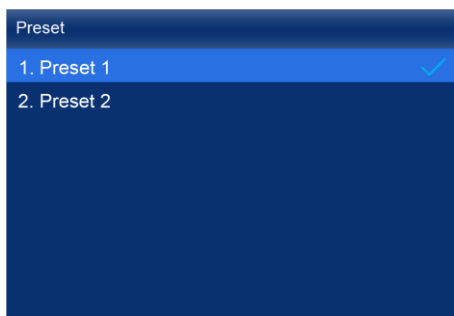
Step 2   Select a preset.

6.2 Set External Input Source Parameters

6.2.1 View Input Source Information

View the attribute values of the external input source, including the resolution, frame rate, bit depth, color gamut, etc.

Step 1   On the main menu screen, choose **Input Settings** > *input source* > **Infoframe**. The *input source* is HDMI1 or HDMI2.

Figure 6-2 Input source information

When the device working mode is All-In-One Controller, the **Select Input** menu is not displayed.

Step 2   View the input source information.

6.2.2 Set Resolution and Frame Rate

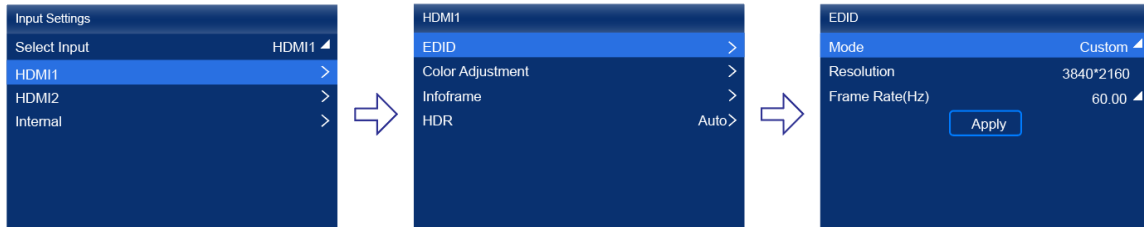Set the resolution and frame rate of the external input source. If the resolutions of the input source and screen are the same, the image can be displayed pixel to pixel. A lower frame rate may result in image flickering at low refresh rate, while a higher frame rate helps stabilize the display image.

Step 1 On the main menu screen, choose **Input Settings** > *input source* > **EDID**. The *input source* is HDMI1 or HDMI2.

Figure 6-3 EDID

When the device working mode is All-In-One Controller, the **Select Input** menu is not displayed.

Step 2 Set **Mode** to **Custom** or **Standard**, and then set the resolution and frame rate.
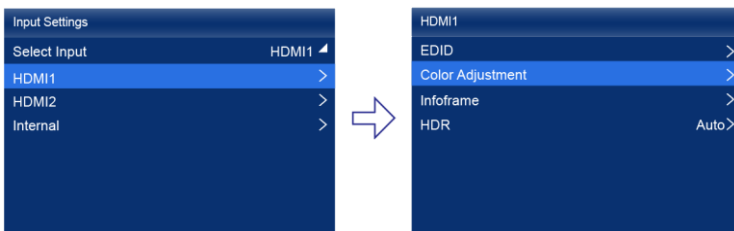
- Custom: Set the resolution manually.

- Standard: Select the desired resolution from the listed ones.

Step 3 After the settings are done, click **Apply**.

6.2.3 Adjust Color

Set the image brightness and contrast.

Step 1 On the main menu screen, choose **Input Settings** > *input source* > **Color Adjustment**.

When the device working mode is All-In-One Controller, the **Select Input** menu is not displayed.

Step 2 Set the related parameters.

| Parameter	Description
Black Level	It is used to adjust the brightness of the dark areas of the image. The smaller the value, the darker the dark part of the screen.
Contrast	It is used to adjust the brightness of the highlight areas of the image. The greater the value, the brighter the highlight part of the screen. Contrast and black level together affect the overall contrast of the image.

Saturation	It is used to adjust the color purity of the image. The greater the value, the more vivid the color.
Hue	It is used to adjust the color effect of the displayed image color.
Red Shadow/Green Shadow/Blue Shadow	It is used to adjust the brightness of the dark areas of the image. The principle is the same as that of black level, but the RGB components are adjusted.
Red Highlight/Green Highlight/Blue Highlight	It is used to adjust the brightness of the highlight areas of the image. The principle is the same as that of contrast, but the RGB components are adjusted.

6.2.4 Set HDR Parameters

Set the parameters used during the process of parsing HDR video sources.

Step 1   On the main menu screen, choose **Input Settings** > *input source* > **HDR**. The *input source* is HDMI1 or HDMI2.

Figure 6-4 HDR
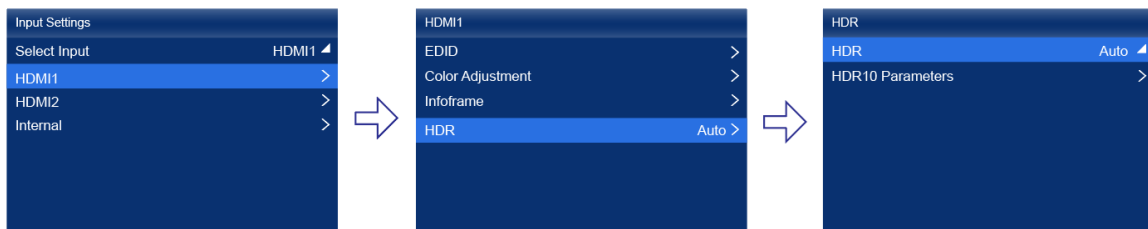
When the device working mode is All-In-One Controller, the **Select Input** menu is not displayed.

Step 2   Select **HDR** and select the HDR format from the listed options.

Select **Auto** and the device will read the attribute value that comes with the input source.

Step 3   Select **HDR10 Parameters** to complete the related settings. If the HDR format is HLG here, no parameters need to be set.

HDR10-related parameters include:

- PQ mode: The mapping method of video source brightness.
    - ST2084 (PQ): This mode 1:1 maps the brightness of the video source. The part that exceeds the maximum screen brightness will still be adjusted to the maximum screen brightness.
    - ST2086 (Linear mapping): This mode linearly maps the brightness of the video source. It globally adjusts the video source brightness according to the maximum screen brightness to ensure that the ratio of the brightness of the entire source content remains unchanged.
- MaxCLL Override: When the **MaxCLL Override** switch is ⬤, the **MaxCLL** parameter takes effect.
- MaxCLL: Override the maximum video source brightness and adjust the brightness to a specified value.
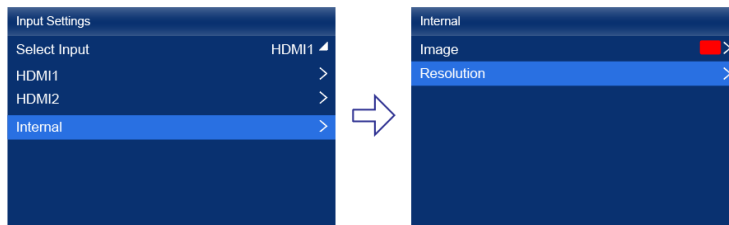
To restore the parameters to the defaults, select **Reset**.

6.3 Set Internal Input Sources

Select the internal source stored in the device and set the related parameters for screen testing and troubleshooting.

Step 1 On the main menu screen, choose **Input Settings** > **Internal** > **Image**.

Figure 6-5 Internal sources

When the device working mode is All-In-One Controller, the **Select Input** menu is not displayed.

Step 2 Select a static picture or a motion picture.

Step 3 When the relevant parameters of the image are displayed, set the parameters according to your actual needs; otherwise, please skip this step.

Step 4 Press the **BACK** button to go back to the upper level menu and select **Resolution**.

Step 5 Set **Mode** to **Custom** or **Standard**, and then set the resolution, frame rate and bit depth.

Figure 6-6 Resolution parameters
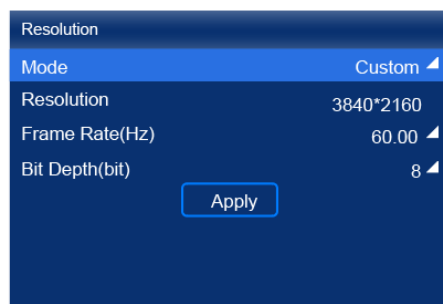
- Custom: Set the resolution manually.
- Standard: Select the desired resolution from the listed ones.

Step 6 After the settings are done, click **Apply**.

6.4 View Layers Parameters (All-In-One Controller Mode only)

The LCD screen of the controller is designed to only display layer parameters. To create or configure layers, please connect to VMP for these operations. For detailed instructions, please refer to *VMP Vision Management Platform User Manual*.

Step 1 On the main menu screen, select **Layer Parameters**.

Figure 6-7 Layer parameters

Step 2 View the **Canvas Size** and the max frame rate.

Step 3 Select a layer and view the related parameters.

- Input Source: The number of the layer that is using this input source is displayed in the input source information area.

- Scaling Mode: The scaling mode currently being applied.

  - Custom: Customized width and height.

  - Pixel to Pixel: Same as the width and height of the input source

  - Snap to Canvas: Same as the width and height of the canvas

  - Fill Screen: Same as the width and height of the screen

- Width: The layer width.

- Height: The layer height.

- H Position: The horizontal coordinate (X) of the layer on the canvas.

- V Position: The vertical coordinate (Y) of the layer on the canvas.

- Priority: The Z coordinate of the layer on the canvas. The greater the value, the higher priority.

- Crop: The status of the input crop, as well as the size and position of the crop.

- Border: The status of the layer border, as well as the border thickness and color.

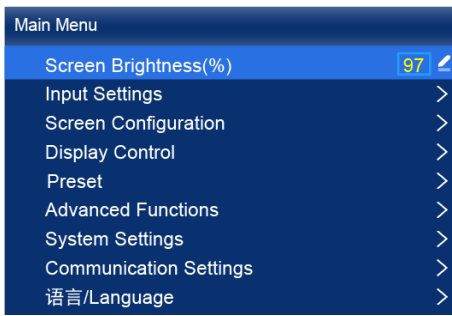Step 4 If necessary, select other layers and view the related parameters.

6.5 Set Output Parameters

6.5.1 Adjust Screen Brightness

Adjust and save the screen brightness.

Step 1 On the main menu screen, select **Screen Brightness** and press the knob to let the brightness value become editable.
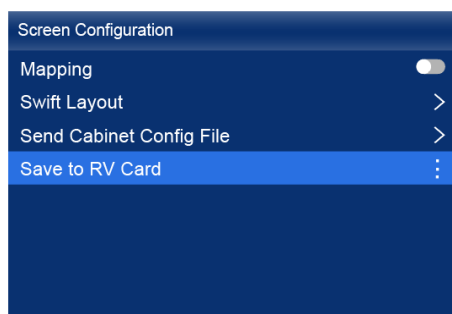
Figure 6-8 Screen brightness (Send-Only Controller mode as example)

Step 2   Rotate the knob to adjust the brightness to the target value, and then press the knob to confirm.

Step 3   Choose **Screen Configuration** > **Save to RV Card**.

Figure 6-9 Save to RV card

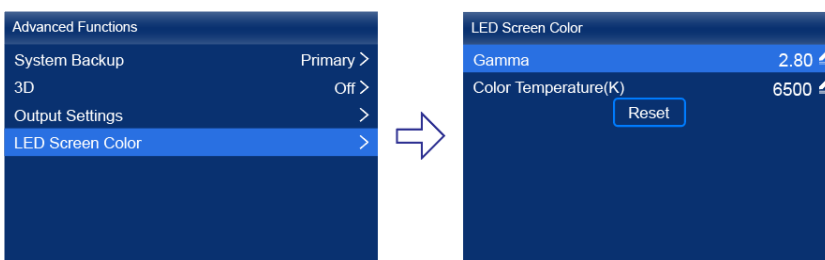Step 4   Select **Yes** in the displayed dialog box.

After the values are successfully saved, a message appears on the menu screen.

6.5.2 Adjust Gamma and Color Temperature

Adjust and save the Gamma and color temperature.

Step 1   On the main menu screen, choose **Advanced Functions** > **LED Screen Color**.

Figure 6-10 LED Screen Color

Step 2   Adjust the Gamma value.

1. Select **Gamma** and press the knob to let the value become editable.

2. Rotate the knob to adjust Gamma to the target value, and then press the knob to confirm.

Step 3   Adjust the color temperature value.

1. Select **Color Temperature** and press the knob to let the value become editable.

2. Rotate the knob to adjust the temperature to the target value, and then press the knob to confirm.

To restore the parameters to the defaults, select **Reset**.

Step 4   Press the **BACK** button to go back to the main menu, and then choose **Screen Configuration** > **Save to RV Card**.

Figure 6-11 Save to RV card
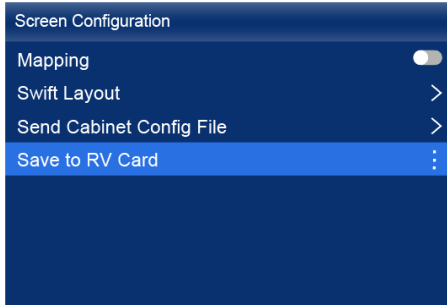
Step 5   Select **Yes** in the displayed dialog box.
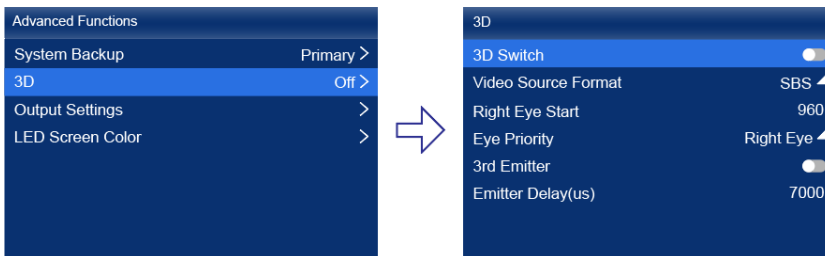
After the values are successfully saved, a message appears on the menu screen.

6.5.3 Enable 3D Function

Turn on the 3D function and set the related parameters.

Step 1   On the main menu screen, choose **Advanced Functions** > **3D**.

Figure 6-12 3D

Step 2   Turn on the 3D function by setting the 3D switch to ⬤.

Step 3   Set the related parameters.

- **Video Source Format**: Set the format of the 3D video source. Set the format to **SBS**, **TAB** or **Frame SEQ** according to the format of the accessed video source.

- **Right Eye Start**: Set the start position of the right eye image. When the video source format is SBS or TAB, and the left and right eye images are provided, this parameter can be set.

- **Eye Priority**: Set which image is sent first, the right eye image or the left eye image. Wear the 3D glasses to watch the display. If the display is abnormal, set the parameter value to the other one. If the display is normal, the setting is done.

- **3rd Emitter**: When a third-party 3D signal emitter is used, set the switch to ⬤.

- **Emitter Delay**: Set the delay time of sending the synchronization signal from the 3D signal emitter to the 3D glasses. This setting ensures that the switching between left and right eye images of the 3D glasses is in

sync with the switching between the left and right eye images on the display. This parameter applies to both the NovaStar and third-party emitters.

Note

To use the 3D function, specified 3D glasses are needed. For details, please contact NovaStar technical support.

6.5.4 Set Low Latency

The low latency function is used to reduce the delay at the controller, or increase the latency when the device works with high-latency equipment.

Step 1   On the main menu screen, choose **Advanced Functions** > **Output Settings**.

Figure 6-13 Low latency
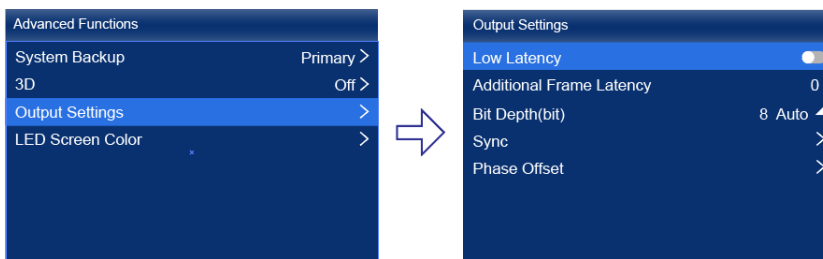

Step 2   Perform any of the following operations as required.

- Enable low latency

    Set the **Low Latency** switch to ⬤.

- Set additional frame latency

    a.   Select **Additional Frame Latency** and press the knob to let the value become editable.

    b.   Rotate the knob to adjust the parameter to the target value, and then press the knob to confirm.

Note

- The latency at the controller is 0 frame (less than 1 ms) in Send-Only Controller working mode and 1 frame in All-In-One Controller working mode.

- To enable low latency, please make sure all Ethernet ports load the cabinets vertically and share the same Y coordinate. Free screen configuration (for example, Ethernet port 2 loads cabinets horizontally, or its Y coordinate is different from that of Ethernet port 1) will reduce the load capacity.
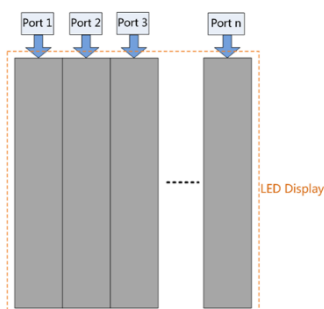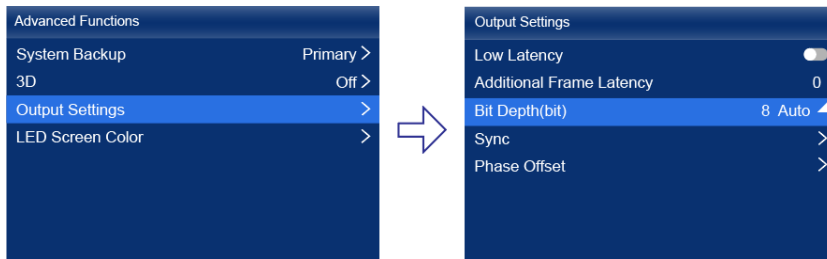
6.5.5 Set Output Bit Depth

Set the output bit depth of the input source.

Step 1   On the main menu screen, choose **Advanced Functions** > **Output Settings**.

Figure 6-14 Output bit depth

Step 2   Select the desired bit depth value from the listed ones.

If **Auto** is selected, the output bit depth is the same as the input bit depth.
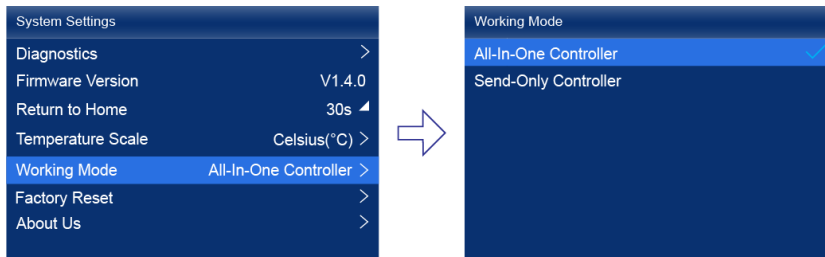
7 Device Management

7.1 Switch Working Mode

Set the device working mode to All-In-One Controller or Send-Only Controller.

Step 1　On the main menu screen, choose **System Settings** > **Working Mode**.

Figure 7-1 Working mode

Step 2　Select **All-In-One Controller** or **Send-Only Controller**.

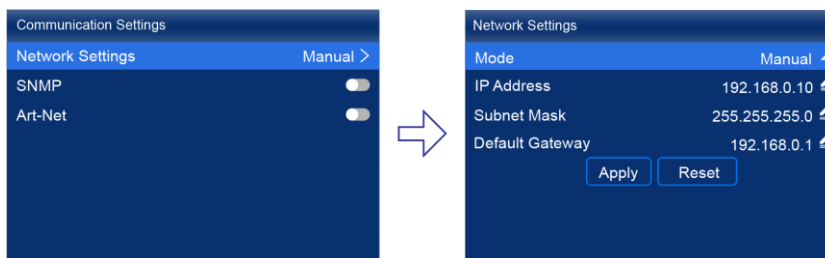Step 3　Select **Yes** in the displayed dialog box.

7.2 Configure Communication Settings

Set the IP Address

Manually set a static IP address for the device or set up the device to automatically obtain an IP address.

Step 1　On the main menu screen, choose **Communication Settings** > **Network Settings**.

Figure 7-2 Network settings

Step 2　Choose **Mode** and then select a mode from the drop-down options.

- Manual: Manually set a static IP address for the device.
- Auto: The device automatically obtains an IP address.

Step 3　If the manual mode is selected, set the **IP Address**, **Subnet Mask** and **Default Gateway** and select **Apply**. If the automatic mode is selected, this step is not required.

To reset the IP address to the default, select **Reset**.

Set the Protocol Switch

Set the SNMP and Art-Net protocol switch status.

📄**Note**

For details, see the *SNMP Protocol Instructions* and *Art-Net Protocol Instructions*.

7.3 Enable Mapping

After the Mapping function is enabled, cabinets can display some information, such as the Ethernet port number and receiving card number, allowing users to easily obtain the locations and connection topology of receiving cards.

Step 1　On the main menu screen, choose **Screen Configuration** > **Mapping**.

Figure 7-3 Mapping
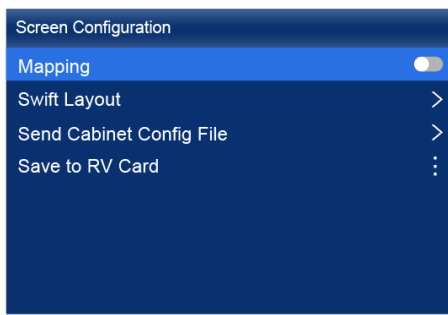
Step 2　Enable the Mapping function by toggling on this switch 🔵.

7.4 Control Display Status

Set the display loaded by the controller to a black screen or frozen status.

Step 1　On the main menu screen, choose **Display Control**.

Figure 7-4 Display control
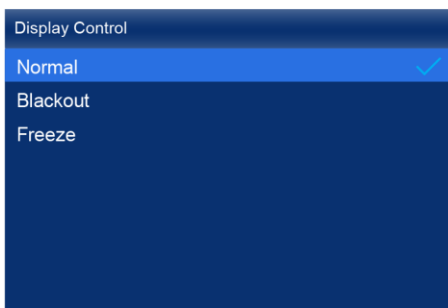
Step 2　Select a display status as required.

- Normal: Display the normal output screen.
- Freeze: Make the output screen always display the current frame. The input source is played normally.
- Blackout: Make the output screen go black. The input source is played normally.

7.5 Diagnostics

7.5.1 Upon Powering Up

When the device is powered on, it automatically conducts a diagnostic process:

- Normal startup: All functions of the SP60 Pro are available for use.

- Abnormal Startup: Based on the error message displayed, select **Export Log** to obtain the diagnostic results. If there are only warning messages (in orange), you can choose **Continue** to proceed in a limited functionality mode. However, if there are error messages (in red), usage cannot be continued.

7.5.2 Maintenance

Perform device diagnostics, then view and export the result.

Step 1   On the main menu screen, choose **System Settings** > **Diagnostics**.

Figure 7-5 Diagnostics
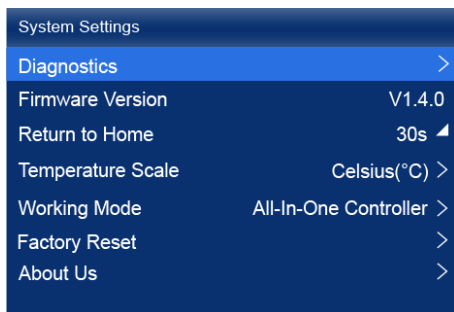
Step 2   Select **Yes** in the displayed dialog box.

After the diagnostics operation is complete, the diagnostic result will be displayed.

Step 3   Select **Close** to close the dialog box and the screen as shown in Figure 7-6 is displayed.

Figure 7-6 After diagnostics
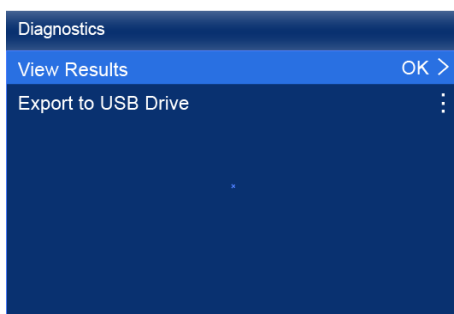
Step 4   Do any of the following as required.

- View the diagnostic results

  Select **View Results** to enter the report page and view the results.

- Export the diagnostic result to a USB drive

  a.   Insert the USB drive to the USB port on the front panel of the device.

   b.   Select Export to USB Drive.

        A prompt will be displayed after the operation is successful.

7.6 View Firmware Version

View the current firmware program version of the device.

Step 1 On the main menu screen, choose **System Settings**.

Step 2 View the current firmware program version next to **Firmware Version**.

Figure 7-7 Firmware version

7.7 Factory Reset

Reset part or all of the device data to the factory settings.

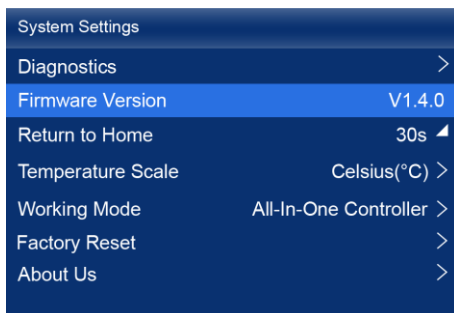Step 1 On the main menu screen, choose **System Settings** > **Factory Reset**.

Figure 7-8 Factory reset

Step 2 Do any of the following according to the data you want to reset.

•   Reset part of the data

     Reset all the data except the imported files, network parameters, language settings, and device name.

     a.   Select Keep User Data.

     b.   Select **Yes** in the displayed dialog box.

          The device restarts automatically while the data is being reset.

•   Reset all the data (This action cannot be undone.)

     Reset all the data to factory settings.

     a.   Select Reset All.

b. Select **Yes** in the displayed dialog box.

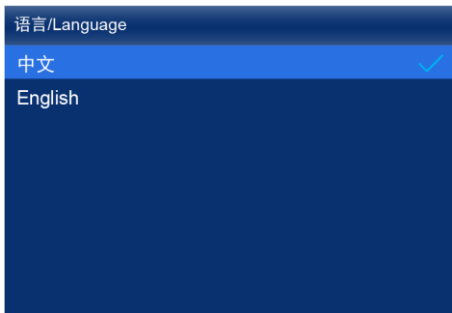The device restarts automatically while the data is being reset.

8 Basic System Settings

8.1 Set Language

Change the system language of the device.

Step 1   On the main menu screen, choose 语言/**Language**.

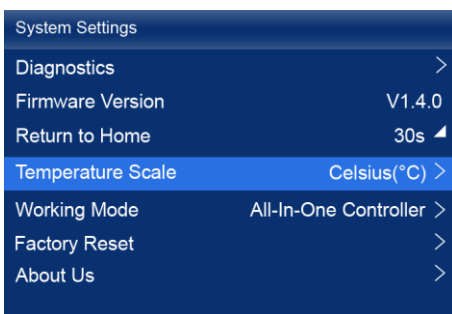Step 2   Choose **中文** or **English** as required.

Figure 8-1 Language

8.2 Set Temperature Scale

Change the system temperature scale of the device.

Step 1   On the main menu screen, choose **System Settings** > **Temperature Scale**.
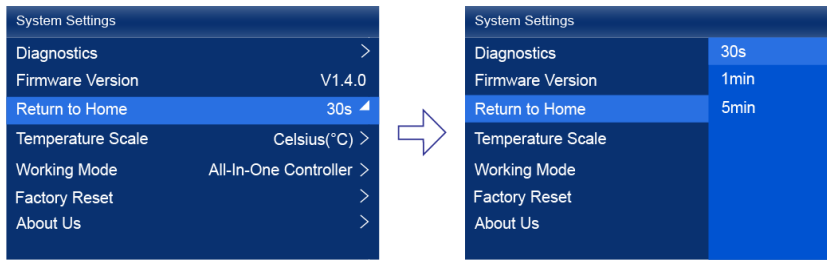
Step 2   Select Celsius(℃) or Fahrenheit(℉) as needed.

8.3 Set Session Timeout

Specify a certain amount of time for session timeout after which the LCD will return to the home screen from another screen automatically if no action is performed during the specified time.

Step 1   On the main menu screen, choose **System Settings** > **Return to Home**.

Figure 8-2 Return to Home

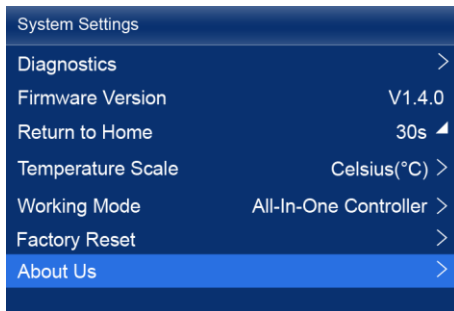Step 2   Select **30s**, **1min** or **5min** from the drop-down options as required.

8.4 View Service Information

View the service information of NovaStar, so that users can consult questions and provide feedback and suggestions.

Step 1   On the main menu screen, choose **System Settings** > **About Us**.

Figure 8-3 About us

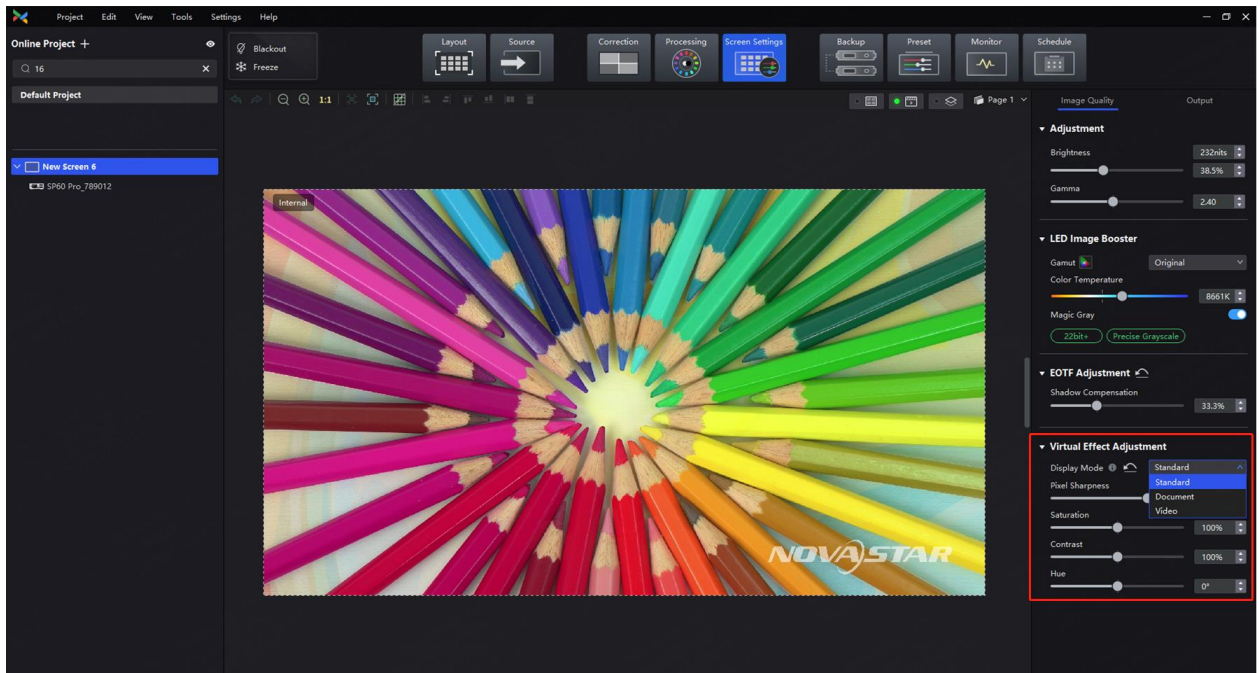Step 2   View the official website, technical support email address and service hotline of NovaStar.

9 Dynamic Sub-Pixel Configuration in VMP

9.1 Set Display Mode

Step 1   Launch VMP, connect to the controller, and set up the screen topology.

Step 2   Select the screen from the project list, and then navigate to the **Screen Settings** tab.

Figure 9-1 Virtual effect adjustment

Step 3   In the **Image Quality** tab under the **Virtual Effect Adjustment** section, choose the display mode that suits your needs:

- Standard: The default mode, designed to be versatile and user-friendly, making it well-suited for most scenarios.

- Video: Ideal for scenarios involving video and image playback. It enhances the visual experience by delivering vibrant and pleasing playback that are especially appealing to the human eye.

- Document: Specifically tailored for scenarios with many lines and texts, such as Word/PPT document display. It ensures a comfortable viewing experience, minimizing eye strain.

Step 4   After choosing a mode, you can fine-tune settings like **Pixel Sharpness**, **Saturation**, **Contrast**, and **Hue** based on the preset mode parameters.
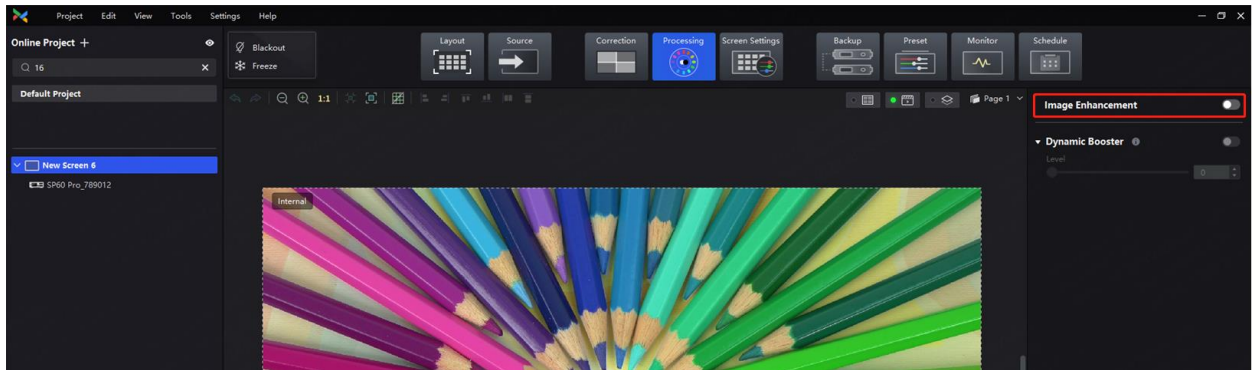
To reset the settings, click the ⬚ button next to **Display Mode**.

9.2 Image Enhancement

Step 1   Launch VMP, connect to the controller, and set up the screen topology.

Step 2   Select the screen from the project list, and then navigate to the **Processing** tab.

Figure 9-2 Image enhancement

Step 3   Enable or disable **Image Enhancement** as needed.

When enabled, this feature improves the display by enhancing contrast, details, and colors. It makes the overall image more detailed and refined, with sharp edge details and vibrant, full colors.

10 Specifications

Electrical Specifications	Power input	100-240V~, 50/60Hz, 1.5A
	Max power consumption	82 W
Operating Environment	Temperature	−20℃ to +50℃
	Humidity	0% RH to 80% RH, non-condensing
Storage Environment	Temperature	−30℃ to +80℃
	Humidity	0% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	482.6 mm × 94.2 mm × 467.0 mm
	Net weight	7.4 kg
	Gross weight	10.2 kg Note: It is the total weight of the product, accessories, and packing materials packed according to the packing specifications.
Packing Information	Packing box	660.0 mm × 570.0 mm × 210.0 mm, kraft paper box
	Accessory box	408.0 mm × 290.0 mm × 50.0 mm, white cardboard box
	Accessories	• 1x Power cord • 1x Ethernet cable • 1x HDMI cable • 1x Certificate of Approval
IP Rating	IP20 Please prevent the product from water intrusion and do not wet or wash the product.	

The amount of power consumption may vary depending on various factors such as product settings, usage, and environment.

11 Video Source Specifications

Input	Resolution		Color Space	Sampling	Bit Depth	Integer Frame Rate (Hz)
HDMI 2.0-1/ HDMI 2.0-2	4K	4096×2160 (Forced)	RGB / YCbCr	4:4:4	10bit	24/25/30/48/50
					8bit	24/25/30/48/50/60
			YCbCr	4:2:2	8/10bit	
		3840×2160	RGB / YCbCr	4:4:4	10bit	24/25/30/48/50
					8bit	24/25/30/48/50/60
			YCbCr	4:2:2	8/10bit	
	2K1K	2560×1440	RGB / YCbCr	4:4:4	10bit	24/25/30/48/50/60/75/100
					8bit	24/25/30/48/50/60/75/100/120
			YCbCr	4:2:2	8/10bit	
		1920×1080	RGB / YCbCr	4:4:4	10bit	24/25/30/48/50/60/72/75/100/120/144
					8bit	24/25/30/48/50/60/72/75/100/120/144/240 (240 Hz needs to be forced)
			YCbCr	4:2:2	8/10bit	

Note

The table above only displays a selection of common resolutions and integer frame rates. Decimal frame rates are also supported, allowing for automatic frame rate adaptation from the highest frame rate of each resolution down to 23.98/29.97/47.95/59.94/71.93/119.88/143.86 Hz.

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.

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