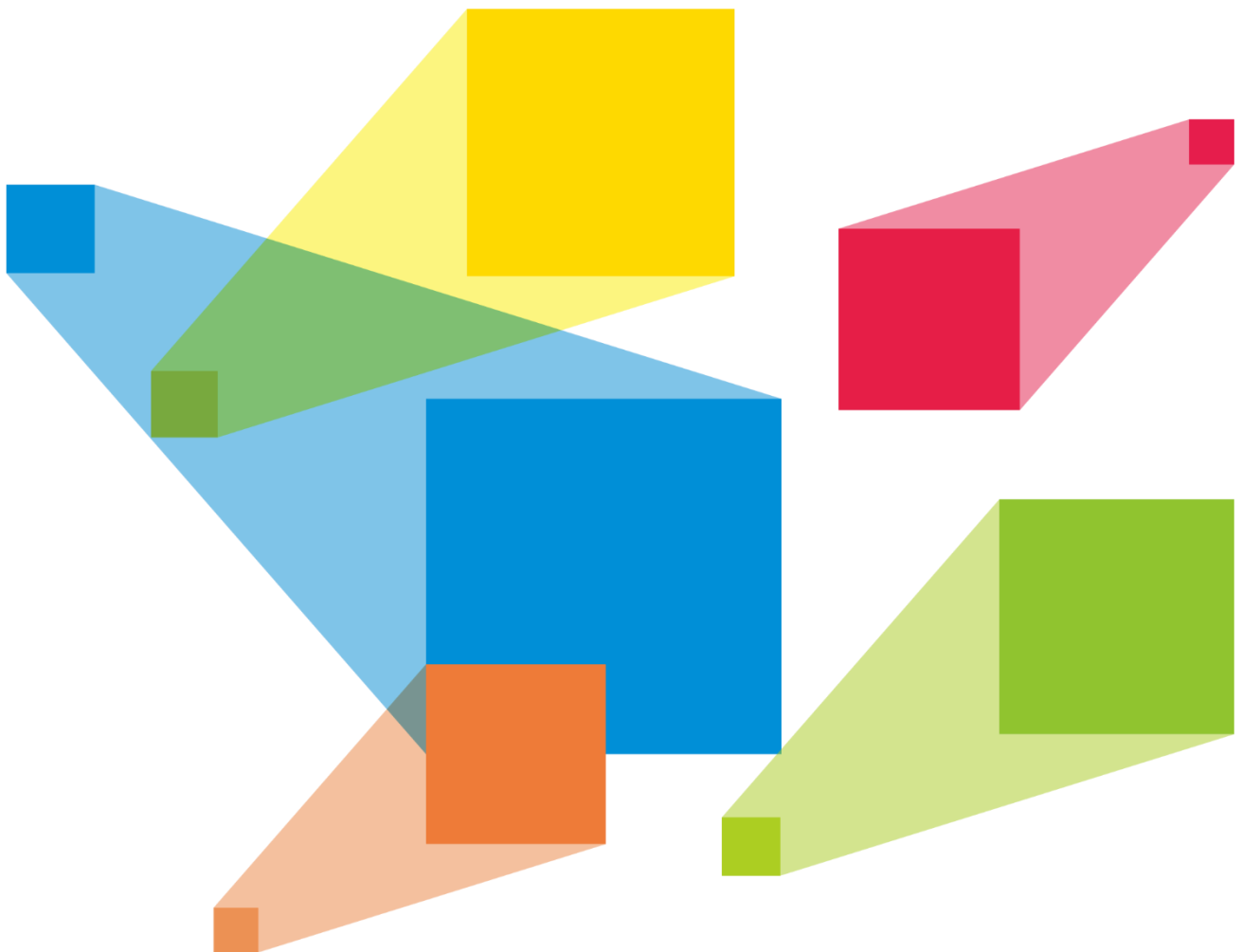


VC6

All-in-One Controller



User Manual

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1 Introduction

The VC6 is NovaStar's new all-in-one controller that integrates video processing and video control into one box. It features 6 Ethernet ports. A VC6 unit can drive up to 3.9 million pixels, with the maximum output width and height up to 10,240 pixels and 8192 pixels respectively, which is ideal for on-site extra-wide and extra-high LED screen control applications.

The VC6 is capable of receiving a variety of video signals and processing high-resolution images. Furthermore, the device features stepless output scaling, OSD, low latency, pixel-level brightness and chroma calibration and more, to present you with an excellent image display experience.

Thanks to its powerful video processing and sending capabilities and other outstanding features, the VC6 can be widely used in fixed LED screen applications.

2 Appearance

2.1 Front Panel



Button	Description
Power switch	Power on or power off the device.
LCD screen	Display the device status, menus, submenus and messages.
Knob	- Rotate the knob to select a menu item or adjust the parameter value. - Press the knob to confirm the setting or operation.
ESC button	Exit the current menu or cancel an operation.
Control area	- Open or close a layer (main layer and PIP layers), and show the layer status. Status LEDs: - On (blue): The layer is opened. - Flashing (blue): The layer is being edited. - On (white): The layer is closed. - SCALE: A shortcut button for the full screen function. Press the button to make the layer of the lowest priority fill the entire screen. Status LEDs: - On (blue): Full screen scaling is turned on. - On (white): Full screen scaling is turned off.
Input source buttons	- Input source switching buttons. Press the button to switch the input source for the main layer. - Button indicators are used to indicate the working status of the input source signal. - On (blue): An input source is accessed. - Flashing (blue): The input source is not accessed but used by the layer. - On (white): The input source is not accessed or the input source is abnormal. Notes: When no layer is not selected, press the input source button to quickly switch the input source for the main layer. When a layer is selected, press the input source button to quickly switch the input source for the selected layer.

Button	Description
Shortcut function buttons	• PRESET: Access the preset settings menu. • FN: A customizable button

Notes:

Hold down the knob and **ESC** button simultaneously for 3s or longer to lock or unlock the front panel buttons.

This product can only be placed horizontally. Do not mount vertically or upside-down.

The product can be mounted in a standard 19-inch rack capable of withstanding at least four times the total weight of the mounted equipment. Four M5 screws should be used to fix the product.

2.2 Rear Panel



Input Connectors		
Connector	Qty	Description
3G-SDI	1	An optional connector • ST-424 (3G), ST-292 (HD) and ST-259 (SD) standard video inputs supported • Max. input resolution: 1920×1080@60Hz • Deinterlacing processing supported • 3G-SDI loop output supported
HDMI 1.3	2	• Max. input resolution: 1920×1200@60Hz • HDCP 1.4 compliant • Custom resolutions supported – Max. width: 3840 pixels (3840×648@60Hz) – Max. height: 2784 pixels (800×2784@60Hz) – 600×3840@60Hz (forced) • DOES NOT support interlaced signal inputs
DVI	1	• Max. input resolution: 1920×1200@60Hz • HDCP 1.4 compliant • Custom resolutions supported – Max. width: 3840 pixels (3840×648@60Hz) – Max. height: 2784 pixels (800×2784@60Hz)

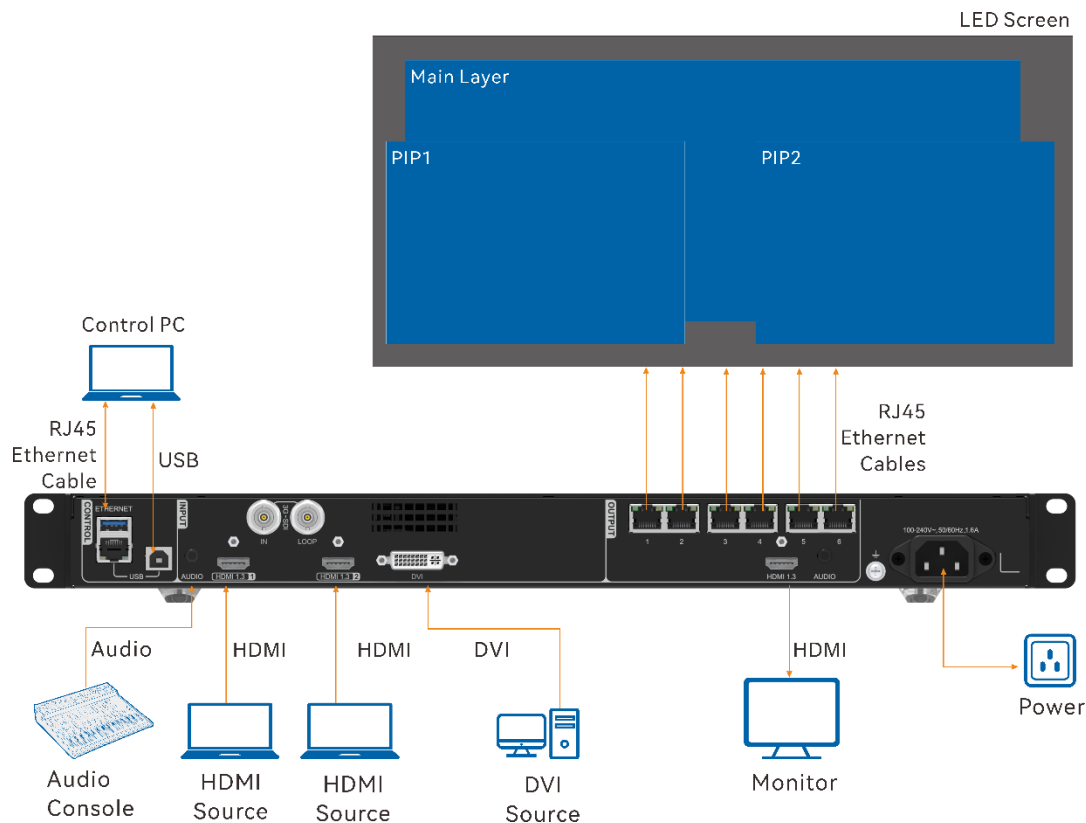
		– 600×3840@60Hz (forced) • DOES NOT support interlaced signal inputs
AUDIO	1	3.5 mm audio input connector
Output Connectors		
Connector	Qty	Description
Ethernet ports	6	Gigabit Ethernet ports • Max. loading capacity: 3.9 million pixels • Max. width: 10,240 pixels • Max. height: 8192 pixels Ethernet ports 1 and 2 support audio output. When you use a multifunction card to parse the audio, be sure to connect the card to Ethernet port 1 or 2. Status LEDs: • The top left one indicates the connection status. – On: The port is well connected. – Flashing: The port is not well connected, such as loose connection. – Off: The port is not connected. • The top right one indicates the communication status. – On: The Ethernet cable is short-circuited. – Flashing: The communication is good and data is being transmitted. – Off: No data transmission
HDMI 1.3	1	• Support monitor and video output modes. • The output resolution is adjustable.
AUDIO	1	3.5 mm audio output connector
Control Connectors		
Connector	Qty	Description
ETHERNET	1	Connect to the control PC and update the firmware program in V-Can. Status LEDs: • The top left one indicates the connection status. – On: The port is well connected. – Flashing: The port is not well connected, such as loose connection. – Off: The port is not connected. • The top right one indicates the communication status. – On: The Ethernet cable is short-circuited. – Flashing: The communication is good and data is being transmitted. – Off: No data transmission

USB	2	• USB 2.0 (Type-B): – Connect to the control PC. – Input connector for device cascading • USB 2.0 (Type-A): Output connector for device cascading
-----	---	--

3 Applications

- Work as a video controller:

The HDMI output connector is used for monitoring.

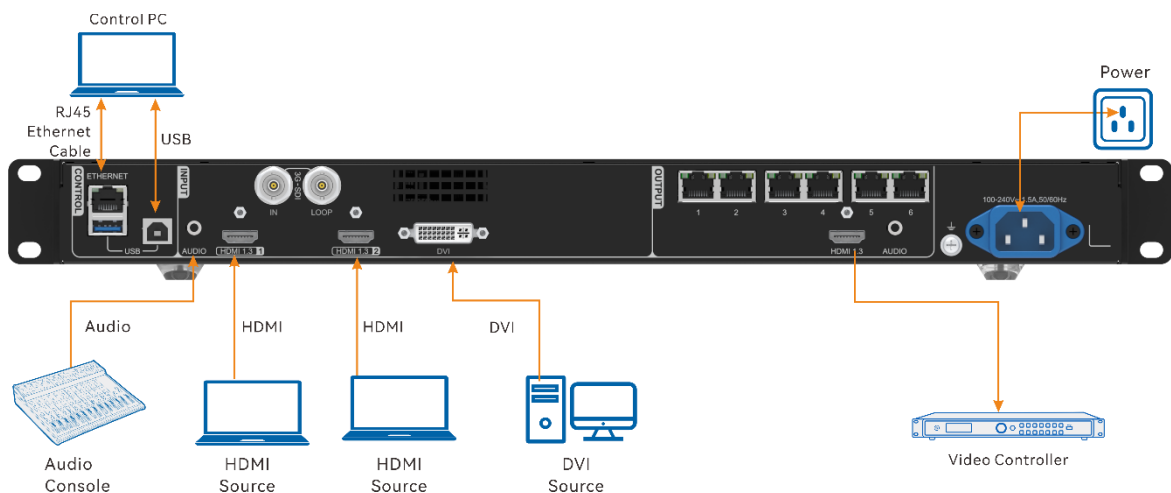


Note:

After the screen configuration is completed, the HDMI 1.3 connector is used for monitoring. Setting the HDMI output mode to **Video Output** will affect the image displayed on the current screen.

- Work as a video converter:

The VC6 can convert a video input to an HDMI output. When it works as a video converter, the HDMI output connector is used for video output and the Ethernet ports are not used for output.



4 Home Screen

Figure 4-1 Home screen



Icon	Description
VC6	The device name
192.168.0.10	The device IP address
• Main • PIP1 • PIP2	The layer input source and resolution
Screen	The current screen resolution
	The screen brightness, 0% (black) to 100% (brightest)
Port	The Ethernet port number and port status • : The Ethernet port is connected and serves as the primary output port. • : The Ethernet port is not connected. • : The Ethernet port is connected and serves as the backup output port. When at the bottom right flashes, there is data transmission on the port.
Synchronization	The sync status and sync source • : The sync function is enabled and the synchronization succeeded. Sync source: HDMI 1 • : The sync function is enabled and the synchronization is in progress. Sync source: HDMI 1

Icon	Description
	: The sync function is enabled but the synchronization failed. Sync source: HDMI 1 : The sync function is not enabled. HDMI 1 indicates the sync source you used last time.
Display control	The output image status : The output image is displayed. : The output is black. : The output image is frozen. : The test pattern is shown.
Connection method	: The device is connected to the control PC via an Ethernet port. : The device is not connected to the control PC. : The device is connected to the control PC via a USB port.

5 Menu Operations

Operating Instructions:

Knob:

- On the home screen, press the knob to enter the operation menu screen.
- On the operation menu screen, rotate the knob to select a menu item and press the knob to confirm the selection or enter the submenu.
- When a menu item with parameters is selected, you can rotate the knob to adjust the parameters. Please note that after the adjustment, you need to press the knob again to confirm the adjustment.

ESC: Exit the current menu or cancel an operation.

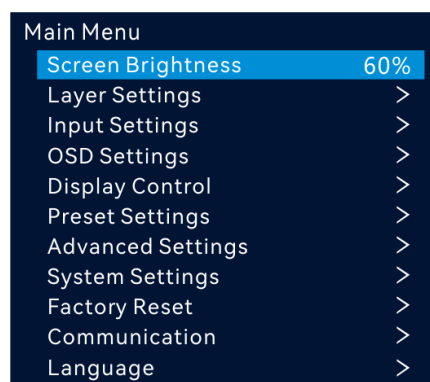
Hold down the knob and **ESC** button simultaneously for 3s or longer to lock or unlock the front panel buttons.

After the settings, if you need to shut down the device, please wait at least 5 seconds; otherwise, the parameter settings may not be saved.

5.1 Screen Brightness

Screen brightness allows you to adjust the LED screen brightness in an eye-friendly way according to the current ambient illuminance. Besides, appropriate adjustment of screen brightness can extend the service life of the LED screen.

Figure 5-1 Screen brightness



- Step 1 On the home screen, press the knob to enter the main menu screen.
- Step 2 Select **Screen Brightness** and press the knob to confirm the selection.
- Step 3 Rotate the knob to adjust the brightness value. You can see the adjustment result on the LED screen in real time. Press the knob to apply the brightness you set when you are satisfied with it.

5.2 Layer Settings

The VC6 supports three layers. The layer properties and settings are shown in [Table 5-1](#).

Table 5-1 Layer properties

Menu	Description
Status	Open or close the layer. The main layer is opened and two PIP layers are closed by default.
Input source	Select an input source for the current layer. Note: Press an input source button on the device front panel to quickly select an input source for the layer.
Scaling Mode	The layer supports the following three scaling modes. • Full Screen: The layer image fills the whole screen. • Pixel to Pixel: The layer image is not scaled but displayed in the original size of the input source or the cropped source. • Custom: Customize the layer size and the output image is scaled according to the layer size.
H Width	Set the layer size in the horizontal direction. The width value of the main layer ranges from 64 to 32768. The width values of the two PIP layers range from 64 to 32768.
V Height	Set the layer size in the vertical direction. The height value of the main layer ranges from 64 to 32768. The height values of the two PIP layers range from 64 to 32768.
Initial X	Set the horizontal distance between the top left corner of the layer and the top left corner of the screen.
Initial Y	Set the vertical distance between the top left corner of the layer and the top left corner of the screen.
Priority	Adjust the layer z-order. The greater the value, the more front the layer. The value ranges from 1 to 3. • 1: The layer locates at the bottom. • 3: The layer locates on the top.
Input Crop	Crop the input source image and display the cropped part on full screen. • Status: Turn on or turn off the cropping function. • H Width: The size of the cropped part in the horizontal direction. The value ranges

Menu	Description
	from 64 to the width of the current input source. • V Height: The size of the cropped part in the vertical direction. The value ranges from 64 to the height of the current input source. • Initial X: Set the start position for the cropping in the horizontal direction. The value defaults to 0. • Initial Y: Set the start position for the cropping in the vertical direction. The value defaults to 0.
Opacity	Set the transparent degree of the layer image. The greater the value, the more opaque the layer image; the smaller the value, the more transparent the layer image. • 0%: Transparent • 100%: Nontransparent

5.2.1 Add Layers

Button Operations

Step 1 Press the **MAIN**, **PIP 1** or **PIP 2** button on the device front panel to quickly open the layer and the device screen displays the corresponding layer settings screen.

- MAIN: Main layer
- PIP1/PIP2: PIP layer 1 and 2

Step 2 Press an input source button to quickly select an input source for the layer.

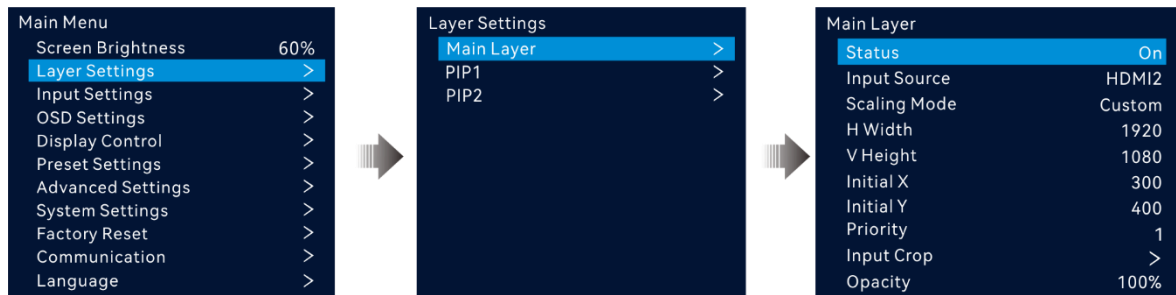
Menu Operations

Step 1 On the home screen, press the knob to enter the main menu screen.

Step 2 Rotate the knob to select **Layer Settings** and press the knob to enter the layer settings screen.

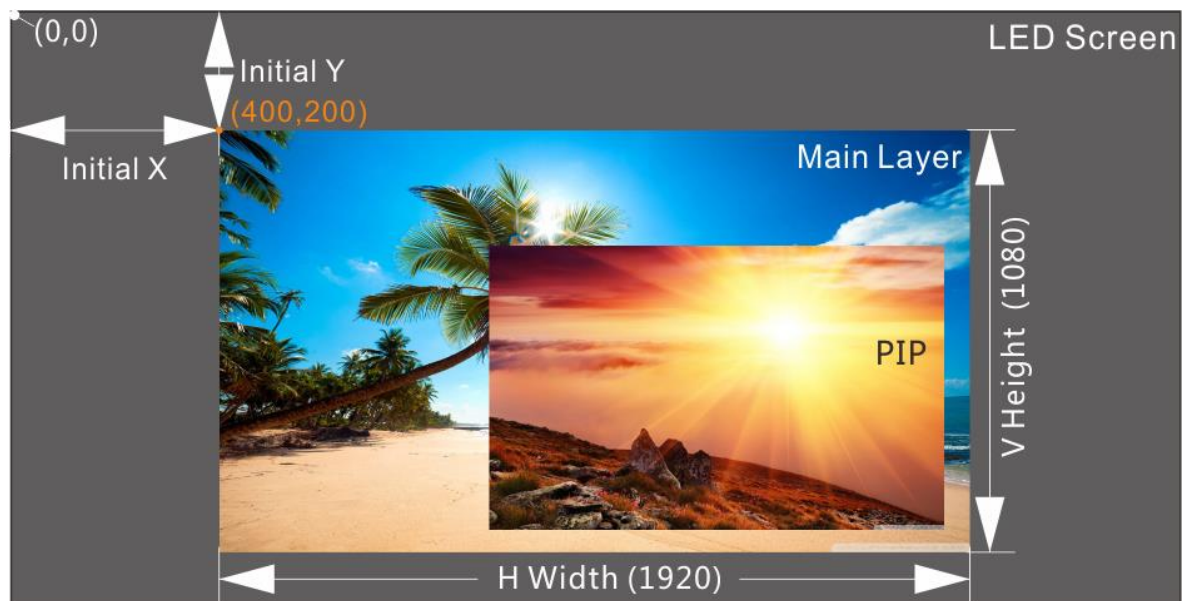
Step 3 Rotate the knob to select **Main Layer**, **PIP 1** or **PIP 2** and press the knob to enter the corresponding settings screen.

Figure 5-2 Layer settings



- Step 4 Select **Status** and press the knob to confirm. Rotate the knob again to select **On** and press the knob to confirm.
- Step 5 Rotate the knob to select **Input Source** and select the desired input source for the layer.
- Step 6 Rotate the knob to select other layer parameters and set them if needed. The layer parameter descriptions are shown in Table 5-1 and Figure 5-3.

Figure 5-3 Layer parameter descriptions



- Step 7 Rotate the knob to select **Priority** and set the layer z-order.

5.2.2 Switch Layer Input Sources

Button Operations

- Step 1 Press the **MAIN**, **PIP 1** or **PIP 2** button on the device front panel to quickly open the layer and the device screen displays the corresponding layer settings screen.

After pressed, the layer button becomes flashing.

Step 2 Press an input source button to quickly switch the layer input source.

Figure 5-4 Switch layer input sources



Notes:

- When switching the input source of the main layer, you do not need to press the **MAIN** button first. Press an input source button directly.
- Press the **SCALE** button to make the bottom layer fill the whole screen quickly.

Menu Operations

Step 1 On the home screen, press the knob to enter the main menu screen.

Step 2 Go to **Layer Settings > Main Layer/PIP 1/PIP 2 > Input Source** to enter the input source settings screen.

Step 3 Rotate the knob to select the target input source and press the knob to confirm.

5.2.3 Input Crop

This function allows you to crop the input source image and make the cropped part display on full screen.

Step 1 On the home screen, press the knob to enter the main menu screen.

Step 2 Go to **Layer Settings > Main Layer/PIP 1/PIP 2 > Input Crop** to enter the input source cropping screen.

Step 3 Select **Status** and press the knob to confirm. Rotate the knob again to select **On** and press the knob to confirm.

Step 4 Rotate the knob to select other cropping parameters and set them if needed. The cropping parameter descriptions are shown in [Table 5-1](#) and [Figure 5-6](#).

Figure 5-5 Input crop

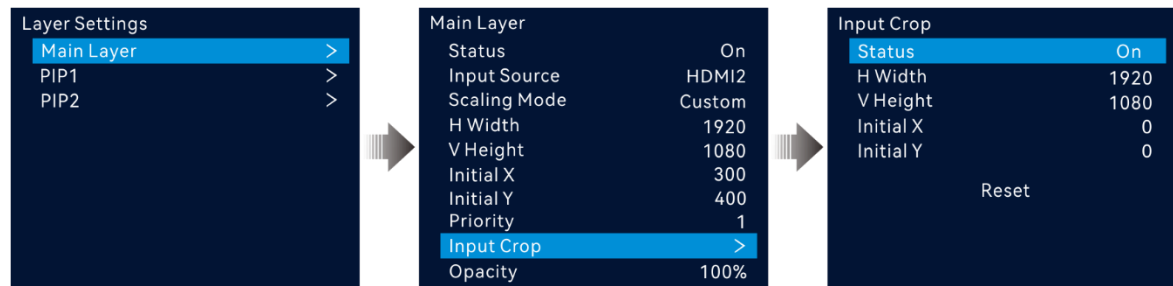
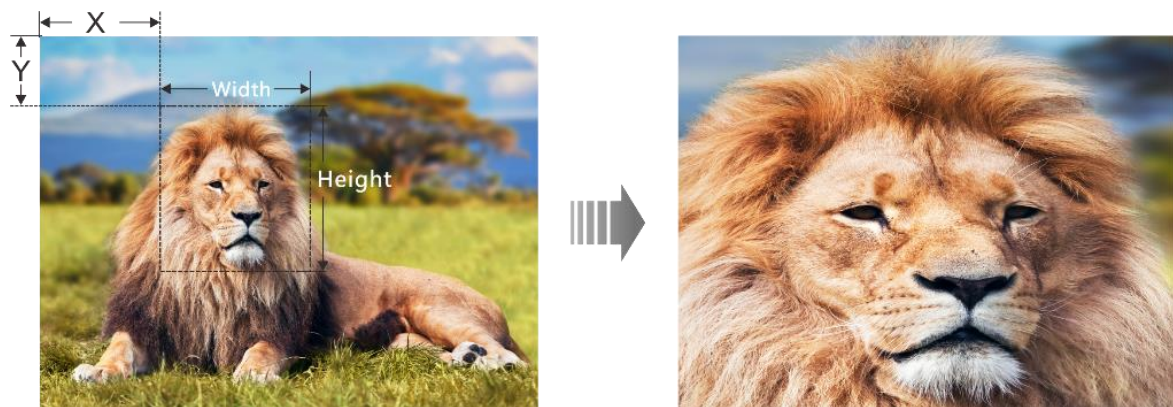


Figure 5-6 Input crop effect



Input Source: 1920×1080@60Hz

Layer Size: 1920×1080

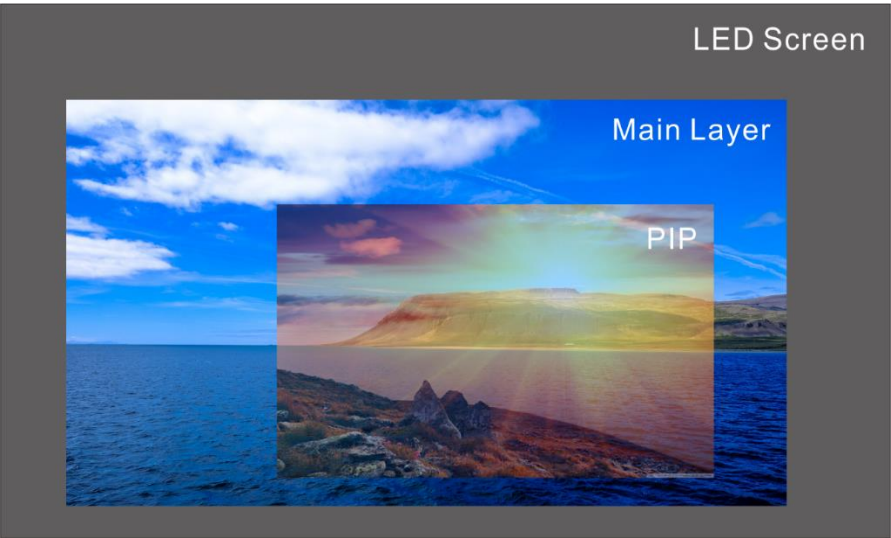
5.2.4 Adjust Layer Opacity

Adjust the layer opacity according to your own needs.

- Step 1 On the main menu screen, go to **Layer Settings > Main Layer/PIP 1/PIP 2 > Opacity**.
- Step 2 Rotate the knob to adjust the opacity percentage and press the knob to confirm.

When the opacity percentage is adjusted, the output image shows the opaque effect in real-time. The PIP layer opacity is 60% in [Figure 5-7](#).

Figure 5-7 Opacity



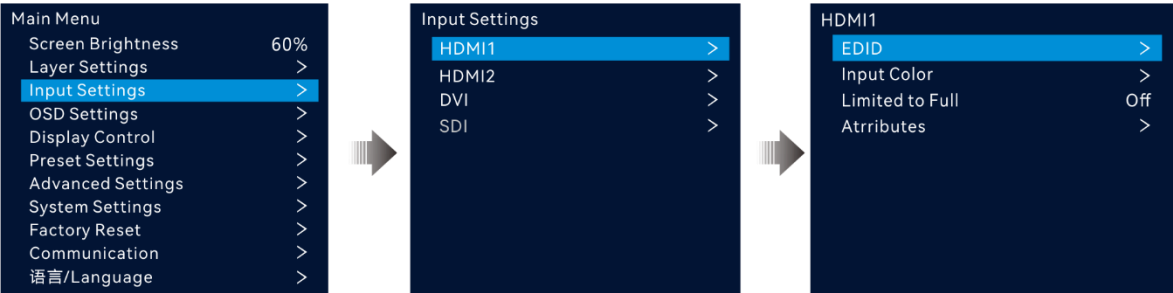
5.3 Input Settings

5.3.1 Input Source Selection

The supported input sources include HDMI 1.3, DVI and 3G-SDI (optional).

Rotate the knob to select the desired input source and press the knob to enter the input source resolution setting screen.

Figure 5-8 Input source selection



5.3.2 Set Input Resolution

When a DVI or HDMI input source is output by a graphics card, the resolution settings are supported. The following two methods are provided to set the input resolution:

- Standard resolution
- Custom resolution

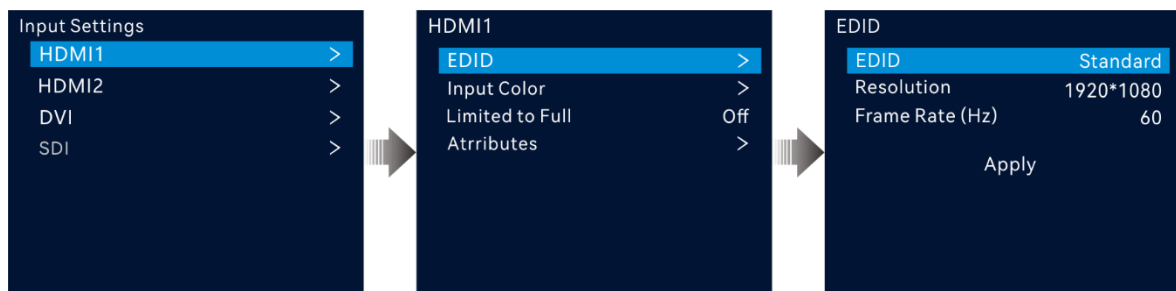
Note:

The SDI input source does not support resolution settings.

Standard Resolution

- Step 1 On the input settings screen, select the desired input source and press the knob to enter the input resolution settings screen.
- Step 2 Select **EDID** and press the knob to enter the EDID settings screen.
- Step 3 Set the EDID mode to **Standard**.
- Step 4 Rotate the knob to select **Resolution**, and press the knob to show the resolution list.
- Step 5 Rotate the knob to select the desired resolution from the list and then press the knob to confirm.
- Step 6 Rotate the knob to select **Frame Rate**, and press the knob to show the frame rate list.
- Step 7 Rotate the knob to select the desired frame rate from the list and then press the knob to confirm.

Figure 5-9 Standard resolution



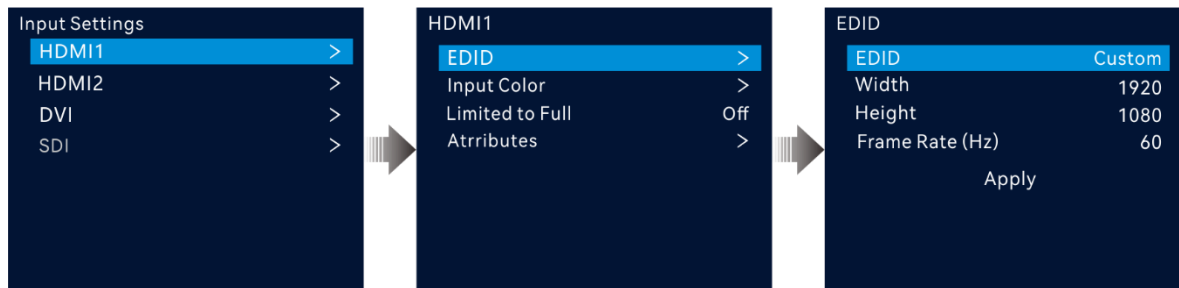
- Step 8 Rotate the knob to select **Apply** and press the knob to complete the standard resolution settings.

Custom Resolution

- Step 1 On the input settings screen, select the desired input source and press the knob to enter the input resolution settings screen.
- Step 2 Select **EDID** and press the knob to enter the EDID settings screen.
- Step 3 Set the EDID mode to **Custom**.
- Step 4 Rotate the knob to select **Width** and press the knob to confirm. Rotate the knob again to select the desired width and press the knob to confirm.
- Step 5 Rotate the knob to select **Height** and press the knob to confirm. Rotate the knob again to select the desired height and press the knob to confirm.

- Step 6 Rotate the knob to select **Frame Rate** and press the knob to show the frame list. Rotate the knob again to select the desired frame rate and press the knob to confirm.

Figure 5-10 Custom resolution



5.3.3 Set Input Source Color

On the input settings screen, select the desired input source and press the knob to enter the input resolution settings screen. Rotate the knob to select **Input Color** and press the knob to enter the input color settings screen. The color parameter descriptions are shown in [Table 5-2](#).

Figure 5-11 Input color

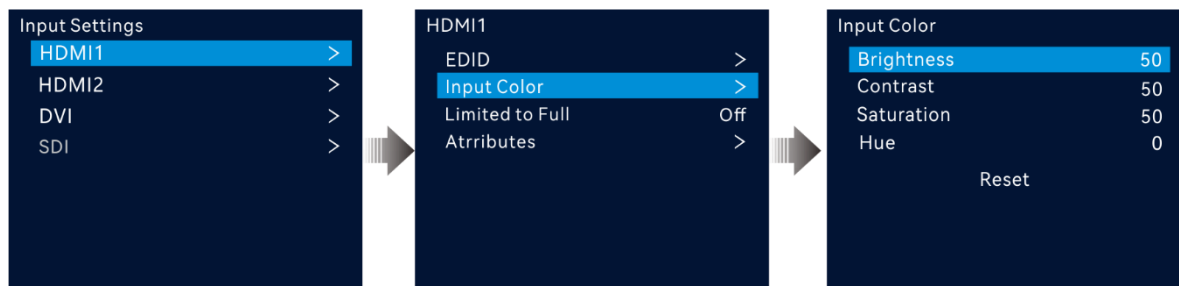


Table 5-2 Input color parameters

Menu	Description
Brightness	Adjust the brightness or darkness of an input source image. The value ranges from 0 to 100 and defaults to 50.
Contrast	Adjust the difference in brightness between light and dark areas of an input source image. The value ranges from 0 to 100 and defaults to 50.
Saturation	Adjust the strength or purity of the colors of an input source image. The larger the saturation, the more vivid the input source image; the smaller the saturation, the larger the image grayscale. The value ranges from 0 to 100 and defaults to 50.
Hue	Adjust the distinction between colors (white, black and gray tones are not

Menu	Description
	included). The value ranges from -180 to +180 and defaults to 0.
Reset	Reset the input color parameters to factory defaults.

5.3.4 RGB Limited to RGB Full

The VC6 can automatically convert the color space of the video source from RGB limited to RGB full, allowing for more accurate video processing.

- Off: Don't convert the color space of the current video source from RGB limited to RGB full.
- On: Convert the color space of the current video source from RGB limited to RGB full. You are advised to turn on this function when the color space of the video source is RGB limited.

5.3.5 Attributes

View the color space and sampling rate of the selected input source. The parameters are read automatically and cannot be set.

5.4 OSD Settings

At most 8 OSD images can be imported and saved via V-Can.

OSD image size: $64 \leq \text{width} \leq 10240$, $64 \leq \text{height} \leq 8192$, $\text{width} \times \text{height} \leq 3.9$ million pixels.

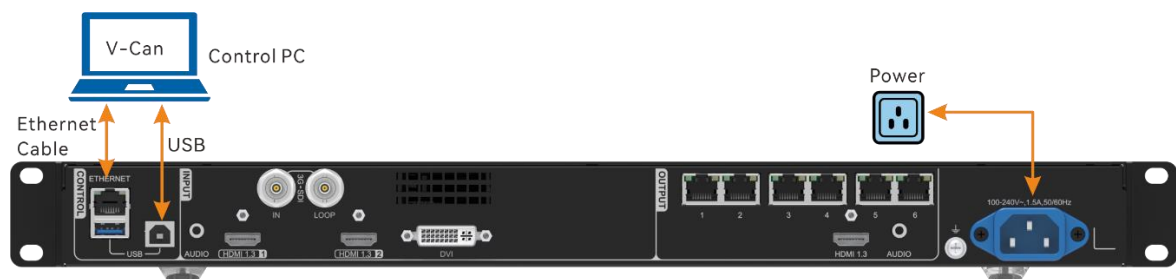
You can crop and scale the OSD image or edit the OSD text in V-Can.

5.4.1 Import OSD

Prerequisites

- You have prepared the OSD image to be imported.
- The VC6 is connected to the control PC where V-Can is installed.

Figure 5-12 Hardware connection



Operating Procedure

Step 1 Start the V-Can software.

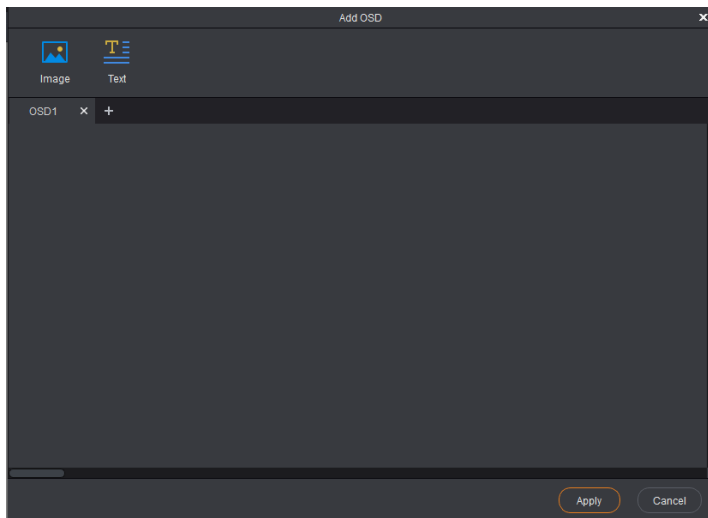
After V-Can is enabled, all the devices on the current new

Step 2 Click **Device** and select the desire VC6 unit in the device list.

Step 3 Click **OSD** to open the OSD settings page.

Step 4 Click  to open the OSD adding window.

Figure 5-13 Add OSD



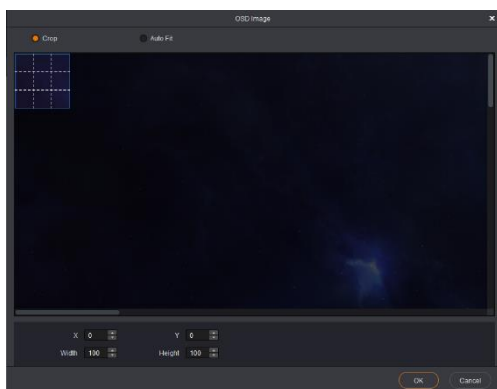
Step 5 Click **Image** to select the desired image on your local computer.

Step 6 Click **Open** to add the image.

OSD image size: The OSD image size cannot exceed 3.9 million pixels with the maximum width and height of 10,240 pixels and 8192 pixels respectively.

- If the image size is greater than 6.5 million pixels, the window appears as shown in [Figure 5-14](#).
 1. Hover the mouse over the edge of the dotted box. When the mouse pointer changes into a double arrow, click and drag the box to adjust the size of the cropped area. You can also directly enter the values for **Width** and **Height** to adjust the size of the cropped area.
 2. Click and drag the dotted box to adjust the position of the cropped area. You can also directly enter the values for **X** and **Y** to adjust the position of the cropped area.
 3. After the settings, click **OK**.

Figure 5-14 Crop OSD

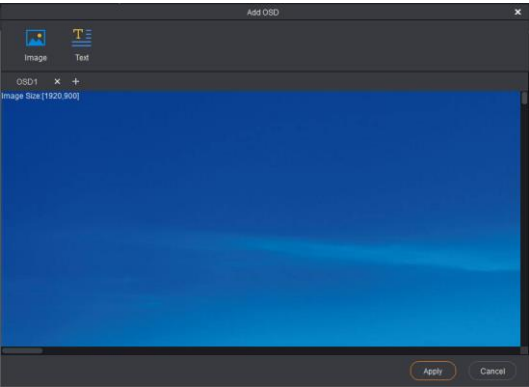


Note:

Select **Auto Fit** to scale the OSD image to meet the OSD size requirement.

- If the image size is less than 6.5 million pixels, the image is added directly as shown in [Figure 5-15](#).

Figure 5-15 Add OSD



Step 7 Click + next to the OSD name to add a new OSD.

Note:

Click **Image** to add a new OSD image, and click **Text** to edit the OSD text as well as change the text properties including font, font size, color, bold, italic and underline.

5.4.2 Add OSD

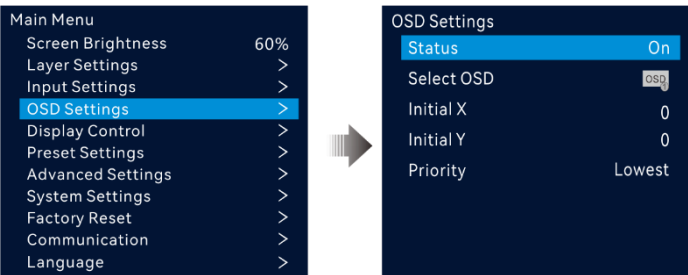
Prerequisites

You have imported the OSD image.

Operating Procedure

- Step 1 Press the knob to enter the main menu screen.
- Step 2 Rotate the knob to select **OSD Settings** to enter the OSD settings screen.

Figure 5-16 OSD settings

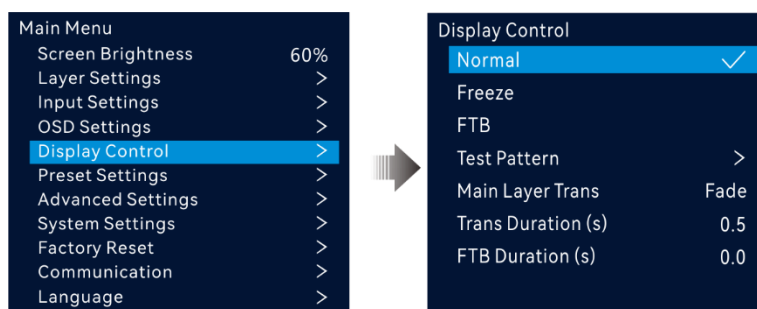


- Step 3 Rotate the knob to select **Status** and press the knob to confirm. Rotate the knob again to select **On** and press the knob to confirm.
- Step 4 Rotate the knob to select **Select OSD** and press the knob to confirm. Rotate the knob again to select the desired OSD image.
- Step 5 Rotate the knob to select **Initial X** and **Initial Y** respectively and press the knob to confirm. Rotate the knob to set the initial position of the OSD image.
- Step 6 Rotate the knob to select **Priority** and press the knob to confirm. Rotate the knob again to set the OSD image priority.
- Highest: The OSD image has the highest priority and will be displayed on top of all the layers.
 - Lowest: The OSD image has the lowest priority and will be displayed at the back of all the layers.

5.5 Display Control

On the main menu screen, rotate the knob to select **Display Control** and press the knob to enter the display control settings screen.

Figure 5-17 Display control



- Normal: Display the content of the current input source.
- Freeze: Freeze the current frame of the output image.
- FTB: Make the output image fade to black.
- Test Pattern: Display the test pattern on the screen.

The test patterns are used to test the display effect of the LED screen and the working status of each LED. The test patterns include **Pure Color**, **Gradient**, **Grid** and more.

- Main Layer Trans: Set the animation presented when the input source of the main layer is being switched to another. Currently, **Fade** and **Cut** are supported.
- Trans Duration (s): Set the time length the transition effect lasts. When **Main Layer Trans** is set to **Fade**, this option is available. The value ranges from 0 to 2.0 and defaults to 0.5.
- FTB Duration (s): Set the time length the FTB process lasts. The value ranges from 0 to 2.0 and defaults to 0.

Note:

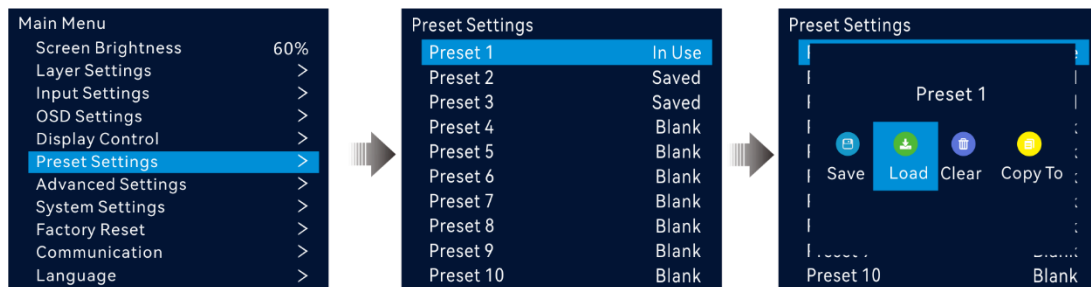
If the freeze or FTB function is turned on, the test pattern function is unavailable.

5.6 Preset Settings

A preset is a set of parameters that save the layer and layer-related information. The VC6 supports ten user-defined presets. After a preset is saved, you can load the preset simply by its name. The preset operations include **Save**, **Load**, **Clear** and **Copy To**.

On the home screen, press the knob to enter the main menu screen. Rotate the knob to select **Preset Settings** and press the knob to enter the preset settings screen.

Figure 5-18 Preset settings



5.6.2 Save Presets

After the layer settings, you can save those settings as a preset.

- Step 1 On the preset settings screen, rotate the knob to select a preset.
- Step 2 Press the knob to open the preset operations window.
- Step 3 Rotate the knob to select **Save** and press the knob to save the layer settings to this preset.

After a preset is saved, the preset status on the right side changes to **Saved**.

Note:

The layer settings data include the layer status, input source, size, initial position, priority, input cropping, opacity and input source color.

5.6.3 Load Presets

This operation allows you to send a saved preset to an LED screen.

- Step 1 On the preset settings screen, rotate the knob to select a saved preset.
- Step 2 Press the knob to open the preset operations window.

Step 3 Rotate the knob to select **Load** and press the knob to load the preset.

After a preset is loaded, the preset status on the right side changes to **In Use**.

5.6.4 Clear Presets

This operation allows you to clear the data saved in the preset. The preset name will not be cleared. After a preset is cleared, the preset status on the right side changes to **Blank**.

Step 1 On the preset settings screen, rotate the knob to select a saved preset.

Step 2 Press the knob to open the preset operations window.

Step 3 Rotate the knob to select **Clear** and press the knob to open a confirmation window.

Step 4 Rotate the knob to select **Yes** and press the knob to clear the preset.

5.6.5 Copy Presets

This operation allows you to copy the layer data in a saved preset to another preset.

Step 1 On the preset settings screen, rotate the knob to select a saved preset.

Step 2 Press the knob to open the preset operations window.

Step 3 Rotate the knob to select **Copy To** and press the knob to go back to the preset settings screen.

Step 4 Rotate the knob to select the target preset and press the knob to confirm.

After the copying, the status of the target preset changes to **Saved**.

5.7 Advanced Settings

The advanced settings allow you to set the device backup, Ethernet port backup test, input backup, synchronization, HDMI output, screen configuration, audio, input HDCP and low latency.

5.7.1 Device Backup

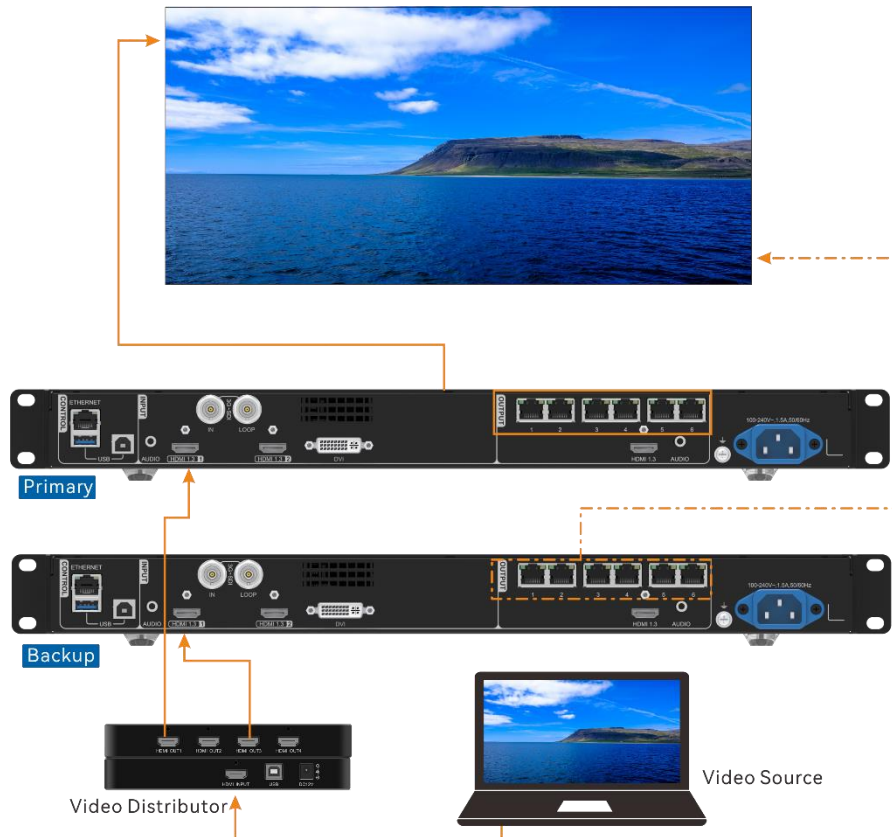
The VC6 supports both the backup between devices and Ethernet ports.

Backup Between Devices

Device backup allows you to set the backup relationship between two devices. You can set one of the devices as the primary device or the backup device. When the primary device has a problem or the primary device's Ethernet cable fails, the backup device will take over the responsibilities of the primary device seamlessly and continue to work well to ensure the LED screen will not go black.

- The connection diagram for the device backup:

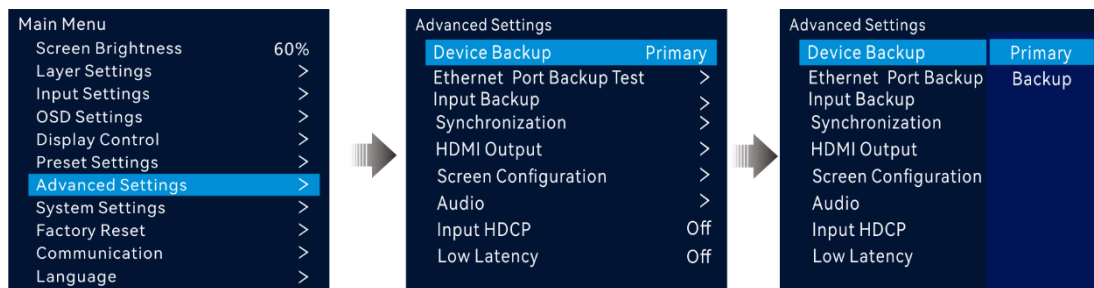
Figure 5-19 Device backup connection



- The setting procedure for the device backup:

Step 1 On the main menu screen, go to **Advanced Settings > Device Backup** to enter the device backup screen.

Figure 5-20 Device Backup



Step 2 Rotate the knob to select **Primary**.

Follow the same procedure to set the other device as **Backup**.

Notes:

In the device backup mode, the quantity of the cabinets loaded by each Ethernet port on both the primary and backup devices must be the same, but their data flow must be in a reversed way.

The layers and layer property settings on both the primary and backup devices must be the same.

Backup between Ethernet Ports

Ethernet port backup allows you to set the backup relationship between two Ethernet ports. When the primary port has a problem or the primary port's Ethernet cable fails, the backup port will take over the responsibilities of the primary port seamlessly and continue to work well to ensure the LED screen will not go black. When setting the backup between the Ethernet ports, you need to complete it in NovaLCT.

- The connection diagram for the Ethernet port backup:

Figure 5-21 Ethernet port backup connection



- The setting procedure for the Ethernet port backup:

- Step 1 Run the NovaLCT software. On the menu bar, go to **User > Advanced Synchronous System User Login**. Enter the password and click **Login**.
- Step 2 Click **Screen Configuration** to enter the screen configuration page.
- Step 3 Click **Next** to enter the screen configuration page.

Figure 5-22 Screen configuration

The screenshot shows the 'Screen Configuration-COM99' window with the following sections:

- Display Mode:** Includes a 'Refresh' button and fields for 'Current Display Mode', 'Sending Card', 'Graphics Output R...', '1920 x 1080', and 'Curre...'.
- Select Input Source:** Features a 'Video Input' dropdown, an 'Automati...' checkbox, a 'Send' button, a '3D Function' section with an 'Enable' checkbox and 'Settings' button.
- Source Configuration:** Includes 'Source' (HDMI), 'Resolution' (1920 x 1080 px), 'Refresh Rate T...' (60 Hz), 'Input Source Bit De...' (8 Bit), and a 'Set' button.
- Hot Backup Verification:** Includes a 'Verify' button.
- Redundancy:** Includes checkboxes for 'Set the Current Devi...' (Set as Primary) and 'Set as Backup', and a 'Set' button.
- Primary/Backup Table:** A table with columns for 'Serial Number of Primary Sending Card', 'Serial Number of Primary Port', 'Serial Number of Backup Sending Card', and 'Serial Number of Backup Port'. Below the table are 'Refresh', 'Send', 'Add', 'Edit', and 'Delete' buttons.
- Footer:** Includes 'Restore Factor', 'Export Screen M...', 'Save System Co.', 'Save', and 'Close' buttons.

Step 4 Select the **Sending Card** tab, and then click **Add** in the **Redundancy** area.

Step 5 Set the serial numbers of both the primary device and backup device to **1**.

Step 6 Set the serial number of the primary port and the serial number of the corresponding backup port.

Figure 5-23 Ethernet port backup

The screenshot shows the 'Redundancy Settings' dialog box with the following fields and buttons:

- Serial Number of Primar...:** Two input fields, both containing the value '1'.
- Serial Number of Backu...:** Two input fields, both containing the value '1'.
- Buttons:** 'Add' and 'Close' buttons at the bottom.

Step 7 Click **Add** to complete the backup settings of an Ethernet port, and the system will automatically list the primary ports and backup ports.

Figure 5-24 Primary Ethernet ports



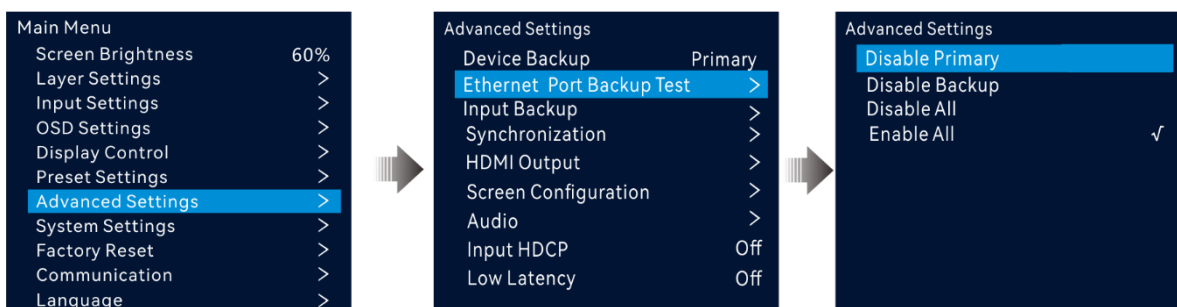
Step 8 Repeat [Step 6](#) and [Step 7](#) to complete the backup settings for other Ethernet ports.

5.7.2 Ethernet Port Backup Test

The VC6 supports the Ethernet port backup test. You can test whether the pre-stored images, backup Ethernet ports and devices take effect without plugging and unplugging the Ethernet cables.

Menu	Description
Disable Primary	Disable the output of the primary Ethernet port on the current device to test whether the backup port or device takes effect.
Disable Backup	Disable the output of the backup Ethernet port on the current device to test whether the output of the primary port is normal.
Disable All	Disable the output of all the Ethernet ports on the current device to test whether the pre-stored image or backup device takes effect.
Enable All	Enable the output of all the Ethernet ports on the current device to complete the test.

Figure 5-25 Ethernet port backup test

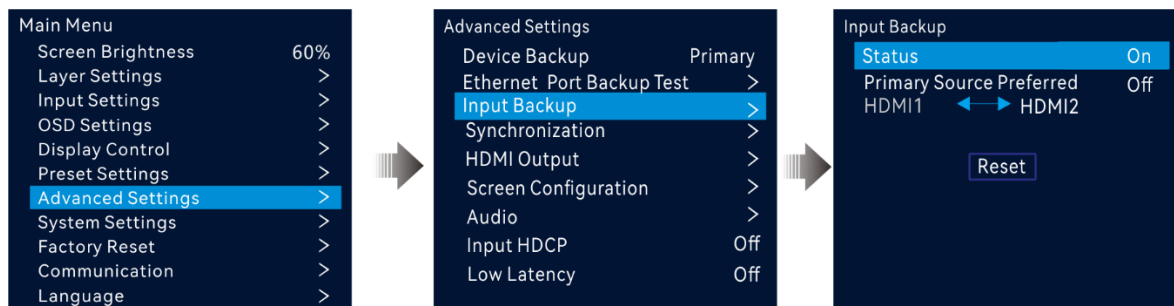


5.7.3 Input Backup

Input backup allows you to set the backup relationship between two input sources. When one input source has a problem or the input connector fails, the backup source will be used seamlessly and continue to work well to ensure the LED screen will not go black.

- Step 1 On the main menu screen, go to **Advanced Settings > Input Backup** to enter the input backup settings screen.

Figure 5-26 Input source backup



- Step 2 Rotate the knob to select **Status** and press the knob to confirm. Rotate the knob again to select **On** and press the knob to confirm.
- Step 3 Rotate the knob to select the desired input source on the right side.

Input backup rules:

- In the backup group, two HDMI sources serve as the backup for each other.
- Restrictions on input backup functions:

HDMI 1 and HDMI 2 form a hot backup group. The current input source of the layer is HDMI 1.

- HDMI 1: No signal. HDMI 2: Signal

The layer input source is switched to HDMI 2 automatically. When HDMI 1 resumes and HDMI 2 still has a signal, the layer input source will not be changed.

- HDMI 1: No signal. HDMI 2: Signal

The layer input source is switched to HDMI 2 automatically. When HDMI 1 resumes, but HDMI 2 does not have a signal, the layer input source will be changed to HDMI 1.

- HDMI 1: No signal. HDMI 2: No signal

The layer input source will not be changed.

- HDMI 1: Signal. HDMI 2: No signal

If you manually switch the layer input source to HDMI 2, the source will automatically switch to HDMI 1.

- Step 4 Set the primary source preferred.

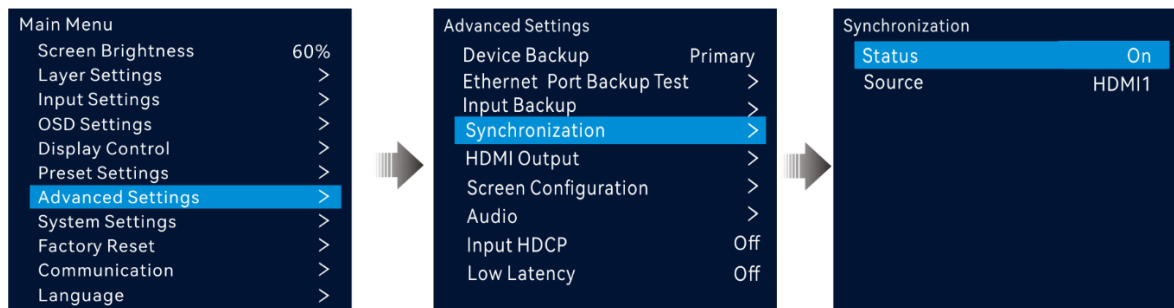
- On: HDMI 1 will always be used if there is a signal. When HDMI 1 fails, the layer input source is switched to HDMI 2 automatically. Once HDMI 1 resumes, the layer input source seamlessly switches back to HDMI 1.
- Off: The layer input source will be switched to HDMI 1 only when HDMI 2 fails and HDMI 1 has a signal.

5.7.4 Synchronization

This function allows you to select a synchronization signal to synchronize all the cascaded device units or synchronize the primary and backup devices to display the output images of all the units in sync.

- Step 1 On the main menu screen, go to **Advanced Settings > Synchronization** to enter the synchronization settings screen.

Figure 5-27 Synchronization



- Step 2 Rotate the knob to select **Status** and press the knob to confirm. Rotate the knob again to select **On** and press the knob to confirm.
- Step 3 Rotate the knob to select **Source** and press the knob to confirm. Then rotate the knob again to select the desired sync source.

Note:

If two or more VC6 units load an LED screen, the sync sources used by each device must be the same.

5.7.5 HDMI Output

The VC6 supports two HDMI output modes: **Monitor** and **Video Output**. The output resolution adjustment is also supported.

Note:

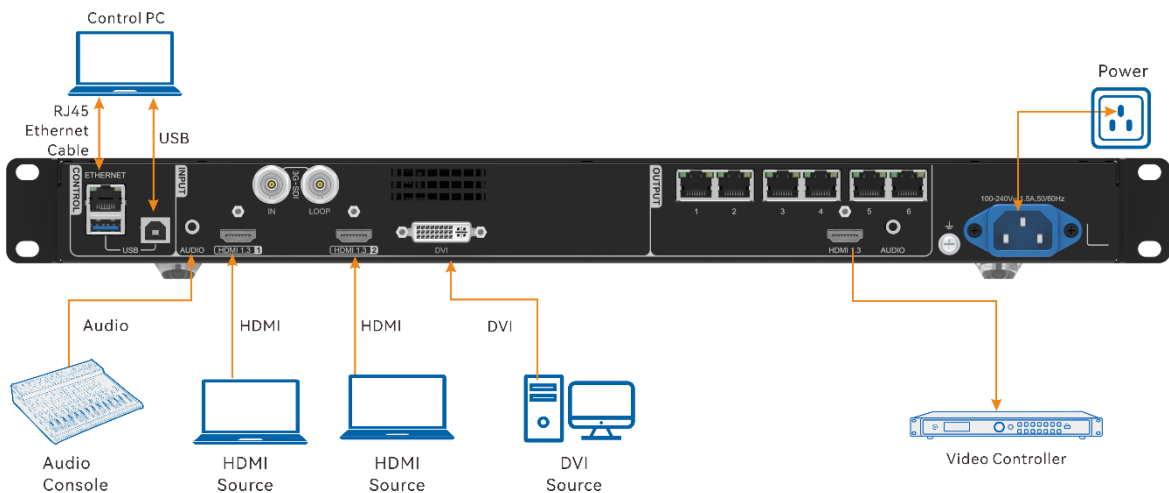
After the screen configuration is completed, setting the HDMI output mode to **Video Output** will affect the image displayed on the current screen.

If the HDMI output mode is set to **Video Output**, the 3D mode is not supported.

The following resolutions are supported on the HDMI output connector.

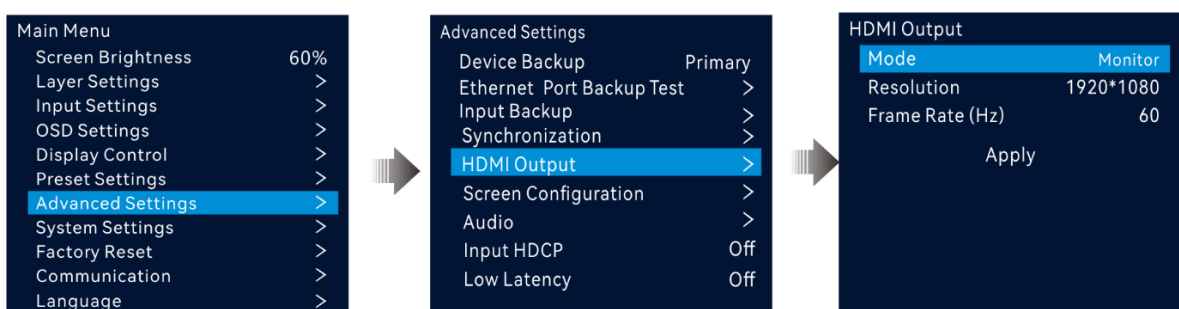
- 1024×768@48/50/59.94/60/75/85Hz
- 1280×720@23.98/24/25/29.97/30/48/50/59.94/60Hz
- 1280×1024@48/50/59.94/60/75/85Hz
- 1366×768@50/59.94/60Hz
- 1440×900@60/75/85Hz
- 1600×1200@48/50/59.94/60Hz
- 1680×1050@60Hz
- 1920×1080@23.98/24/25/29.97/30/48/50/59.94/60Hz
- 1920×1200@50/59.94/60Hz

Figure 5-28 HDMI output



- Step 1 On the main menu screen, go to **Advanced Settings > HDMI Output** to enter the HDMI output settings screen.

Figure 5-29 HDMI output



- Step 2 Select **Mode** to set the desired output mode for the HDMI connector.

The supported modes include **Monitor** and **Video Output**.

- **Monitor:** Scale the screen image according to the output resolution and frame rate of the HDMI connector and output the scaled image, allowing for perfect display on the backend display and receiving devices.
- **Video Output:** Process and output the image received by the VC6.

Step 3 Select **Resolution** to set the desired resolution for the connector.

Step 4 Rotate the knob to select **Frame Rate (Hz)** to set the desired frame rate for the connector.

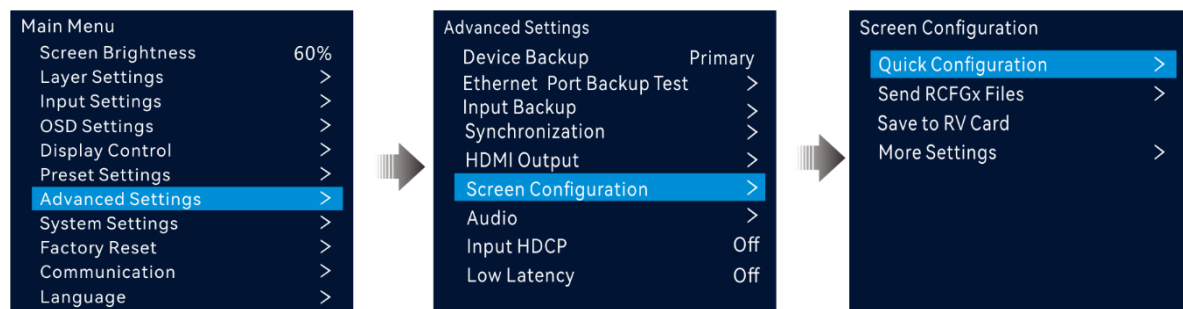
Step 5 Rotate the knob to select **Apply** to make the settings take effect.

5.7.6 Screen Configuration

Screen configuration allows you to perform the following operations, including configuring the screen, sending the cabinet configuration file, saving configuration to the receiving card, changing LED screen color, setting output frame rate and output mapping.

On the main menu screen, go to **Advanced Settings > Screen Configuration** to enter the screen configuration screen.

Figure 5-30 Screen configuration



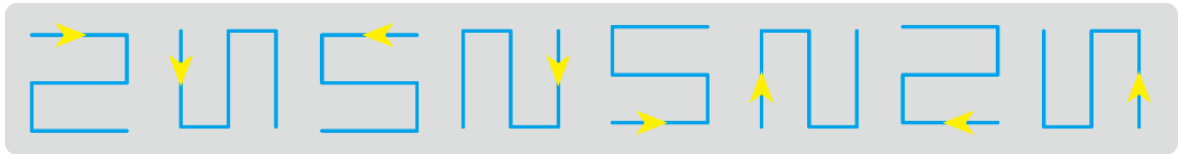
5.7.6.1 Quick Configuration

When the LED screen is a regular one composed of cabinets from the same batch, you can use the quick configuration function to configure the LED screen.

Prerequisites

- The LED screen must be a regular one.
- The cabinets of the screen must be regular cabinets with the same resolution.
- The following data flow settings are supported. During data flow settings, ensure that each port's physical connection is along the same direction and downward to the next one.
- During data flow settings, ensure that Ethernet Port 1 is at the beginning of the actual physical connection.

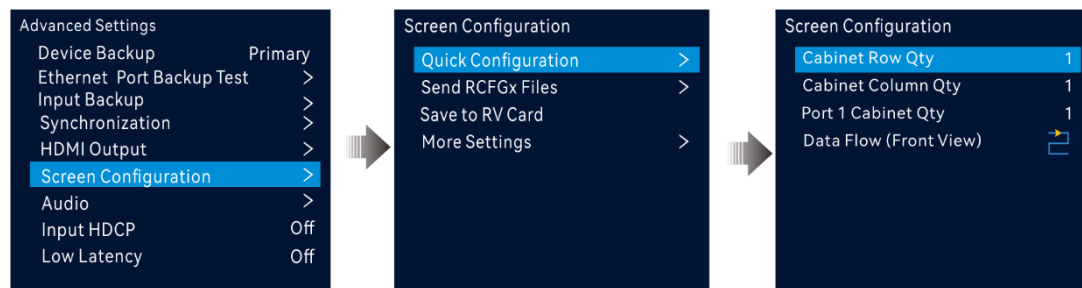
Figure 5-31 Data flow



Operating Procedure

- Step 1 On the main menu screen, rotate the knob to go to **Advanced Settings > Screen Configuration > Quick Configuration** to enter the quick configuration screen.
- Step 2 Set **Cabinet Row Qty** and **Cabinet Column Qty** according to the cabinets' actual row and column quantities.

Figure 5-32 Quick configuration



- Step 3 Rotate the knob to select **Port 1 Cabinet Qty** to set the quantity of the cabinets loaded by Ethernet port 1.

Notes:

Cabinets loaded by Ethernet port 1 $\geq$ cabinets loaded by Ethernet port 2 $\geq$... $\geq$ cabinets loaded by Ethernet port 6

The number of cabinets loaded by each Ethernet port must be an integer multiple of Cabinet Row Qty or Cabinet Column Qty of the screen.

The total pixels of the cabinets loaded by Ethernet port 1 cannot exceed 650,000.

- Step 4 Rotate the knob to select **Data Flow (Front View)** and press the knob to confirm. Select a physical connection for the cabinets.

During data flow settings, you can see the result on the LED screen in real-time. If the entire screen displays content correctly, that is, no overlapping or repetition, press the knob to save the settings.

5.7.6.2 Send Cabinet Configuration File

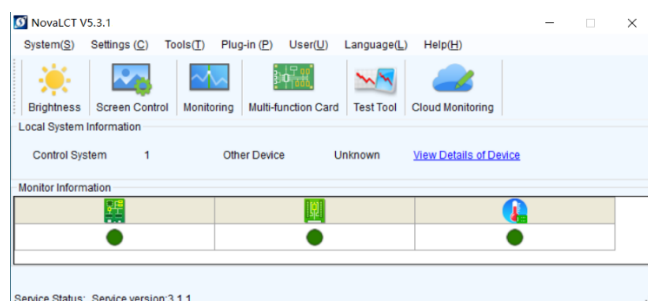
After the LED screen is powered on, if a cabinet or the whole LED screen can not be lit, you can update the configuration file in the cabinet and re-light the cabinet by using this function. Then you can perform the screen configuration and the screen can display the output image as usual.

The cabinet configuration file is a file with the suffix ".rcfgx", which stores the module, cabinet, data flow information and more.

Add Cabinet Configuration File

Step 1 Run the NovaLCT software. On the menu bar, go to **User > Advanced Synchronous System User Login**.

Figure 5-33 Log in to NovaLCT



Step 2 Go to **Tools > Controller Cabinet Configuration File Import** to enter the controller cabinet configuration file importing page.

Figure 5-34 Import cabinet configuration file



Step 3 Click **Add Configuration File** and select the desired file from the window that appears.

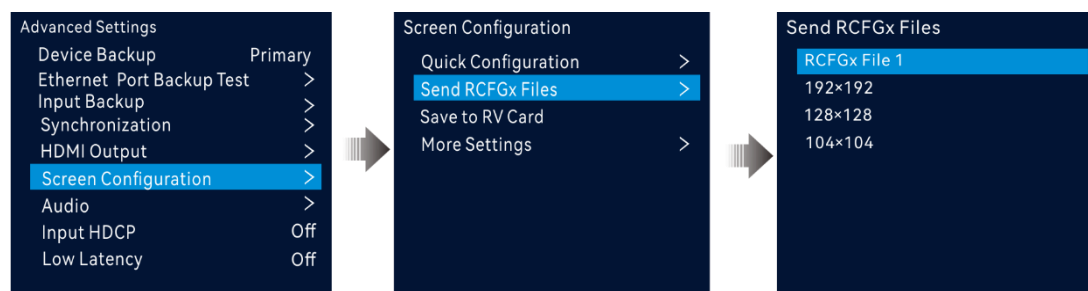
Step 4 Click **Save the Change to HW** to save the configuration file to the device.

Send Cabinet Configuration File

After you have added the cabinet configuration file to the device via NovaLCT, you can send the configuration file to the receiving cards in the cabinets of the LED screen.

- Step 1 On the main menu screen, rotate the knob to go to **Advanced Settings > Screen Configuration > Send RCFGx Files**.
- Step 2 Rotate the knob to select the desired configuration file and press the knob to confirm. The system will automatically send the selected file to all the receiving cards of the LED screen.

Figure 5-35 Send cabinet configuration file



5.7.6.3 Save to RV Card

After the screen configuration information is sent to the receiving card, you can save the configuration to the card by using this function so that the configuration data will not be lost after a power failure.

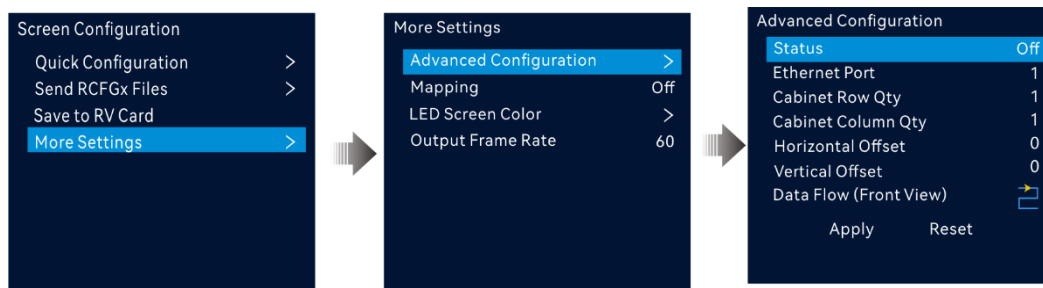
On the main menu screen, go to **Advanced Settings > Screen Configuration > Save to RV Card** and press the knob to confirm.

5.7.6.4 Advanced Configuration

You can set the cabinet row and column quantities, horizontal offset, vertical offset and data flow of the cabinets loaded by a single Ethernet port.

- Step 1 On the main menu screen, go to **Advanced Settings > Screen Configuration > More Settings > Advanced Configuration** to enter the advanced configuration screen.
- Step 2 Set the status to **On** to enable the advanced configuration function.

Figure 5-36 Advanced configuration



Step 3 Select the desired Ethernet port.

Step 4 Set the row and column quantities of the cabinets loaded by the current Ethernet port.

Step 5 Set the horizontal and vertical offsets of the first cabinet loaded by the current Ethernet port.

The offset value indicates the distance between the top left corner of the loading area and the top left corner of the whole screen. The offset value unit is pixel.

Step 6 Select the desired data flow for the cabinets.

5.7.6.5 Mapping

Mapping is used to show the relations between the cabinets of the LED screen and the sending devices so that you can view or check the connections between the cabinets.

Note:

The receiving cards that are connected to the device must support the Mapping function. For the supported models of the receiving cards, please visit our official website at www.novastar.tech.

On the main menu screen, go to **Advanced Settings > Screen Configuration > More Settings > Mapping** and turn on the function.

Figure 5-37 Mapping



P:05 indicates the Ethernet port number of the sending device.

#001 shows the number of the cabinet loaded by the Ethernet port.

5.7.6.6 LED Screen Color

This function allows you to adjust the color temperature and Gamma value of the LED screen to make the images displayed on the screen more clear and vivid.

On the main menu screen, go to **Advanced Settings > Screen Configuration > More Settings > LED Screen Color** to enter the screen color settings screen.

- Select **Gamma** and press the knob to confirm. Rotate the knob to adjust the Gamma value and press the knob to confirm when you are satisfied with it.
- Rotate the knob to select **Temperature** and press the knob to confirm. Rotate the knob to adjust the temperature mode, including **Standard**, **Cool**, **Warm** and **Custom**, and then press the knob to confirm when you are satisfied with it.

When **Custom** is selected, you can customize the color temperature by adjusting the R, G and B values individually.

Table 5-3 LED color parameter descriptions

Parameter	Description
Gamma	Adjust the image distortion degree from the input to output. The greater the value is,

	the more distorted the image will be. The value ranges from 0.25 to 4.00 and defaults to 2.8.
Temperature	Adjust the cool or warm degree of images displayed on the LED screen. When Custom is selected, you can customize the color temperature by adjusting the R, G and B values individually.

5.7.6.7 Output Frame Rate

This function allows you to set the frame rate of the output. The frame rate defaults to 60 Hz.

On the main menu screen, go to **Advanced Settings > Screen Configuration > More Settings > Output Frame Rate**. Rotate the knob to select the desired frame rate and press the knob to confirm.

The supported frame rates include 23.98Hz, 24Hz, 25Hz, 29.97Hz, 30Hz, 47.95Hz, 48Hz, 50Hz, 59.94Hz, 60Hz, 71.93Hz, 72Hz, 75Hz and 85Hz.

5.7.7 Audio

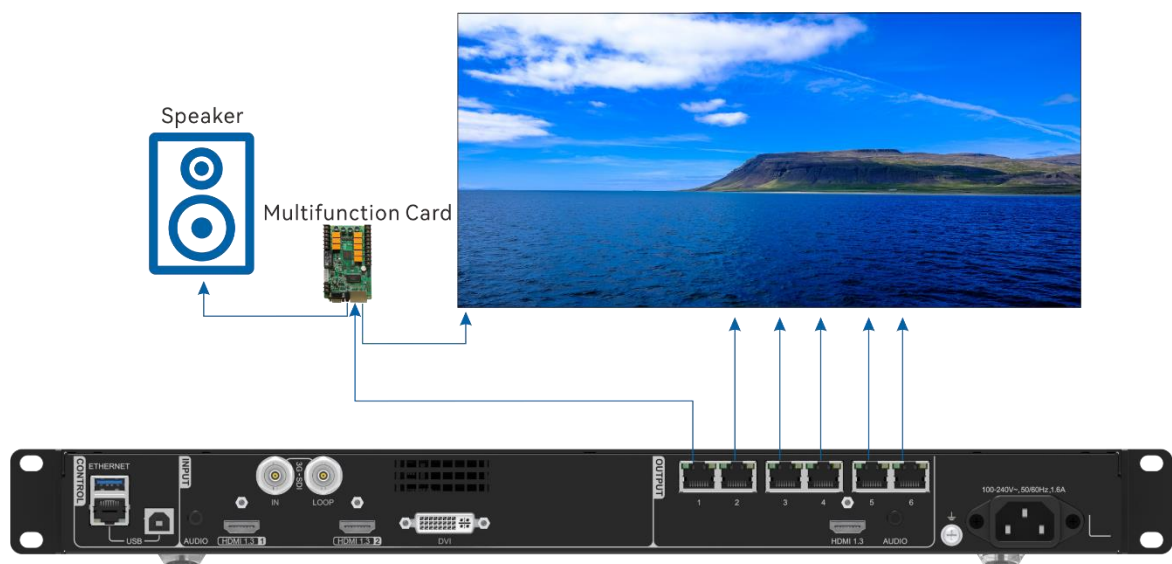
This function allows you to set the audio output, audio volume and input audio.

The audio connection methods are as follows.

- Via a multifunction card

Connect the Ethernet port 1 or 2 to a multifunction card, and then connect the multifunction card to an external speaker.

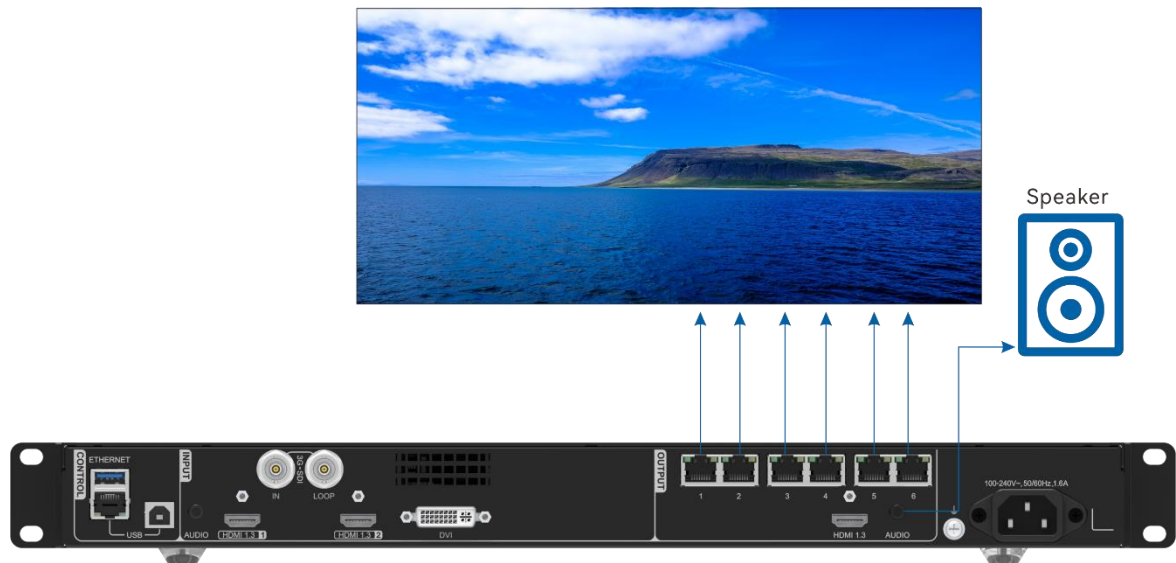
Figure 5-38 Audio output connection-1



- Via the audio output connector

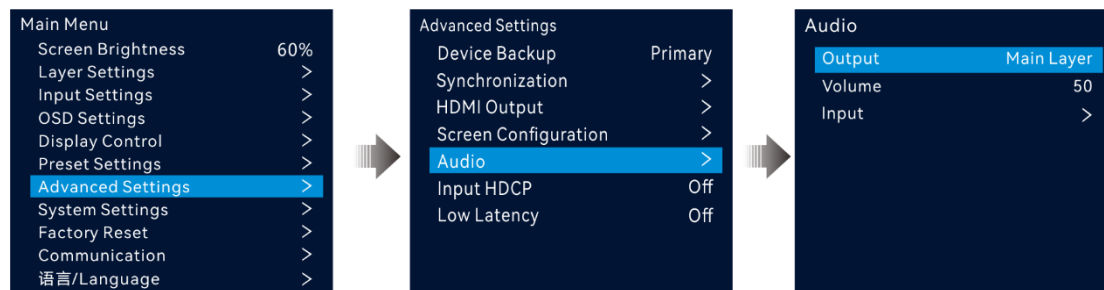
Connect the audio output connector to an external speaker.

Figure 5-39 Audio output connection-2



On the main menu screen, go to **Advanced Settings > Audio** to enter the audio settings screen.

Figure 5-40 Audio settings

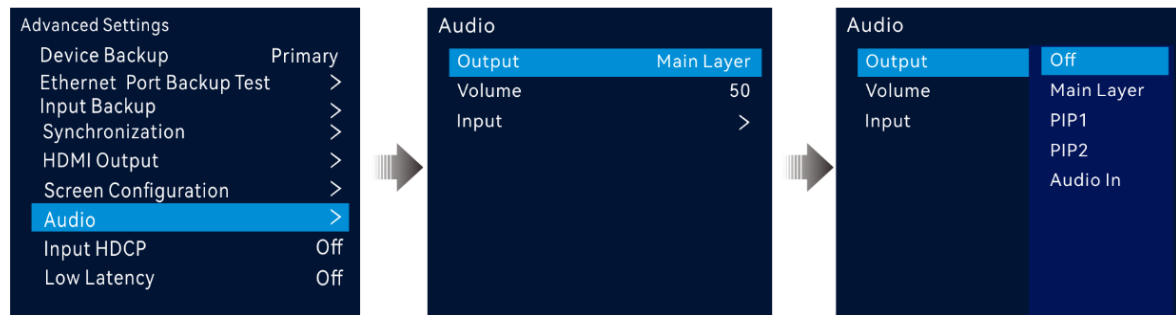


5.7.7.1 Output

Set to play which audio on the external speaker.

- Step 1 On the audio settings screen, rotate the knob to select **Output**.
- Step 2 Press the knob to open the available output list and rotate the knob to select where the output audio is from.

Figure 5-41 Audio output



- Off: Turn off the audio.
- Main Layer/PIP 1/PIP 2: Play the audio that comes with the main layer, PIP 1 or PIP 2.
- Audio In: Play the audio that comes from the audio input connector, such as microphone or audio console.

Step 3 Press the knob to complete the selection.

5.7.7.2 Volume

Adjust the audio volume.

The value ranges from 0 (silent) to 100 (loudest) and defaults to 50.

On the audio settings screen, rotate the knob to select **Volume** and press the knob to confirm. Then rotate the knob again to adjust the audio volume and press the knob to confirm.

5.7.7.3 Input

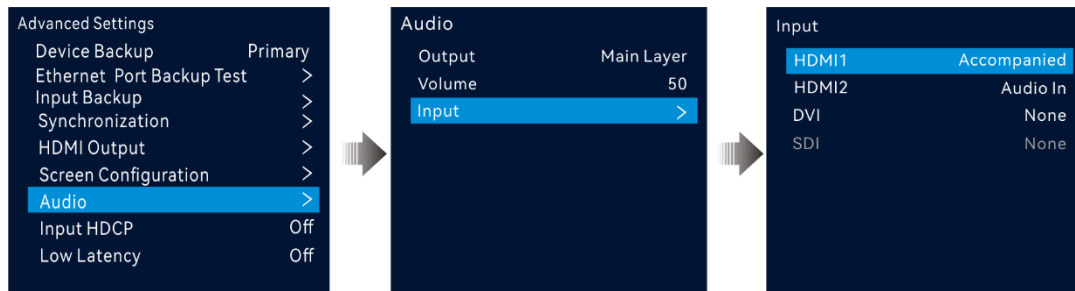
Set or change the input source audio.

- The HDMI connector comes with its own audio, and you can play the audio accompanied with the HDMI input source via the audio output connector.
- The DVI connector does not come with any audio, but you can set to play the audio from the audio input connector for the DVI input source.

Step 1 On the audio settings screen, rotate the knob to select **Input**.

Step 2 Press the knob to enter the input audio settings screen.

Figure 5-42 Input audio settings



Step 3 Rotate the knob to select the desired input source and press the knob to show the available audio input options.

- HDMI: The available options are **Accompanied** and **Audio In**.
 - Accompanied: Play the audio that comes with an HDMI input source.
 - Audio In: Play the audio from the audio output connector for the HDMI input source.
- DVI: The available options are **None** and **Audio In**.
 - None: The DVI connector does not come with any audio. When **None** is selected, no audio will be played for the DVI input source.
 - Audio In: Play the audio from the audio output connector for the DVI input source.

Step 4 Rotate the knob to select the desired audio and press the knob to confirm.

5.7.8 Input HDCP

High-bandwidth Digital Content Protection (HDCP) is a form of digital copy protection to prevent copying of digital audio and video content as it travels across connections. When the accessed input source is an HDCP-encrypted one, you need to turn on this function to enable the device to transmit and process the source.

On the main menu screen, go to **Advanced Settings > Input HDCP** and press the knob to enable the settings. Then rotate the knob again to select **On** or **Off** and press the knob to confirm the selection.

- On: Turn on the transmission and processing functions for the input source.
- Off: Turn off the transmission and processing functions for the input source.

5.7.9 Low Latency

When the input source travels from where it comes to the processing device, sending device and then the receiving card, latency exists inevitably. Turning on this function can effectively help to reduce the latency from the input to output.

The VC6 can reduce the delay from the input to receiving card to as low as 1 frame when the low latency and synchronization functions are both turned on and the data runs vertically on the screen.

On the main menu screen, go to **Advanced Settings > Low Latency** and press the knob to confirm. Then rotate the knob again to select **On** or **Off** and press the knob to confirm the selection.

Note:

Before the low latency function is enabled, make sure you have selected a receiving card that supports this function. For the related receiving card models, please visit NovaStar's official website at www.novastar.tech or contact our technical support staff to obtain.

5.8 System Settings

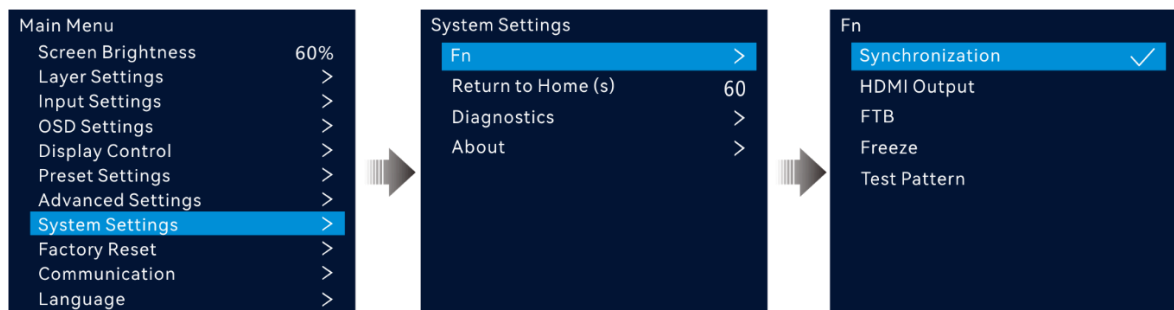
The system settings allow you to set the Fn shortcut button, return to home time, diagnose the device, and view other related information.

5.8.1 Fn

This function allows you to set a shortcut button for an assigned function. By using the Fn button, you can quickly navigate to the target menu screen and never need to access a specified menu item by entering the menus level by level.

On the main menu screen, go to **System Settings > Fn** and press the knob to enter the Fn button settings screen. Rotate the knob to select the desired function and press the knob to confirm.

Figure 5-43 Fn



5.8.2 Return to Home (s)

You can set the period when the system stays at the current screen before returning to the homepage automatically when there is no operation performed. The value ranges from 60s to 3600s.

On the main menu screen, go to **System Settings > Return to Home (s)** and press the knob to confirm. Rotate the knob to select the desired time value and press the knob to confirm.

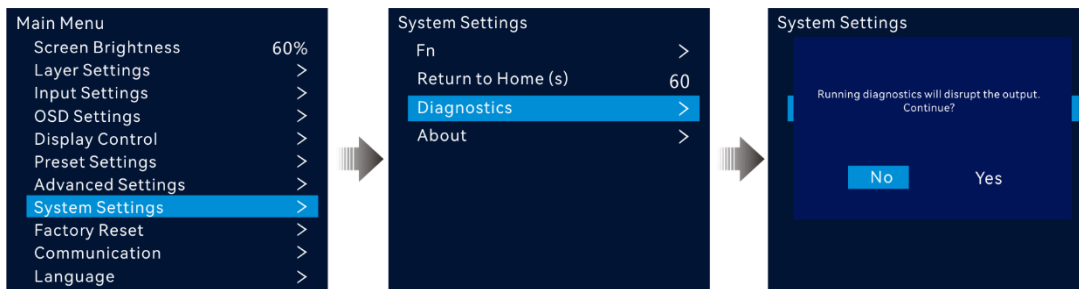
5.8.3 Diagnostics

The diagnostics function helps you to diagnose the system and troubleshoot the malfunctioned device components.

- When the device fails, you can run the diagnostics function to test the device. You can send your test to our technical support staff for problem locating and processing.
- For daily maintenance, you can run the diagnostics function to do the routine health check for the system.

On the main menu screen, go to **System Settings > Diagnostics** and press the knob to open the confirmation window. Rotate the knob to select **Yes** and press the knob to confirm.

Figure 5-44 Diagnostics



Note:

Running diagnostics will transiently disrupt the output, and the output will resume after the diagnostics are completed.

5.8.4 About

Under this menu item, you can view the firmware version, official website and email address. On our official website, you can check the latest device information and the updates for this device. You can also send your feedback or suggestion to us for improvements via the supplied email address.

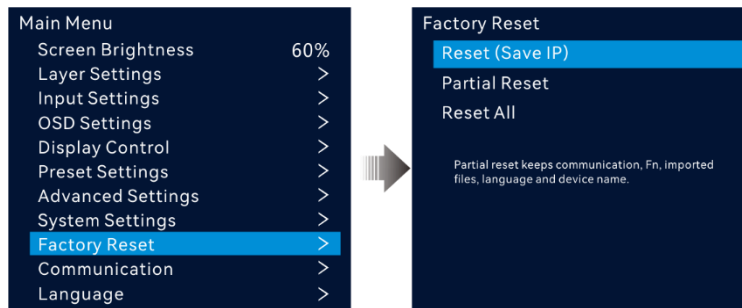
On the main menu screen, go to **System Settings > About** and press the knob to show all the information.

5.9 Factory Reset

Factory reset function allows you to reset all the parameter settings of the device to factory defaults after the device update or when you think the parameters are improperly set.

On the main menu screen, rotate the knob to select **Factory Reset** and press the knob to enter the factory reset screen.

Figure 5-45 Factory reset



- **Reset (Save IP):** Reset the parameter settings to factory defaults, except for the communication parameter settings.
- **Partial Reset:** Reset the parameter settings to factory defaults, except for the communication, Fn and language settings, imported files and device name.
- **Reset All:** Reset all the parameter settings to factory defaults.

5.10 Communication Settings

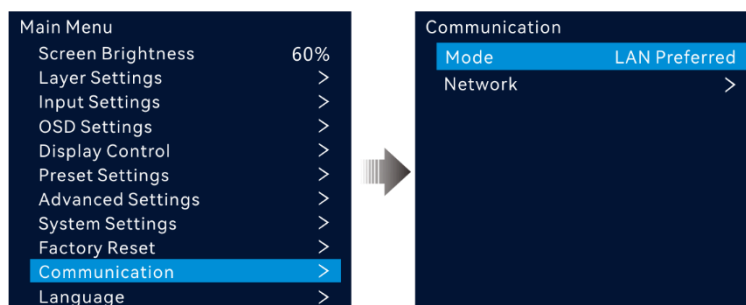
You can set the communication and network information to enable the device to communicate with the control PC smoothly.

5.10.1 Set Communication Mode

The VC6 can communicate with the control PC via either the Ethernet cable or USB cable. If the device is connected to the control PC via both the Ethernet cable and USB cable, you can select your preferred communication channel.

- Step 1 On the main menu screen, rotate the knob to select **Communication** and press the knob to enter the communication settings screen.

Figure 5-46 Communication mode



- Step 2 Rotate the knob to select **Mode** and press the knob to confirm. Rotate the knob again to select the desired mode and press it to confirm.

The options include **LAN Preferred** and **USB Preferred**.

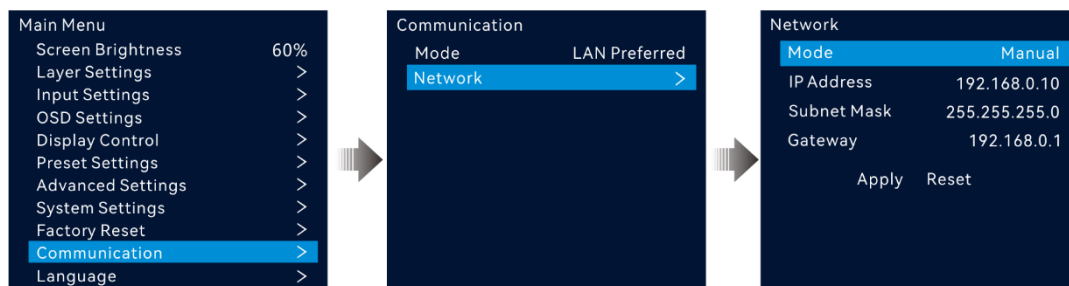
- **LAN Preferred:** The device communicates with the control PC via the Ethernet cable.
- **USB Preferred:** The device communicates with the control PC via the USB cable.

5.10.2 Set Network Parameters

When the **LAN Preferred** option is selected, you must set the device IP address, subnet mask and gateway. Ensure that the device and the control PC are on the same network segment and the device IP address must not conflict with the IP address of the control PC.

- Step 1 On the main menu screen, rotate the knob to select **Communication** and press the knob to enter the communication settings screen.
- Step 2 Rotate the knob to select **Network** and press the knob to enter the network settings screen.

Figure 5-47 Network settings



- Step 3 Select **Mode** and press the knob to confirm.

The options include **Manual** and **Automatic**.

- **Manual:** Set the device IP address, subnet mask and gateway manually.
- **Automatic:** The system automatically assigns an IP address for the device. When the device and control PC are connected to the same router or switch, set this option to **Automatic**.

- Step 4 When the **Manual** option is selected, you must manually set the device IP address, subnet mask and gateway.
- Step 5 Rotate the knob to select **Apply** to make the settings take effect; otherwise, select **Reset** to reset the settings to defaults.

5.11 Language

The language options include English, Vietnamese, Portuguese and Spanish. You can switch to your preferred language.

6 Device Update

The VC6 allows you to update the firmware in V-Can.

6.1 Obtain Firmware Update Package

Visit NovaStar's official website at www.novastar.tech, and then go to **DOWNLOADS > Processors > VC6 > Firmware**. Click **Download** to download and save the latest software package to your local hard drive.

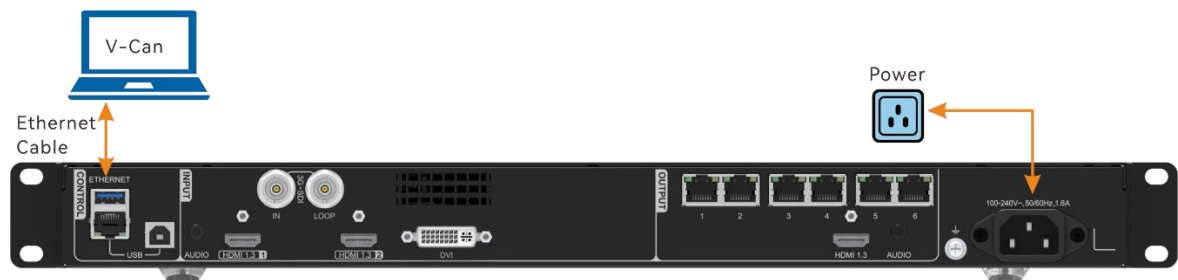
6.2 Firmware Update

Device Connection

You can update the VC6 in V-Can or in NovaLCT V5.4.2 or later.

Before the update, use an Ethernet cable to connect the device to the control PC with V-Can installed, as shown in the below figure.

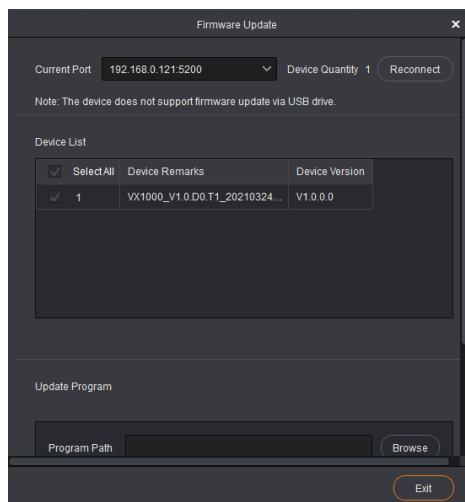
Figure 6-1 Hardware connection



Firmware Update in V-Can

- Step 1 Decompress the downloaded firmware package.
- Step 2 Start the V-Can software.
- Step 3 Go to **System > Firmware Update** to enter the update page.

Figure 6-2 Firmware update



- Step 4 Click **Browse** in the **Update Program** area to open a window where you can select the location of the downloaded firmware package with the suffix "*.img".
- Step 5 Click **OK** to add the update package.
- Step 6 Click **Update** to start the update process.
- Step 7 After the update, you can check whether the device is the latest version in the **Device List** area.
- Yes => Go to [Step 8](#).
 - No => Contact our technical support staff to find out the reason and update the device again.
- Step 8 Click **Exit** to exit the update page.

7 Specifications

Overall Specifications		
Electrical Specifications	Power connector	100–240V~, 50/60Hz, 1.6A
	Power consumption	28 W
Operating Environment	Temperature	0°C to 50°C
	Humidity	20% RH to 90% RH, non-condensing
Storage Environment	Temperature	–20°C to +70°C
	Humidity	10% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	482.6 mm × 250.0 mm × 50.1 mm
	Net weight	4 kg
	Gross weight	6.3 kg
Packing Information	Accessories	1x Power cord 1x USB cable 1x DVI cable 1x HDMI cable 1x Certificate of Approval
	Packing box	550 mm × 175 mm × 400 mm
Noise Level (typical at 25°C/77°F)		45 dB (A)

8 Video Source Features

Input Connectors	Bit Depth		Max. Input Resolution
- HDMI 1.3 - DVI (HDMI 1.3)	8bit	RGB4:4:4	1920×1200@60Hz (Standard)
		YCbCr4:4:4	3840×648@60Hz (Custom)
		YCbCr4:2:2	
		YCbCr4:2:0	Not supported
3G-SDI	- Max. input resolution: 1920×1080@60Hz - DOES NOT support input resolution and bit depth settings. - Supports ST-424 (3G), ST-292 (HD) and ST-259 (SD) standard video inputs.		

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