Colorlight

X16 PRO

User Manual

Contents

Safety Information

To avoid personal injury and equipment damage, please read and comply with the following instructions.

Power supply safety

- The power supply of this device is designed with a wide input voltage range (AC 100-240V). Please use the power cord delivered together with the device or adopt a power cord that complies with the electrical specification of the device.
- Do not put heavy objects on the power cord or the device.
- Power supply for the device must be grounded.
- The device contains live parts. To avoid electric shock, do not disassemble the device without permission.
- To avoid electric shock, do not disassemble the device while it is power-on.
- Turn off the main power supply of the device when it is used in a humid environment or when it has not been used for a long time.
- Disconnect the power supply when the device is not in use.

Operation safety

- Please use this device at altitudes of 5,000 meters or below.
- To prevent device damage, serious personal injury, or even death caused by the device falling, place the device on a stable and level surface.
- To avoid electric shock, do not operate the device with wet hands.
- Do not place or use the device near flammable materials or in an environment with explosive gas or heat sources.
- Do not spill any corrosive chemicals or liquids on or near the device.
- If the device has not been powered on for a long period of time, it must be checked and tested before use.
- Power off the device before cleaning and use dry cloth for the cleaning.
- Keep the heat dissipation hole unblocked and maintain a well-ventilated operation environment so as to ensure the heat generated during operation

can dissipate promptly, thus avoiding device damage caused by poor heat dissipation.

- It is suggested to use proper packing or maintain the original packing during transportation to avoid device damage due to strong hit by external forces.
- Be careful to prevent the device from falling while in motion to avoid personal injury or device damage.

Grounding instructions

- This product must be grounded. When equipment fails, the protective grounding contact in the power socket should be reliably connected to the protective grounding terminal in the equipment. This product is equipped with a power cord with a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.
- Improper connection of equipment grounding is able to result in a risk of electric shock. Check with a qualified electrician if you are in doubt as to whether the product is properly grounded. Do not modify the plug included with the product. If the plug is not suitable for the socket, please have a qualified electrician install a suitable socket.

Class A statement

- Warning: Using the product in a residential environment may cause radio interference.

Environmental protection

- Do not dispose of the device and its accessories as regular household wastes. Retire the device as industrial waste. Incineration is strictly prohibited.

Unpacking and inspection

- After unpacking, please check the attached packing list and see whether all parts are included. If you find any parts incomplete or missing, please contact the seller promptly.

1. Overview

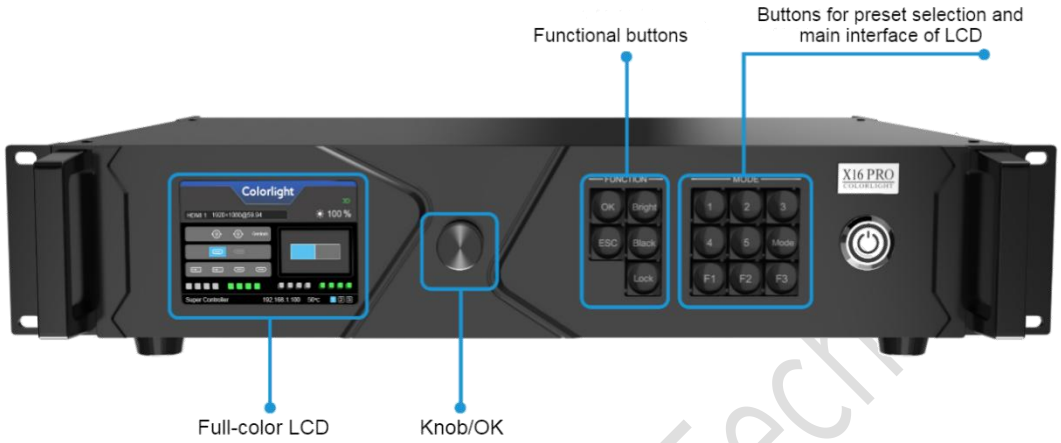
X16 PRO is a professional device for LED display control, featuring powerful capacity in receiving, splicing, and processing audio signals, with a maximum receiving capacity of 4096 × 2160 pixels for 4K digital signals. Supported by various interfaces including HDMI, DP, DVI, and SDI, the device allows for seamless switching between multiple signals. In addition, it has 16 Gigabit Ethernet ports for output, and supports display splicing, broadcast-level scaling, and up to 7-window image display. Such versatility enables flexible screen control and high-quality image display, making the device a perfect choice for high-end rental displays and fine-pitch LED displays.

Features

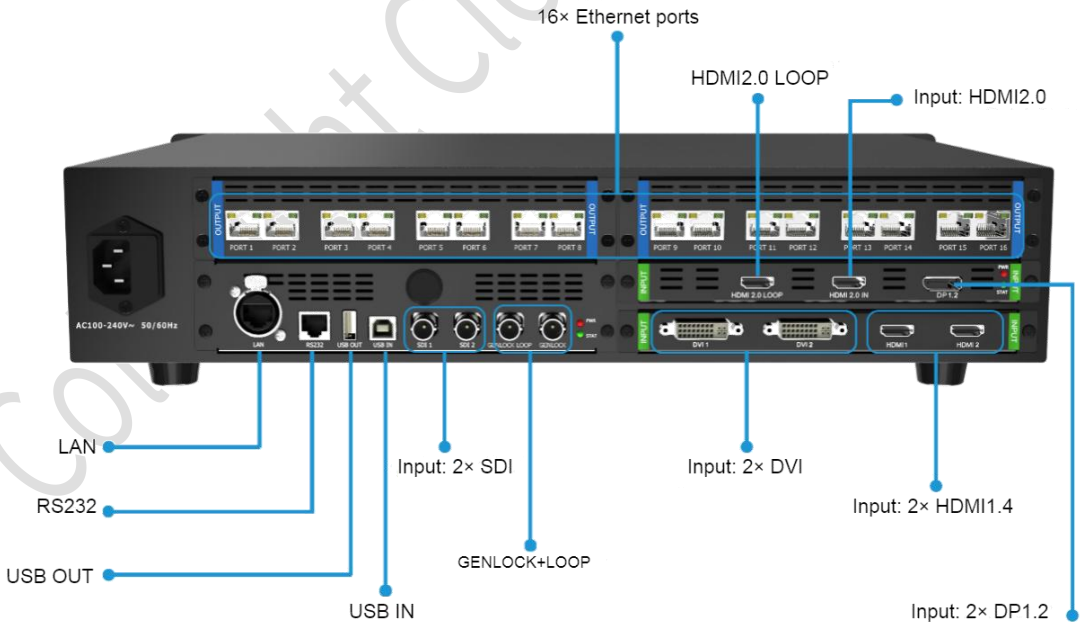
- Various interfaces for digital signals: HDMI2.0, DP1.2, SDI, and DVI;
- Customizable resolution (up to 4096×2160@60Hz);
- 16 × Gigabit Ethernet ports for output, and supports single/dual device(s) redundancy;
- Supports freely switching, cropping, splicing, and scaling audio signals;
- Up to 7-window image display, with adjustable size and position of the window;
- Supports precise color management for adjusting color gamut of the LED display;
- Optional 3D function;
- Supports Genlock for signal synchronization;
- Allows for RS232 serial port protocol control;
- Supports HDCP high-bandwidth digital content protection;
- Brightness adjustment and color temperature adjustment available;
- Supports better grayscale in low brightness, ensuring complete and perfect gray scales in low-brightness environment;
- Supports mobile app control.

2. Appearance

Front panel

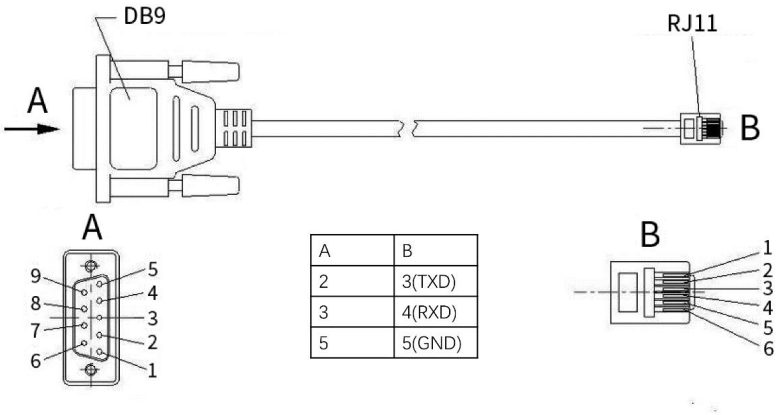


Rear Panel



Input port			
1	HDMI 2.0	1× HDMI 2.0 (supports LOOP)	Either HDMI 2.0 or DP 1.2
2	DP 1.2	1× DP 1.2	
3	DVI1, DVI2	2× DVI	
4	HDMI 1, HDMI2	2× HDMI 1.4	
5	SDI	2× 3G SDI	
Output port			
1	Port1-16	RJ45, 16× 1G Ethernet port	
Control port			
1	LAN	100M Ethernet port for controlling device through network	
2	RS232	RJ11 (6P6C)*, applicable for central control	
3	USB OUT	USB output port for cascading among X16 PRO devices	
4	USB IN	USB input port, connecting to PC for parameter debugging	
5	GENLOCK	Genlock sync signal transmission for synchronizing the screen display with the external Genlock signal	
6	GENLOCK LOOP	Loop out Genlock sync signal	
7	3D emitter connector	Connect to 3D emitter (optional)	
Power connector			
1	AC 100~240V	AC power connector with built-in fuse	

*The picture below illustrates the connection between RJ11 (6P6C) and DB9 female connector:



A	B
2	3(TXD)
3	4(RXD)
5	5(GND)

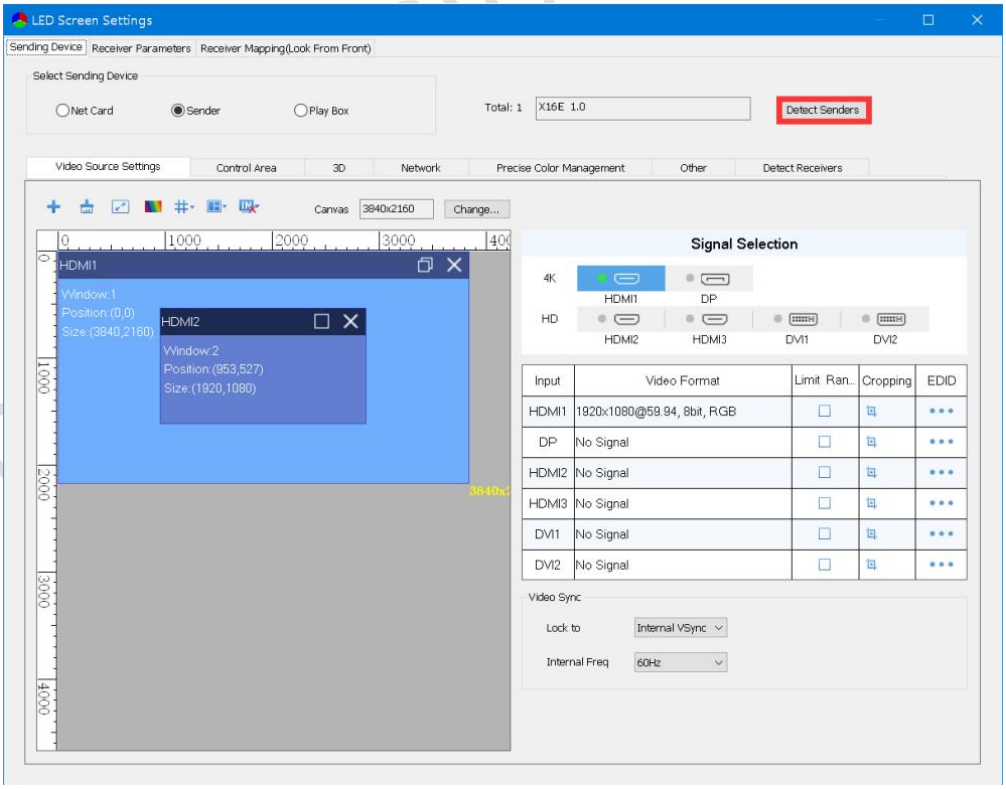
3. LEDVISION Guide

In order to use the software LEDVISION to configure parameters, you must ensure the hardware is connected properly before detecting the sender and receiving cards. You can downlow LEDVISION from Colorlight’ s official website: www.colorlightinside.com

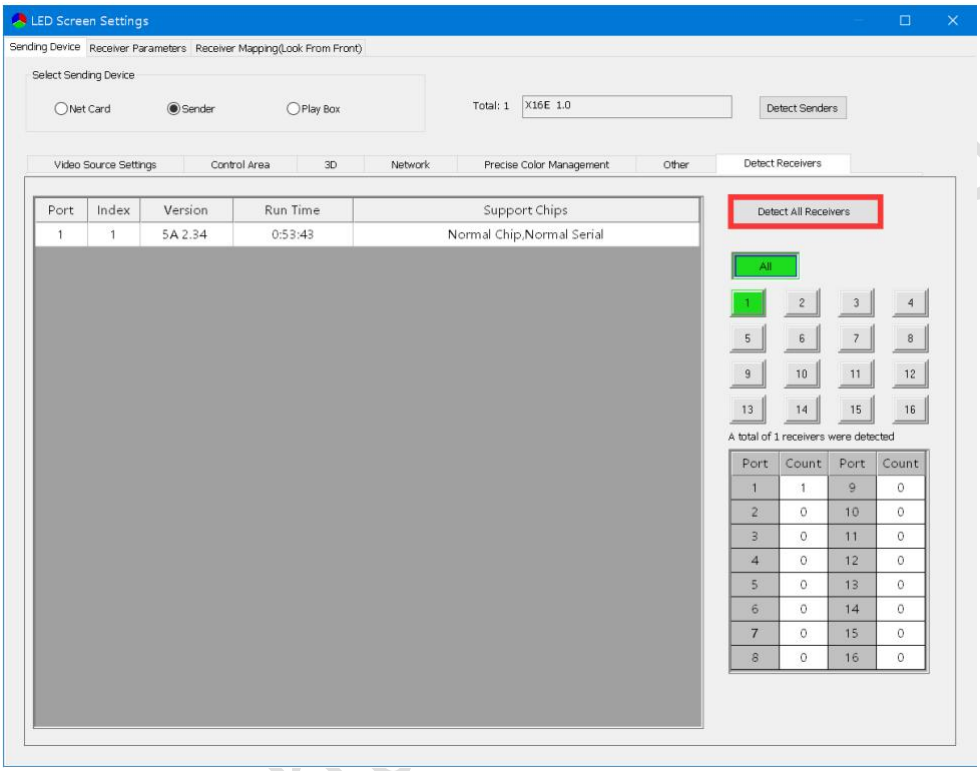
3.1 Detecting Sender and Receiver

Launch LEDVISION, and click **Control** at top of the main interface. Next, select **LED Screen Settings...** from the drop-down menu.

In the **LED Screen Settings...** window, click **Detect Senders** to view information about the sender, including its index, name, model, etc. If the signal can be input properly, you can find the tab **Signal Selection** on the right side of the window.

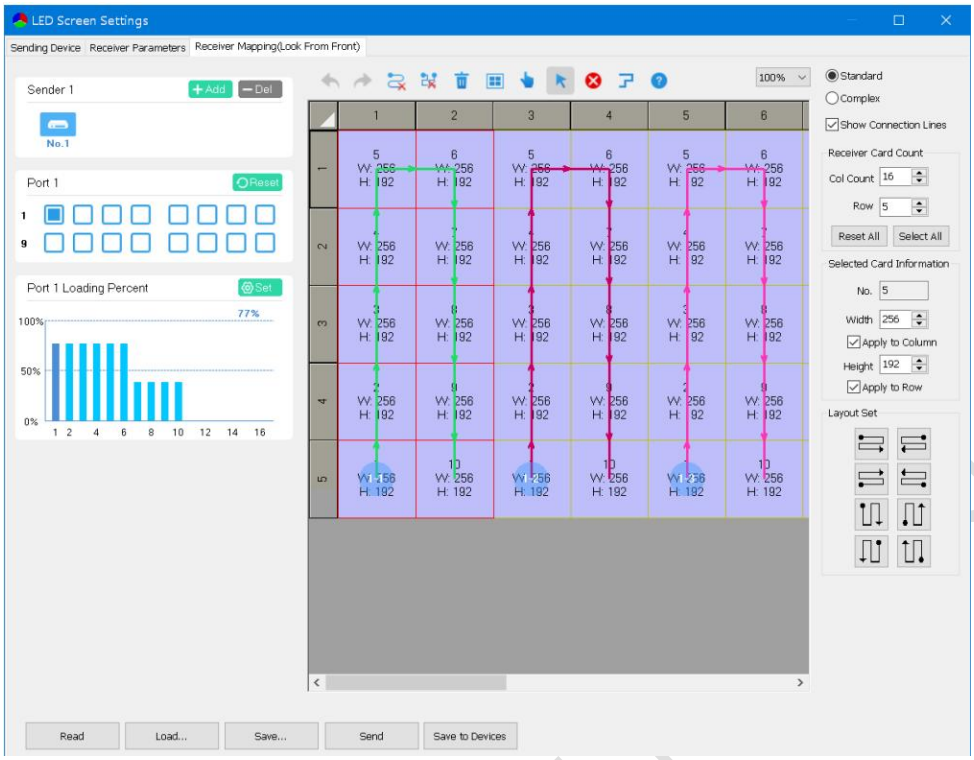


Click **Detect Receivers** in the window to view information about the receiver in a sheet. Items in the sheet include: **Port**, **Index**, **Version**, **Run Time**, and **Support Chips**. You should check the network cable connection, if the shown number of the receivers controlled by each port is inconsistent with the actual condition.



3.2 Receiver Mapping Settings

In the main interface, click **Receiver Mapping** to access the interface where you can set the mapping of the receivers.

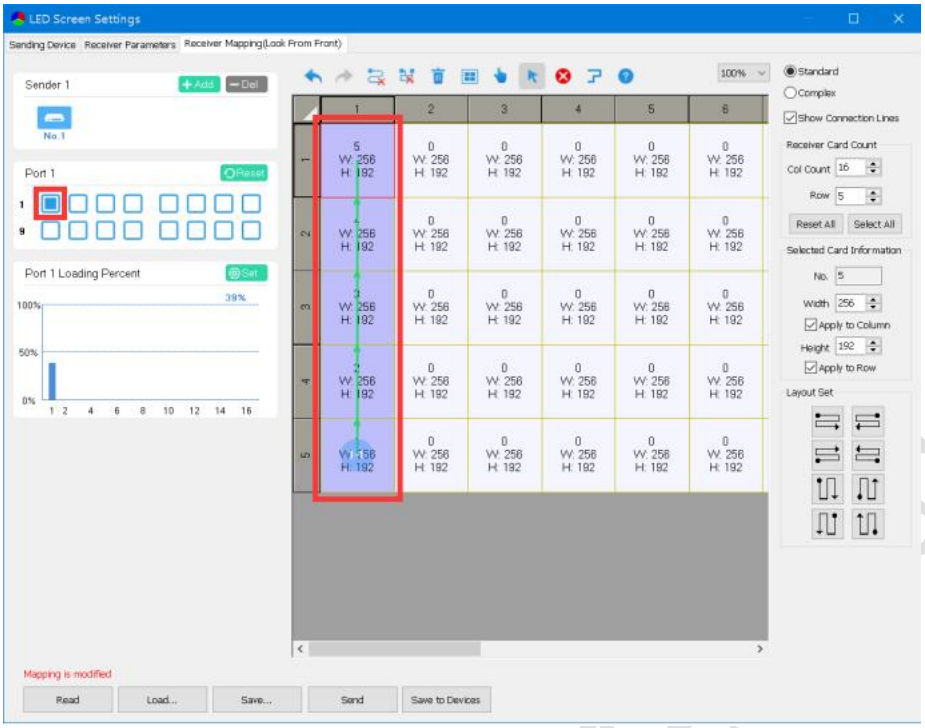


Detailed steps for setting the mapping of receivers are as follows:

3.2.1 Setting Mapping of Receivers

Select a port for setting from the left side of the interface. Then, select the cabinets controlled by that port and set their mapping correspondingly.

The area on the right side of the interface shows the cabinets of the screen, and each cabinet contains one receiver. Click the cabinet that contains the first receiver connected to the target port, then click (or click-and-hold the mouse while dragging the cursor) the rest cabinets controlled by that port one by one according to the actual order in which the cabinets are connected by the network cables.



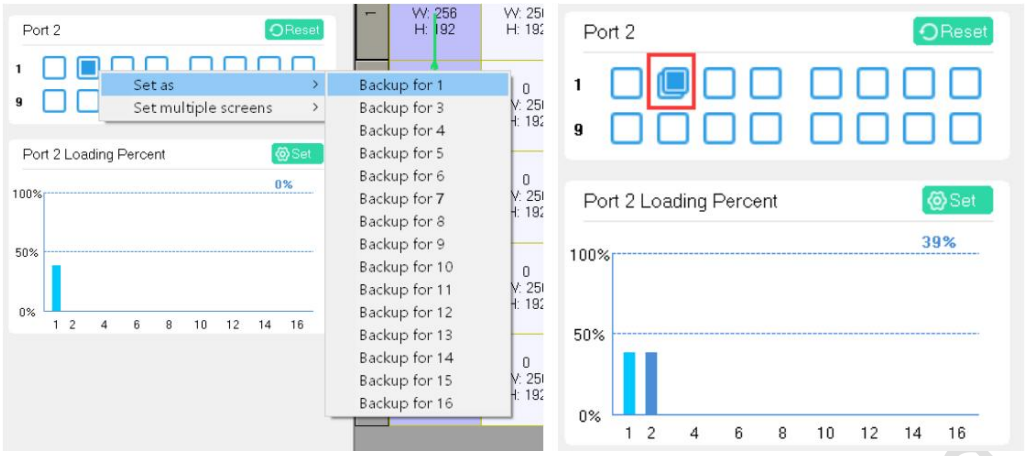
For a situation where cabinets of multiple specifications (different dimensions) exist, you can adjust the different cabinets independently after the settings.

3.2.2 Saving Mapping of Receivers

When you complete setting the receivers controlled by the ports and their mapping, click **Send** and **Save to Devices** to save the mapping to the receivers. The screen should then display image as expected.

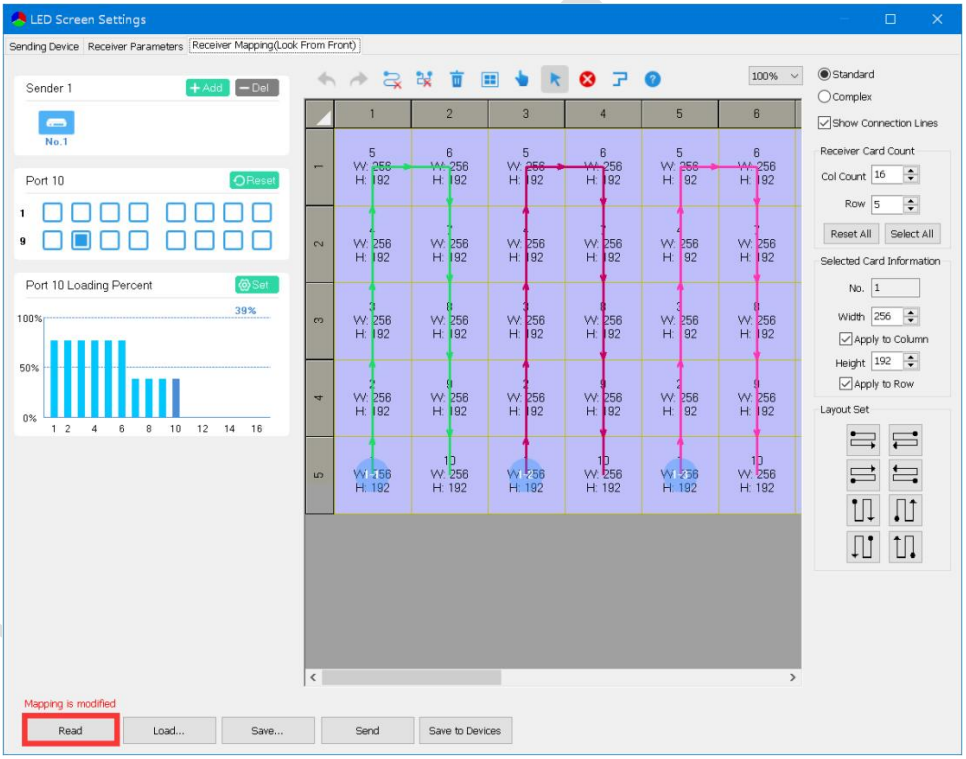
3.2.3 Setting Backup Port

On the left side of the interface, right-click the port you want to set as the backup port, select **Set as**, and then select the port to be backed up (**Backup for XX**, XX represents the index of the port to be backed up). The backup port will have a backup symbol upon successful setting.



3.2.4 Read Back Mapping of Receivers

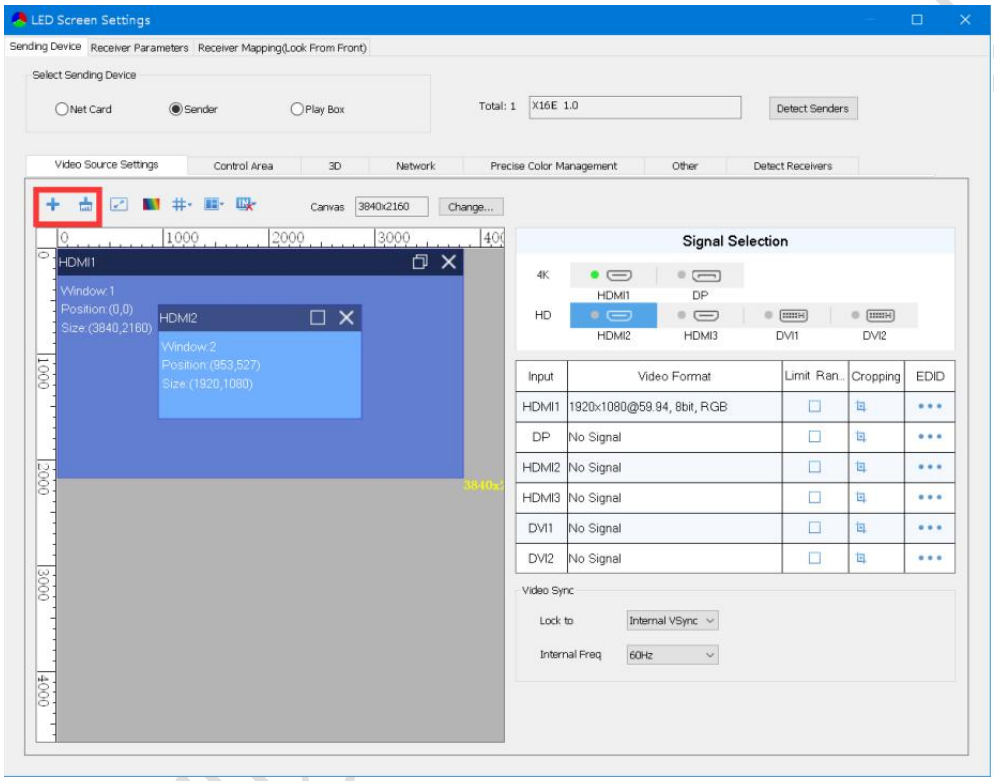
Click **Read** at the left bottom of the interface to read back the mapping of receivers saved before. LEDVISION will then apply the mapping automatically.



3.3 Video Source Settings

3.3.1 Multi-window Display

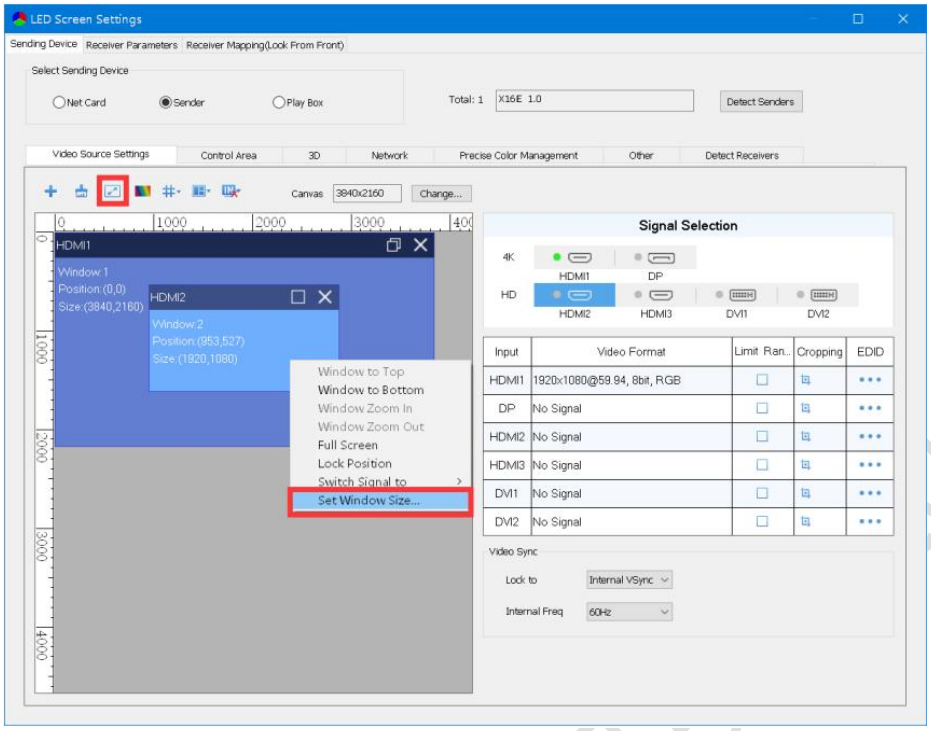
X16 PRO supports up to 7-window image display. In **Video Source Settings** tab of **Sending Device** interface, you can add or delete windows, or adjust the windows if necessary.



Click the icon  in the tab and select a new input signal to add a window. If you want to remove all windows, click the icon  .

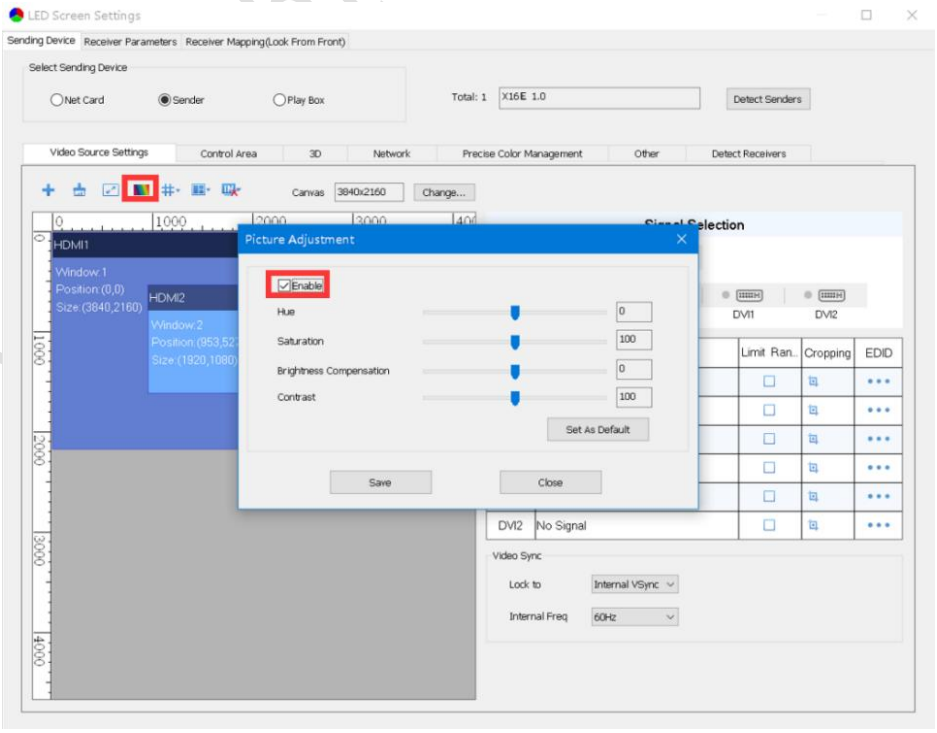
3.3.2 Window Settings

You can adjust the size of a window by selecting the window and then clicking the icon  .



3.3.3 Picture Adjustment

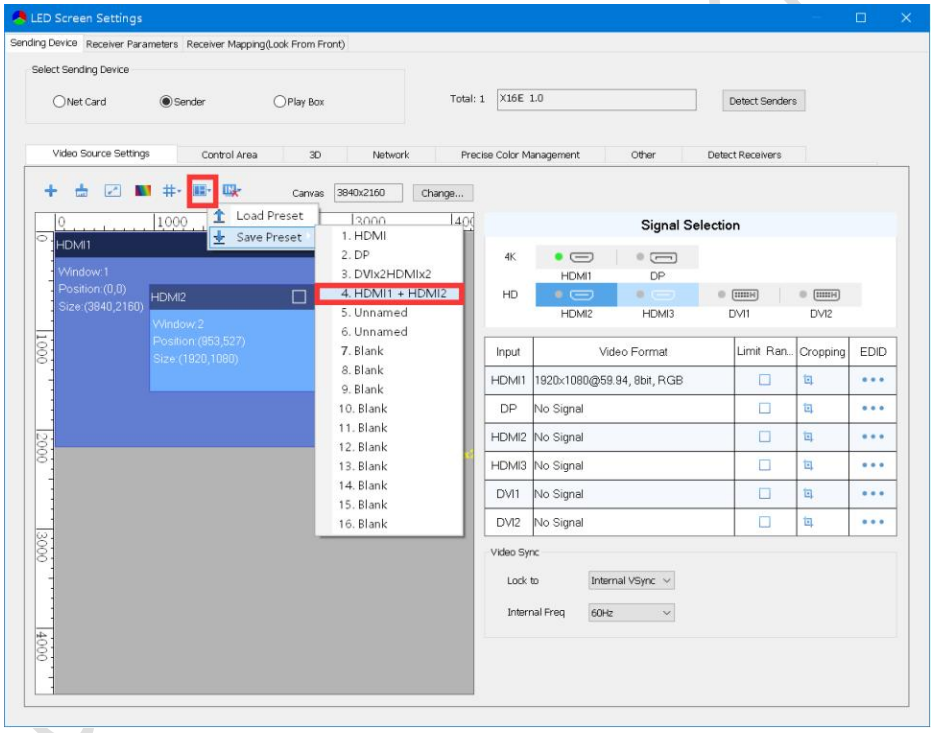
Click the icon  and then select the checkbox **Enable** to allow window image adjustment. Adjustable items include: **Hue**, **Saturation**, **Brightness Compensation**, and **Contrast**.



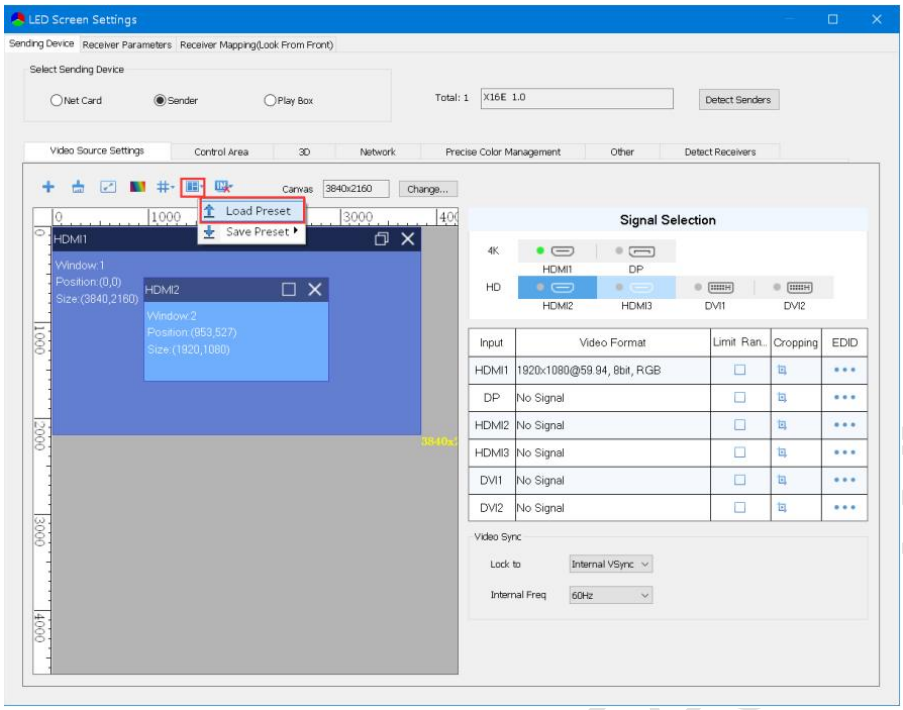
3.3.4 Preset

In **Video Source Settings** tab, you can save up to 16 preset modes. Parameters of each mode are all well set (scaling, cropping, multi-window display, EDID, etc.). With the preset modes, you can directly display any one of the preset modes without the need to set the parameters of the video source.

Click **Save Preset** after completing setting the video source parameters, then select **Blank** in the drop-right menu to name the preset. Next, click **OK** to save the preset to the sender.

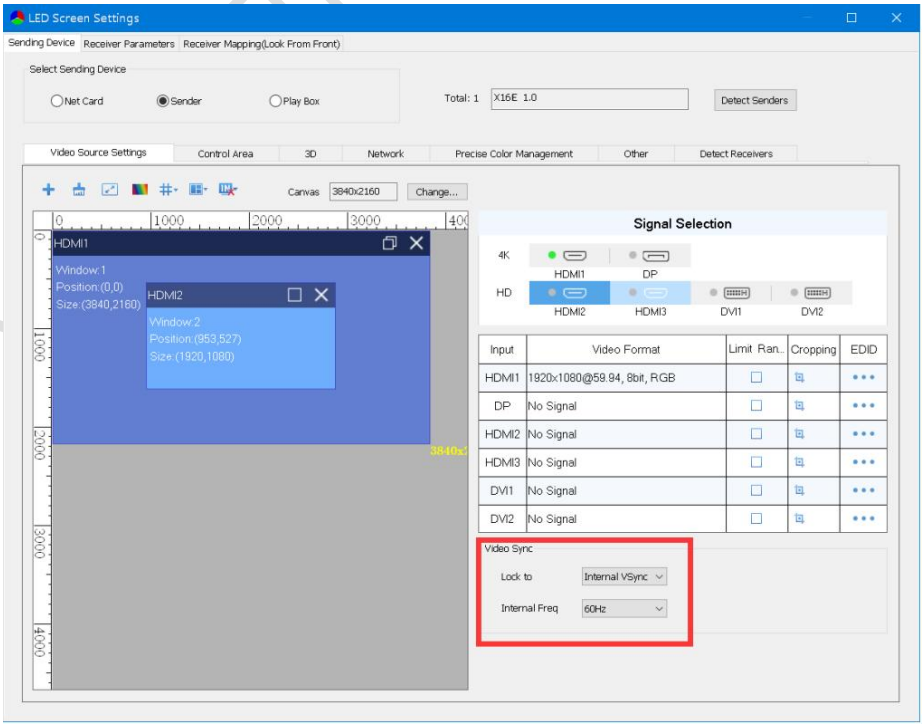


Click **Load Preset** to send a saved preset to the receiver. The window will then display as set.



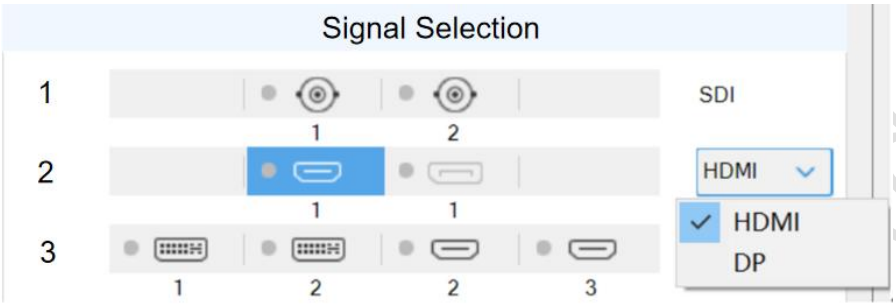
3.3.5 Video Sync

X16 PRO supports Genlock input. You can set the Genlock signal or any input signal as the sync signal. If no signal has been designated as the sync signal source, or if the designated signal source has no signal input, the main image will serve as the sync signal source.



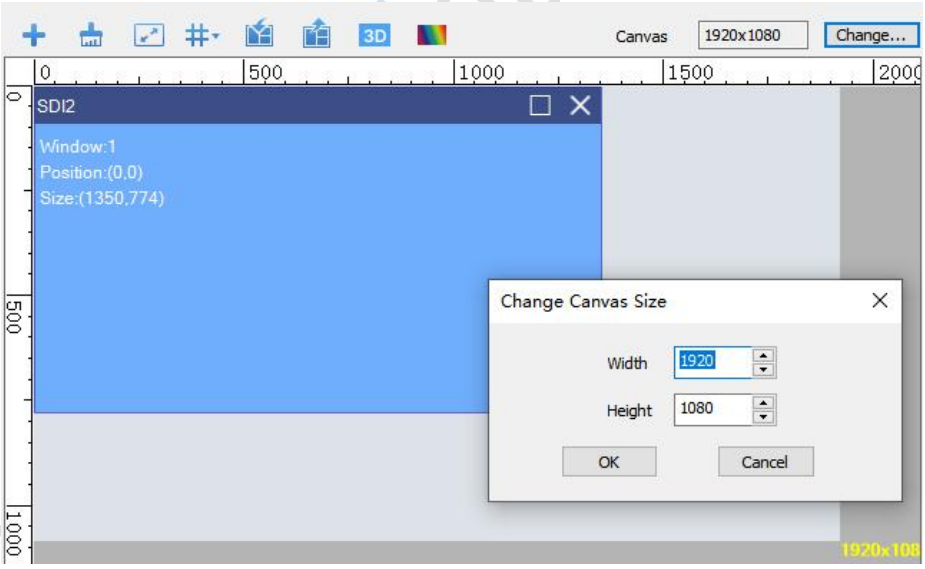
3.3.6 Switching to HDMI/DP Signal

If you want to switch signal to HDMI or DP for a window, select the window and then in the **Signal Selection** area, click the corresponding signal and make the selection from a drop-down menu.



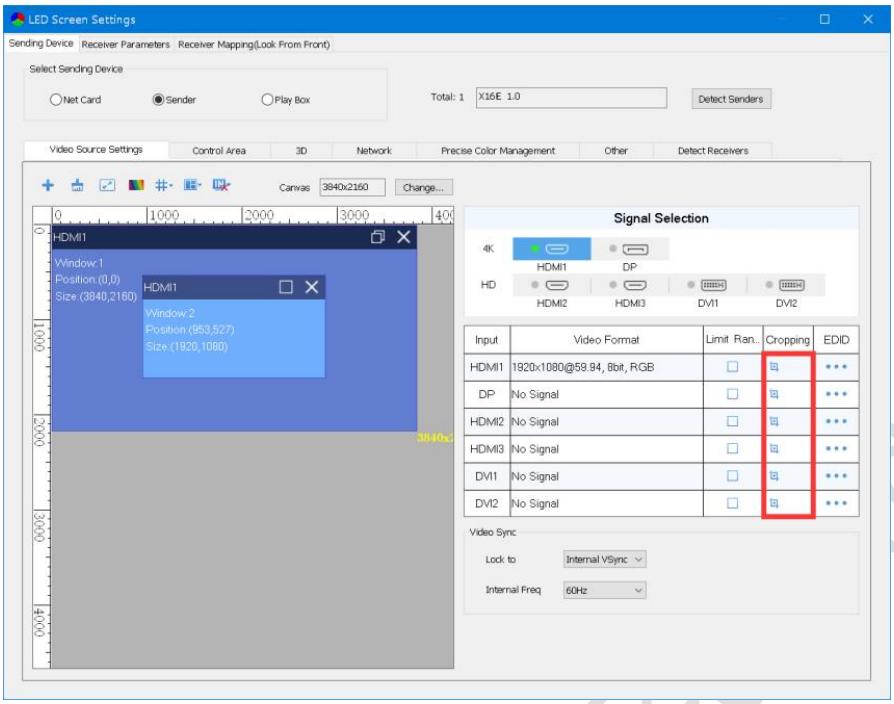
3.3.7 Scaling

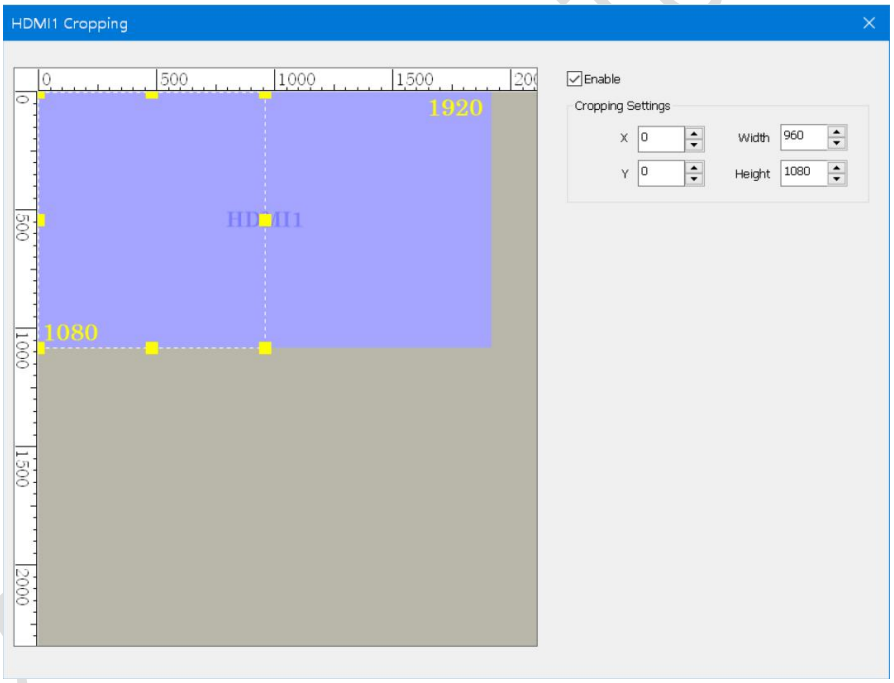
If you want to resize the canvas, click **Change...** above the canvas area, and enter the desired size in the pop-up dialogue window **Change Canvas Size**.



3.3.8 Cropping

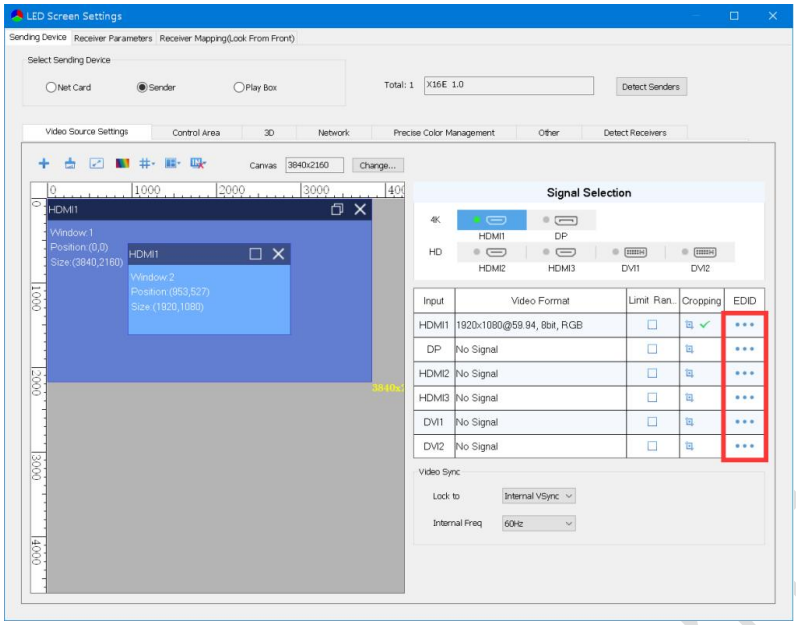
On the right side of the **Video Source Settings** tab, click the icon to bring up a pop-up window for cropping setting. In the **Cropping** window, you can set the size and position of the cropping (**X**, **Y**, **Width**, and **Height**).



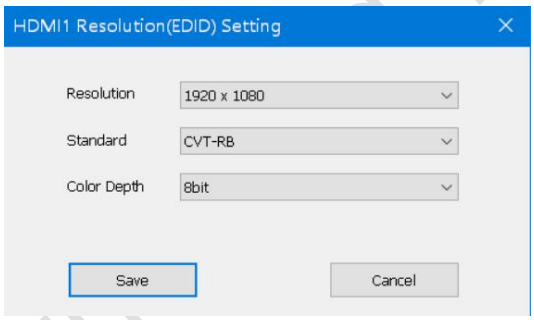


3.3.9 EDID (Resolution)

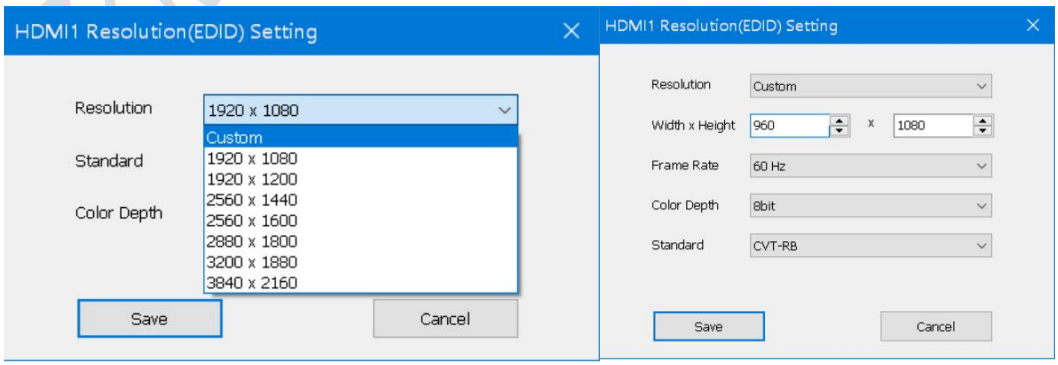
On the right side of the **Video Source Settings** tab, click the icon ••• on the row of a target signal to bring up a pop-up window for setting the signal’s resolution.



In the pop-up window, the current resolution of the sender is shown by default.



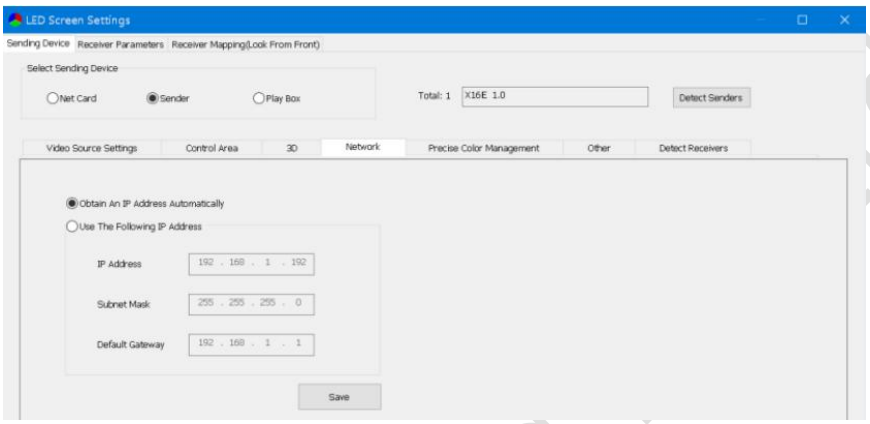
Click the downward arrow at the right side of **Resolution** field to bring up the drop-down menu of available resolution options. You can also customize the resolution by selecting **Custom** in the menu.



Click **Save** when you complete the settings.

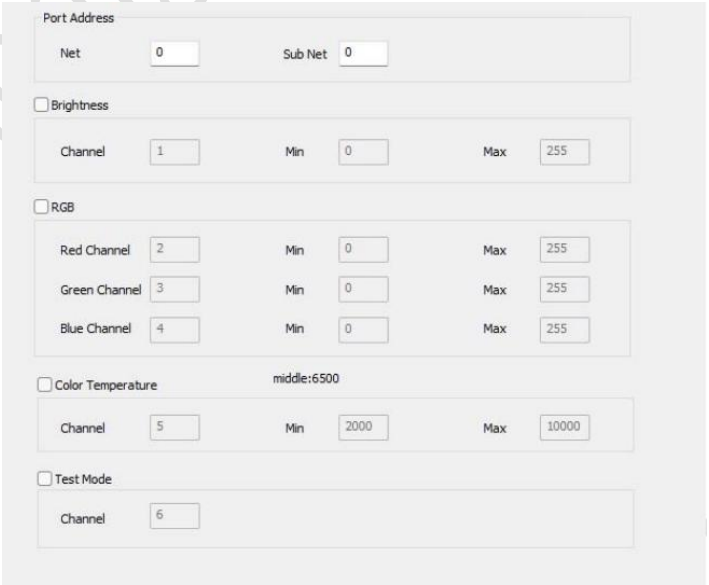
3.4 Network

In the main interface of the software, select **Network** to enter corresponding tab. You can then select **Use the following IP Address** to set an IP address for the sender. Or, you can select **Obtain an IP Address Automatically** for an assigned IP. Click **Save** when you finish the settings.



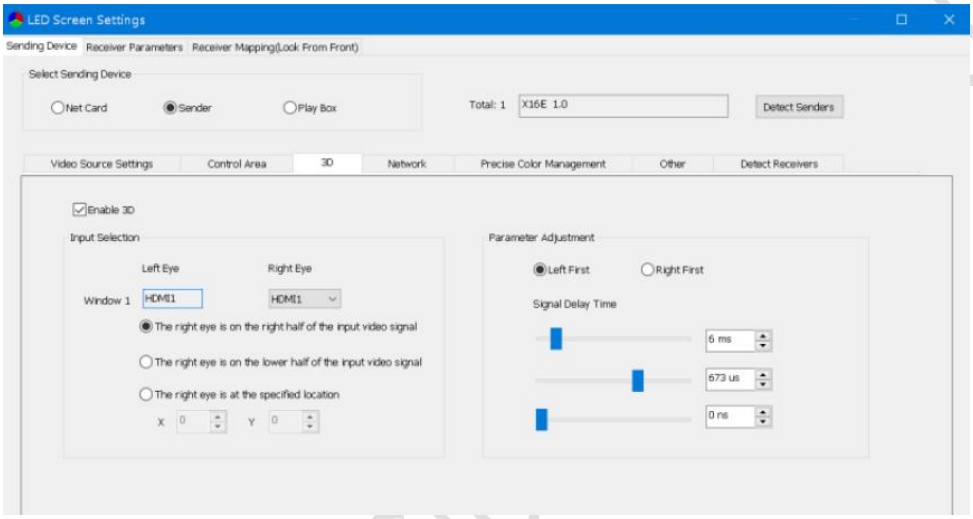
3.5 Art-Net

Art-Net is for LED display control via Ethernet-based data distribution protocol. You can access this tab after detecting X16 PRO successfully. In the tab, you can finish the settings for **Port Address**, **Brightness**, **RGB**, **Color Temperature**, and **Test Mode**.



3.6 3D

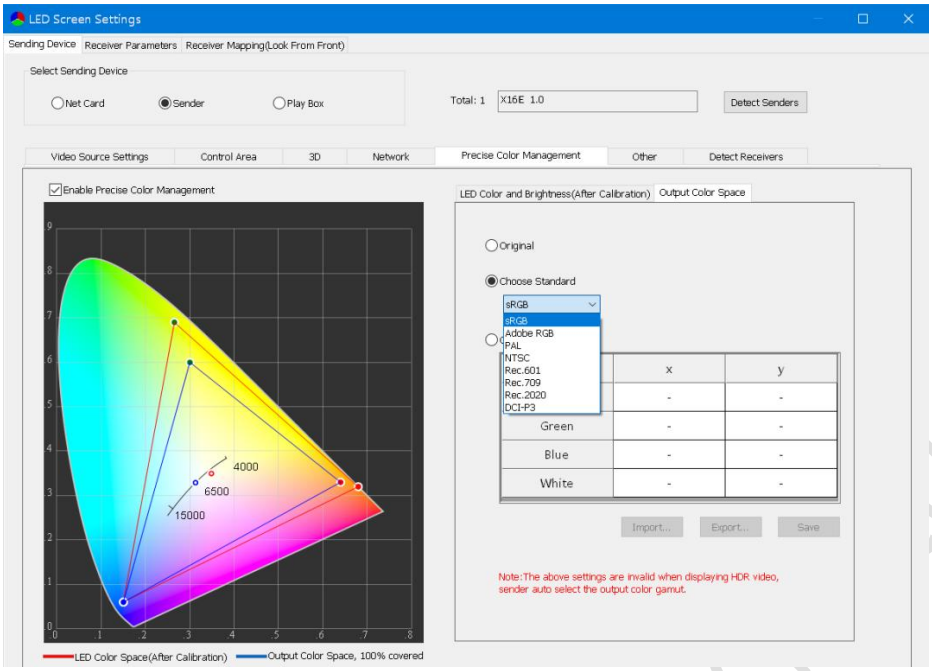
X16 PRO supports 3D display on an LED screen. In **Sending Device** window, select **3D** to access the tab. You can then complete the necessary settings for enabling 3D display. Select **Enable 3D** first. Then, select the same window's signal for the **Left Eye** and **Right Eye**. Next, configure the parameters in **Parameter Adjustment** area for a desired display effect.



3.7 Precise Color Management

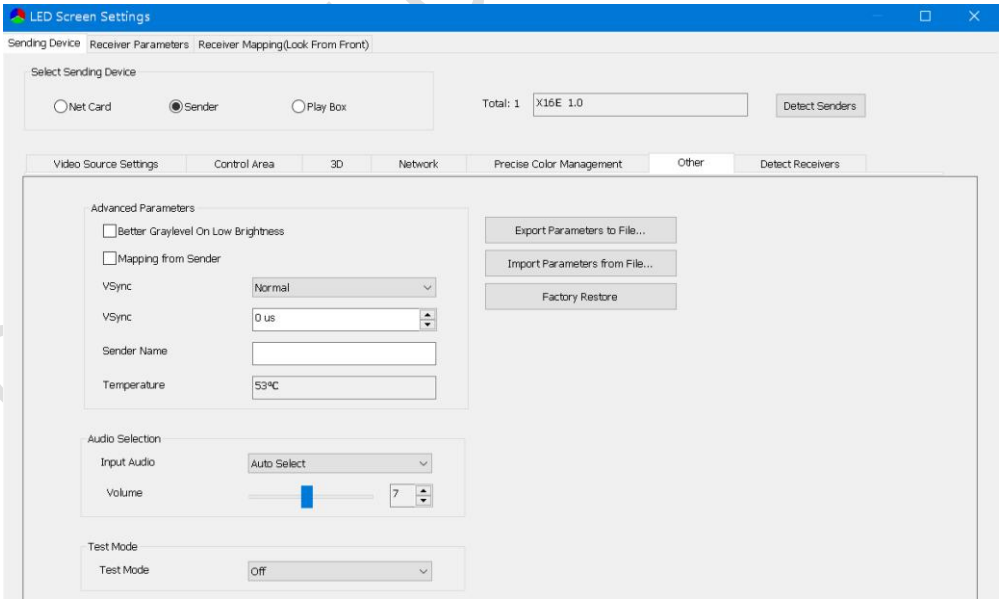
In pair with LEDVISION software, X16 PRO supports precisely managing and adjusting color displayed on LED screen.

In **Sending Device** window, select **Precise Color Management** to access this tab, and select the checkbox **Enable Precise Color Management**. You can then adjust the color and brightness, or modify the color space of the display.



3.8 Other

In the tab **Other**, you can enable functions like **Better Gray On Low Brightness** and **Mapping from Sender**, rename the sender, enable and select a test pattern, etc.



4. Front Panel Operation

4.1 Functional Buttons

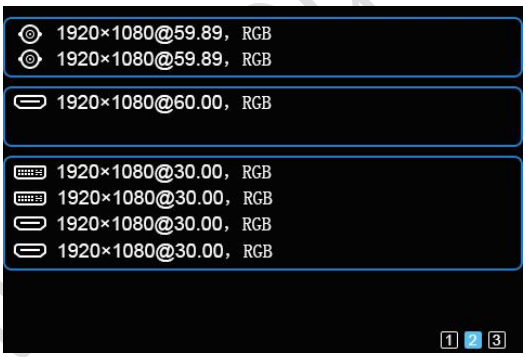
- Knob/OK
  - When the LCD in the front panel is displaying the main interface, pressing the **Knob/OK** button will bring up the operation menu.
  - In the operation menu, you can rotate the **Knob/OK** button to make selection and then press the button to confirm the selection or access corresponding sub-menu.
  - For an item with parameters, you can select the item and then rotate the **Knob/OK** button to adjust corresponding parameters. The setting will automatically be saved after 1s.

- **ESC**: Press **ESC** button to exit the current menu or operation interface.
- **Lock**: Press **Lock** button to forbid all operations on the front panel. You can undo the locking by pressing the button again and then pressing the **Knob/OK** button as guided.
- **Black**: Press **Black** button to black out LED display.
- **Bright**: Press **Bright** button and then rotate the **Knob/OK** button to adjust the brightness of the LED display. Press the **Knob/OK** button again to confirm the setting.

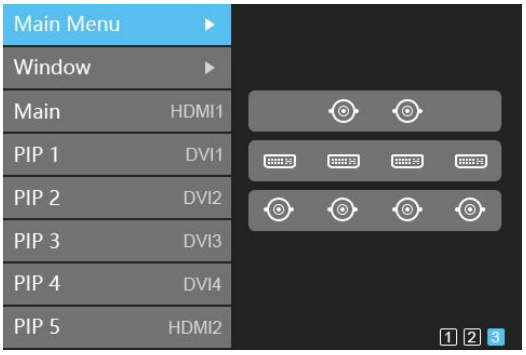
- **Mode**: In any interface of the LCD in the front panel, you can press **Mode** button to jump to the interface for fast loading of the preset parameters.

- **F1**: In any interface of the LCD in the front panel, you can jump to the main interface by pressing **F1** button.

- **F2**: In any interface of the LCD in the front panel, you can press **F2** button to jump to the interface of signal list.



- **F3**: In any interface of the LCD in the front panel, you can press **F3** button to jump to the interface for switching signals.



4.2 Splash Screen

When X16 PRO is booting up, the LCD in the front panel displays as follows:

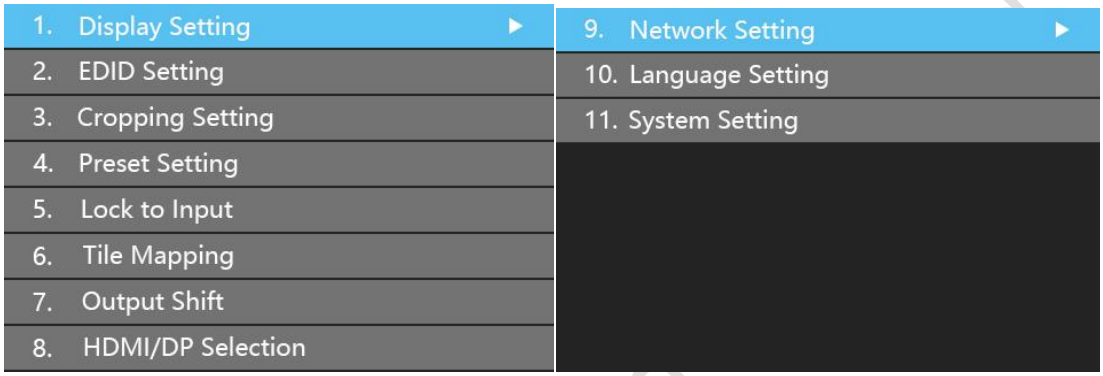
4.3 Main Interface

The main interface of the LCD in the front panel is as shown in picture below:

- The first row: Company’ s logo.
- The second row: Signal source, resolution and brightness of the main window displayed on the LED screen.
- The third row: The status of signal input and Genlock signal.
- The fourth and fifth row: Signal source input status.
- The sixth row: Input status of the Ethernet ports.
- The seventh row: Product name, local IP, running temperature, and the page number of the main interface.

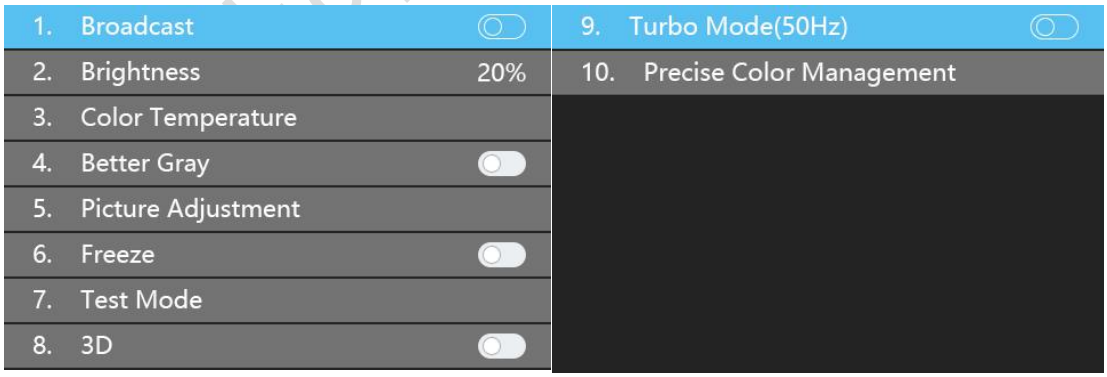
4.4 Menu

In the main interface, press the **Knob/OK** button to access the main menu of the LCD in the front panel. There are 11 available operation items: **Display Setting**, **EDID Setting**, **Cropping Setting**, **Preset Setting**, **Lock to Input**, **Tile Mapping**, **Output Shift**, **HDMI/DP Selection**, **Network Setting**, **Language Setting**, and **System Setting**.



4.4.1 Display Setting

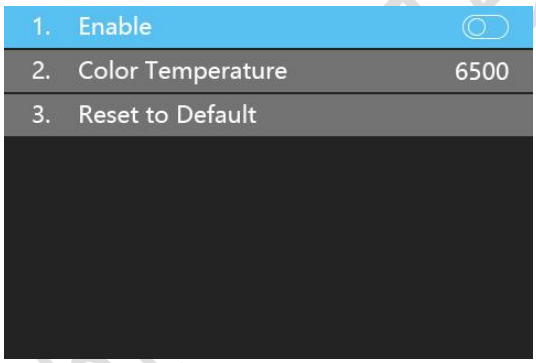
In the main interface, press the **Knob/OK** button to bring up the menu. Rotate the button to select **Display Setting**, then press the button again to access the sub-menu of **Display Setting**.



- **Broadcast**: When **Broadcast** is selected, you can rotate the **Knob/OK** button to enable or disable it. With **Broadcast** enabled when there are multiple devices cascading, you can synchronize the adjustment made in one device to other devices.

- **Brightness**: Rotate the **Knob/OK** button to select **Brightness** and press the button to confirm the selection. Then, you can rotate the button to adjust the brightness and then press the button again to save the setting.

- **Color Temperature**: In the **Color Temperature** interface, rotate **Knob/OK** button to select **Enable**, and then press the button to enable/disable the adjustment of the color temperature. Then, follow the same operation method to select **Color Temperature** and then rotate the button to adjust the value. If you want to reset the temperature to 6500, select **Reset to Default** and press the **Knob/OK** button to confirm the resetting operation.



- **Better Gray**: Select **Better Gray** and then press the **Knob/OK** button to enable/disable **Better Gray On Low Brightness**.

- **Picture Adjustment**: In the **Picture Adjustment** interface, you can rotate the **Knob/OK** button to select available items and press the button to access interface for setting corresponding item.

- **Freeze**: When **Freeze** is selected, you can press the **Knob/OK** button to enable/disable this function. With **Freeze** enabled, the LED screen will display the last frame before the **Freeze** operation.

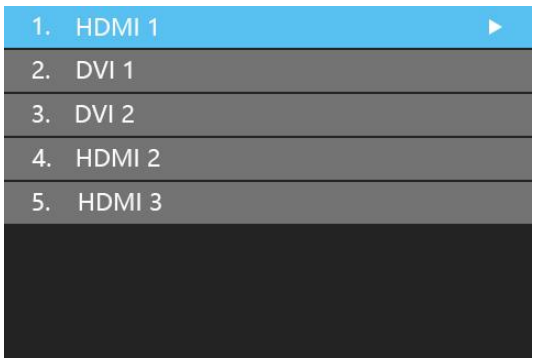
- **Test Mode**: In **Test Mode** interface, you can rotate the **Knob/OK** button to select the various test patterns.

- **3D**: When **3D** is selected, you can rotate the **Knob/OK** button to enable/disable this function.

- **Precise Color Management**: In **Precise Color Management** interface, press the **Knob/OK** button to enable/disable the function. You can also rotate and press the **Knob/OK** button to access **Color & Bright after Calibration** or **Output Color Space** for corresponding settings.

4.4.2 EDID Setting

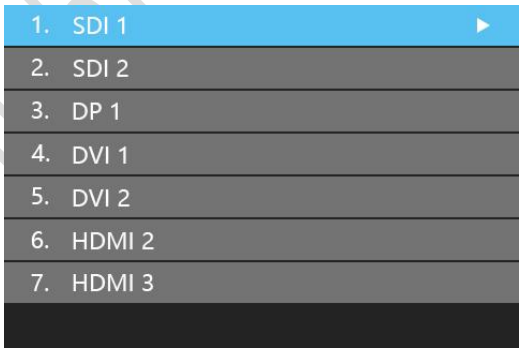
In the main menu, rotate the **Knob/OK** button to select **EDID Setting**, then press the button to access the sub-menu for the setting.



Take the setting of **HDMI 1** as an example. In the **EDID Setting** interface, select **HDMI 1** then press the **Knob/OK** button to access the setting interface. In the setting interface, you can rotate the **Knob/OK** button to select the available resolutions or customize the resolution. To set a customized resolution, you should complete setting the width, height, and frame rate of the signal, rotate the **Knob/OK** button to select **Save**, and then press the button to save the settings to the sender.

4.4.3 Cropping Setting

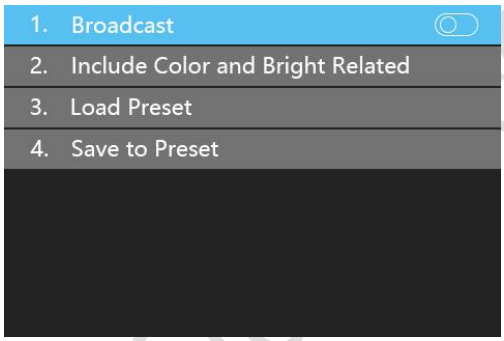
In the main menu, rotate the **Knob/OK** button to select **Cropping Setting**, and then press the button again to access the sub-menu for the setting.



In the sub-menu, you can access the setting interface for any of the signals via the **Knob/OK** button. The setting items include: coordinates of the starting point (**X** and **Y**), **Width**, and **Height**. You should save the settings when you finish.

4.4.4 Preset Setting

In the main menu, rotate the **Knob/OK** button to select **Preset Setting**, and then press the button again to access the sub-menu for the setting.

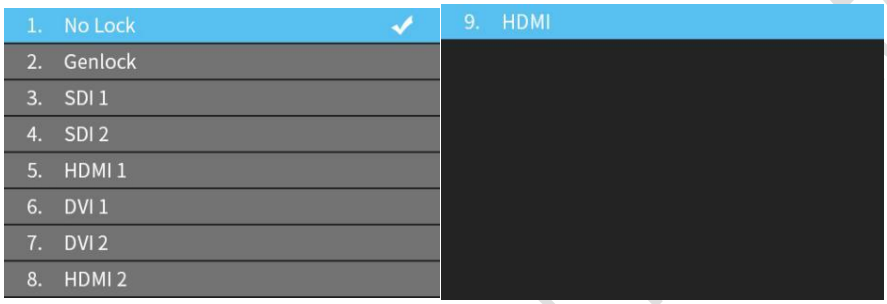


In the sub-menu, you can enable/disable **Broadcast**, and save up to 16 sets of preset, with each preset containing all parameters of the video source (scaling, cropping, multi-window display, EDID, etc.). In addition, you can also load and apply a saved preset, without the need to set the parameters one by one. Note that there are 4 sets of preset saved in the processor by default.

1. HDMI	9. Unnamed
2. HDMI/DVI 4×1 (1920*1080)	10. Unnamed
3. HDMI/DVI 1×4 (1920*1080)	11. Unnamed
4. HDMI/DVI 2×2 (1920*1080)	12. Unnamed
5. Unnamed	13. Unnamed
6. Unnamed	14. Unnamed
7. Unnamed	15. Unnamed
8. Unnamed	16. Unnamed

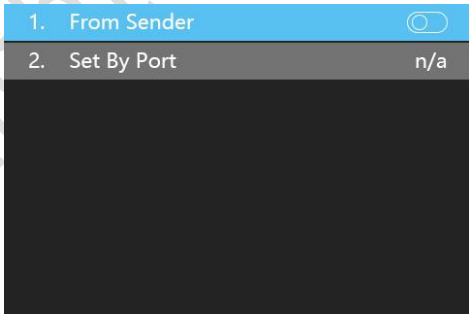
4.4.5 Lock to Input

When there are multiple devices cascading, the video signal should be synchronized in order to ensure playback synchronization. In the main menu, you can rotate the **Knob/OK** button to select **Lock to Input** and then press the button to access the sub-menu for this setting. In the sub-menu, you can select a signal as the sync signal source and press the **Knob/OK** button to confirm the selection.



4.4.6 Tile Mapping

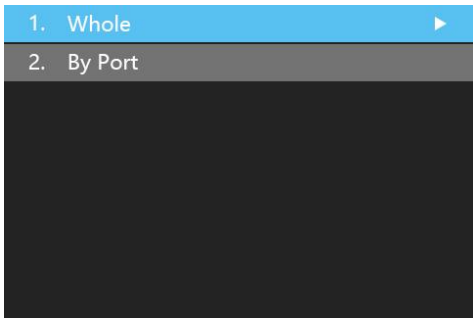
In the main menu, rotate the **Knob/OK** button to select **Tile Mapping**, and then press the button again to access the sub-menu for the setting.



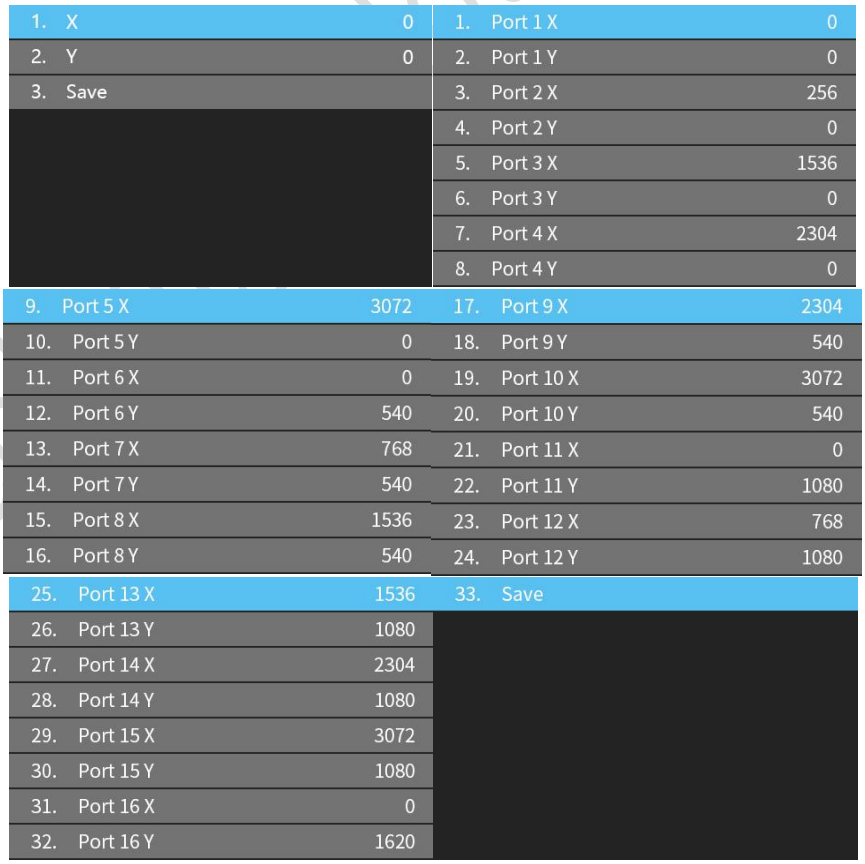
In the sub-menu, you can enable/disable **From Sender** (send the mapping parameters from sender to receiver). When **From Sender** is enabled, you can access the **Set By Port** interface to select the port (Port 1-16) for setting mapping. You can then set the offset value and determine the width, height, row count, and column count of the cabinets (tiles) controlled by the selected port. When you complete the settings, you should save the settings via the **Knob/OK** button.

4.4.7 Output Shift

In the main menu, rotate the **Knob/OK** button to select **Output Shift**, and then press the button again to access the sub-menu for the setting.



In the sub-menu, you can select **Whole** or **By Port** to control the movement of the display on LED screen. In **Whole** interface, you can set the starting point (X, Y) of the entire display image; In **By Port** interface, you can set the starting point (X, Y) of the display image for each of the 16 ports respectively. You should save the settings when you finish.

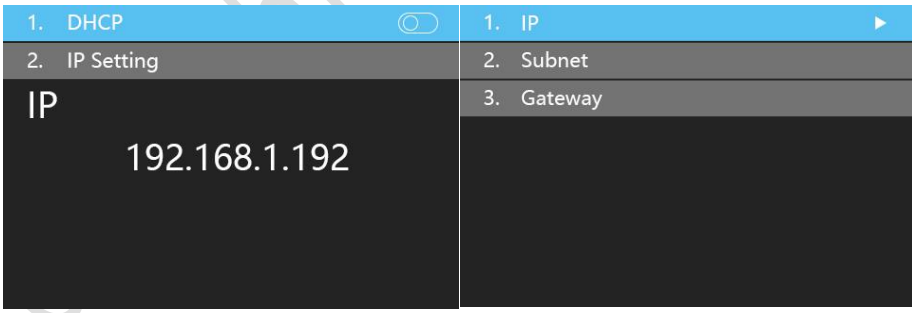


4.4.8 HDMI/DP Selection

In the main menu, rotate the **Knob/OK** button to select **HDMI/DP Board**, and then press the button again to access the sub-menu for the setting. In the sub-menu, you can select either the **HDMI** or the **DP** as the output signal.

4.4.9 Network Setting

You can access the **Network Setting** sub-menu via the **Knob/OK** button. In the sub-menu, you can enable **DHCP** to obtain an IP address, or access the **IP Setting** interface to manually set an IP address (**IP**, **Subnet**, and **Gateway**) via the **Knob/OK** button.

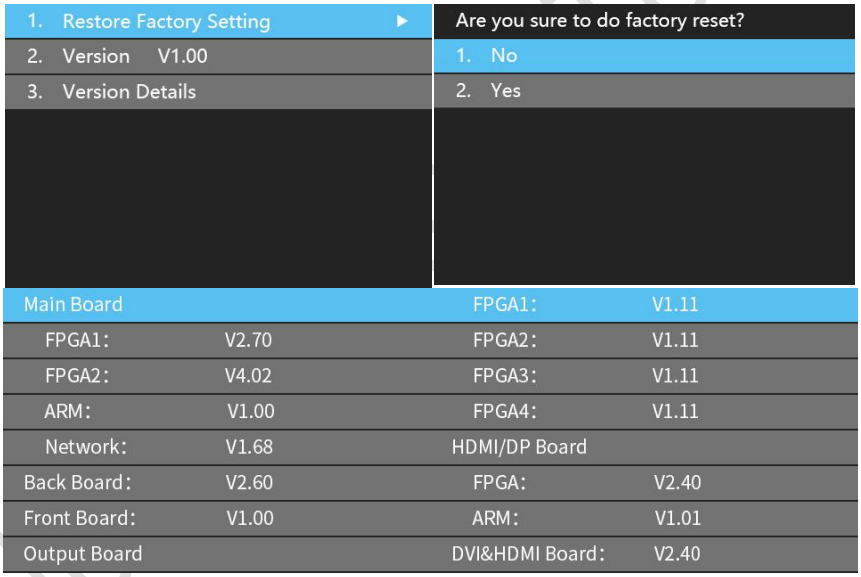


4.4.10 Language Setting

In the main menu, rotate the **Knob/OK** button to select **Language Setting**, and then press the button again to access the sub-menu for switching the LCD display language.

4.4.11 System Setting

In the main menu, rotate the **Knob/OK** button to select **System Setting**, and then press the button again to access the sub-menu for the setting. In the sub-menu, you can perform factory reset (**Restore Factory Setting**), or view the detailed information about the current version of the device.



Statement

This guide is for reference only and does not constitute any form of commitment. Please refer to the actual products (including but not limited to color, size, screen display, etc.)

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