![Colorlight logo]

Colorlight

X16 Controller

USER MANUAL

Content

1. Overview

The X16 is a professional LED display controller. It possesses powerful video signal receiving, splicing, and processing capacities, and supports multiple signal inputs in which the maximum input resolution is 4K@4096×2160 pixels. It supports multiple digital ports (HDMI, DVI, SDI), and seamless switching between signals. It also supports splicing, broadcast quality scaling, and seven-pictures displays.

The X16 adopts 16 Gigabit Ethernet outputs, and it supports large LED displays of up to 8192 pixels in maximum width/height. Meanwhile, the X16 is equipped with a series of versatile functions which can provide flexible screen control and high-quality image displays. It can be perfectly applied to high-end rental displays and high-resolution LED displays.

Features

● Supports various digital signal ports, including 1×HDMI 2.0, 4×DVI, and 2×SDI

● Supports input resolutions of up to 4096×2160@60Hz

● Loading capacity: 8.88 million, maximum width/height: 8192 pixels

● Supports arbitrary switching of video sources; the input images can be spliced and scaled according to the screen resolution

● Supports seven-pictures displays, and the location and size can be adjusted freely

● Supports HDCP 2.2

● Dual USB2.0 for high speed configuration and easy cascading among controllers

● Supports brightness and chromaticity adjustments

● Supports improved gray-scale performance at low brightness

● Compatible with all receiving cards, multifunction cards, and optical fiber transceivers of Colorlight

2. Appearance

The front panel

No.	Name	Function
1	3.5-inch LCD	Displays the operation menu and system information
2	Knob	Turn knob to select or adjust
3	Function Keys	OK: Enter key ESC: Escape current operation or selection Bright: Brightness option Black: Blank screen Lock: Lock keys
4	Selection Keys	HDMI/DVI1/DVI2/DVI3/DVI4/SDI1/SDI2: Video source selection Mode: Output mode selection of images Freeze: Freeze screen
5	Power Switch	Power switching for equipment

The back panel

Input Interface		
1	HDMI	HDMI 2.0 input, EIA/CEA-861 Standard, in accordance with HDMI 2.0 standard, supports 4096×2160@60Hz, supports HDCP
2	DVI	4 DVI inputs, VESA Standard (supports 1920×1200@60Hz), supports HDCP
3	SDI	2 SDI-3G inputs, 1920×1080P
Output Interface		
1	Port1-16	RJ45, 16 Gigabit Ethernet outputs
Controlling Interface		
1	LAN	Network control (communication with PC or access network)
2	USB IN	USB input, connecting with the PC to configure parameters
3	USB OUT	USB output, cascading with the next controller
4	Genlock	Genlock signal input ensures synchronism of display image
5	Genlock Loop	Genlock synchronous signal loop output
Power		
1	AC 100~240V	AC Power Interface

3. Signal Connection
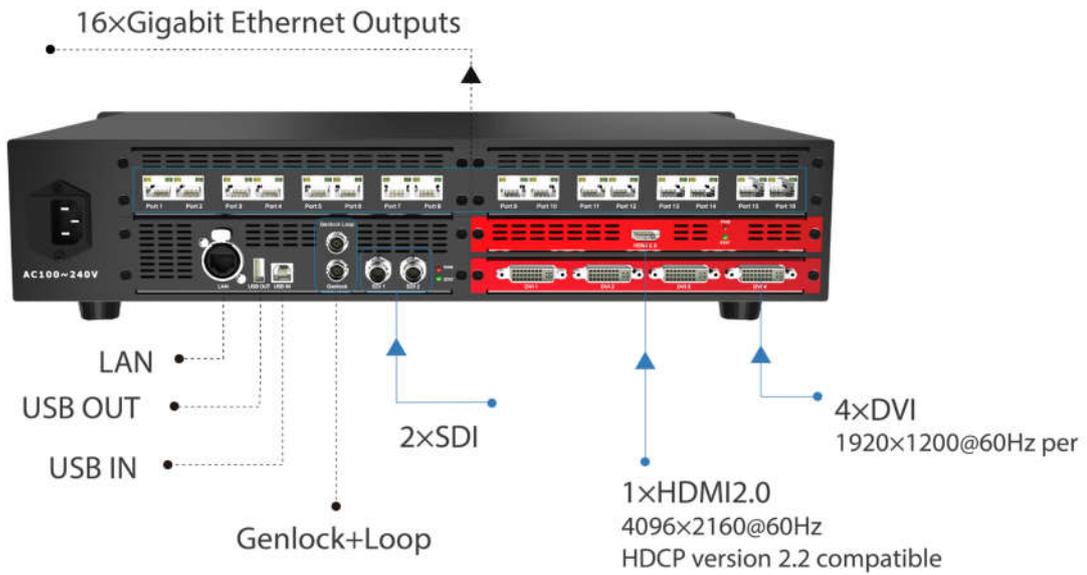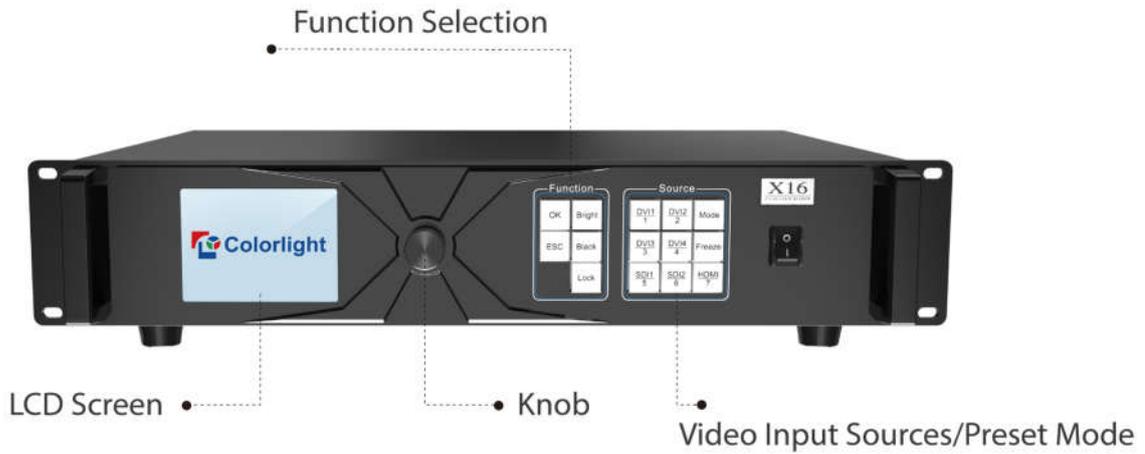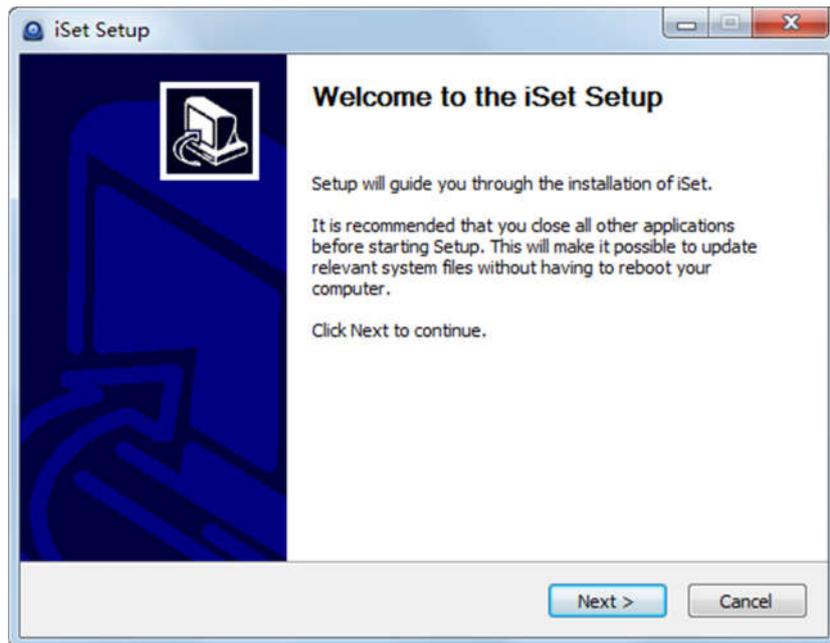
4. iSet Installation

     Please download the iSet installation package from Colorlight's official website www.colorlightinside.com. Follow the instructions and complete the software installation.

1. Run the software package, select language **[English]** and click **[OK]**.
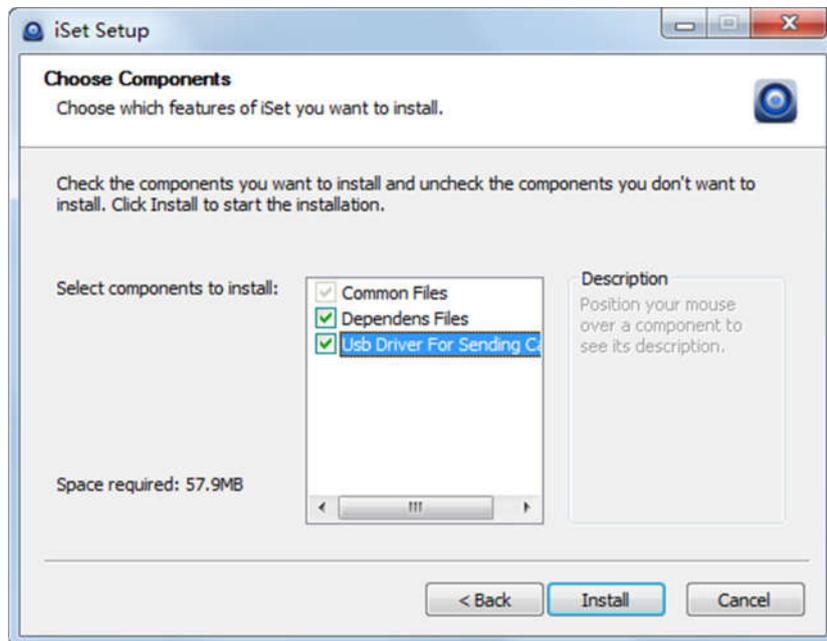
2. You will see the iSet installation guidance as below. Click **[Next]**.

3. Select the installation location, click **[Browse]** to change the default target location, then click **[Next]** after completion.
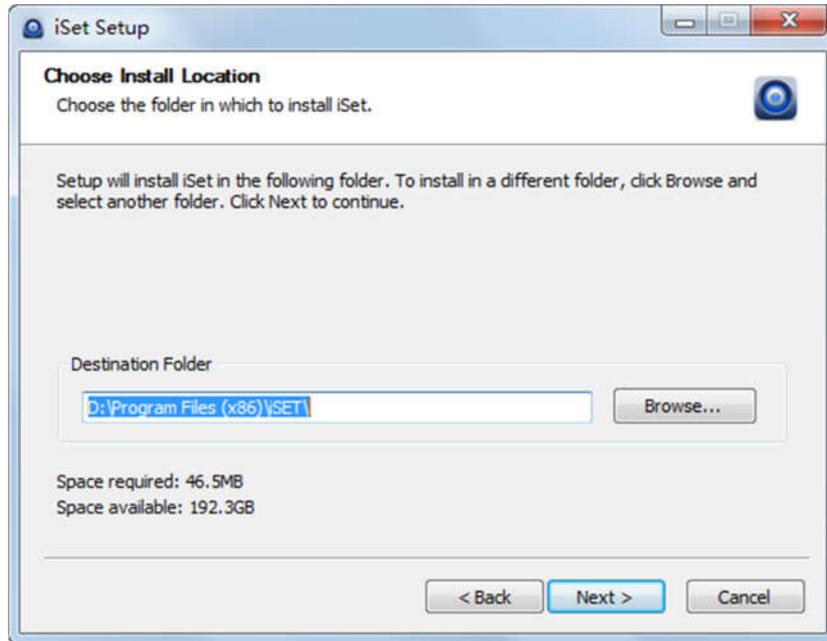
Select the components to install according to your PC status, then click **[Install]** to complete.

After the installation is complete you are ready to use iSet.

5. Parameter Configuration

Please make sure the hardware is properly connected before setup, and that all senders & receiver cards can be detected by the software.

5.1 Detect Senders and Receiver Cards

Click **[Device Information]** to enter the device information page.

1. Click **[Detect Senders]**. Index, name, type and other information of the sender will be shown in the display area. Please check your USB connection or the installation of related driver if the sender is failed to be detected.
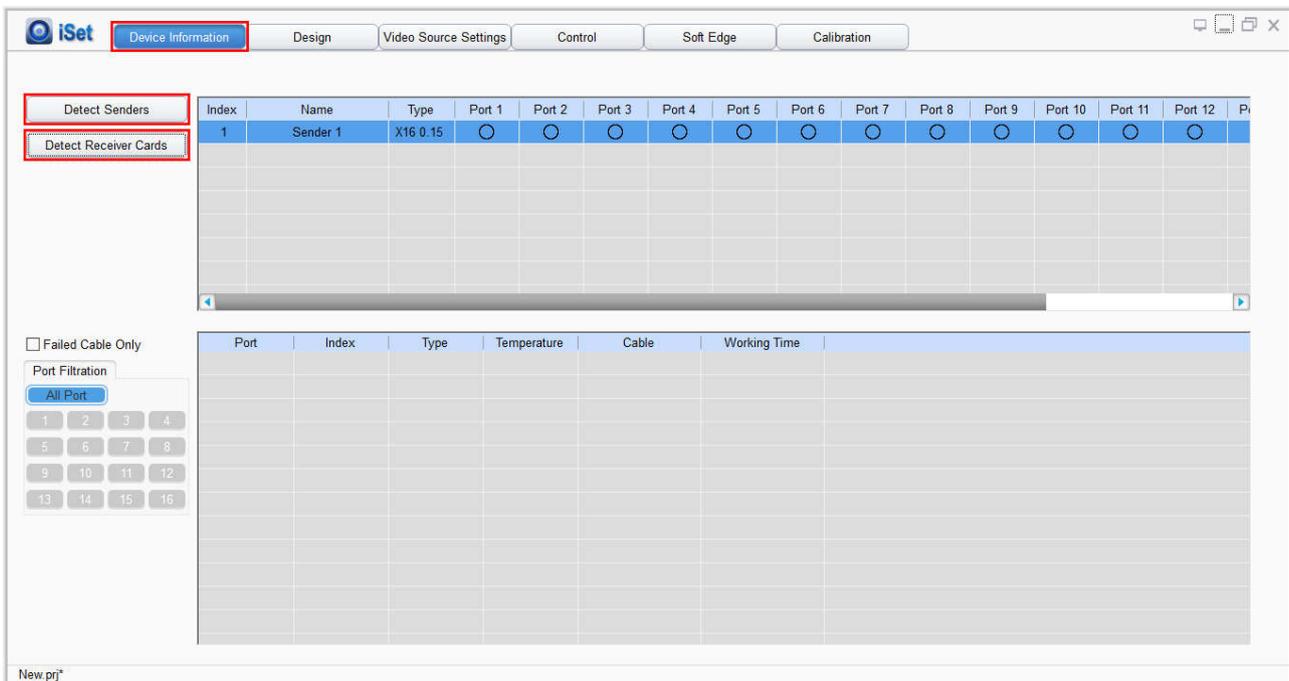
2. Click **[Detect Receiver Cards]**, the port, index, type, cable status and other information of receiver cards will be showed in the display area. Please check corresponding cable if the numbers of receiver card are inconsistent with actual status.

5.2 LED Screen Setting

The LED Screen Setting is mainly used to design the LED screen mapping. The related parameters of "**Video Source**", "**Sender**" and "**Screen Connection**" can be set separately.

5.2.1 Video Source Setting

Click **[Video Source Settings]** to enter the Video Source Setting interface. When the

signal source input of the X16 is normal, the upper right of the software interface will automatically display the input signal information obtained by the software. At this point, users can set up the related parameters of "**Video Source**" according to their own needs.
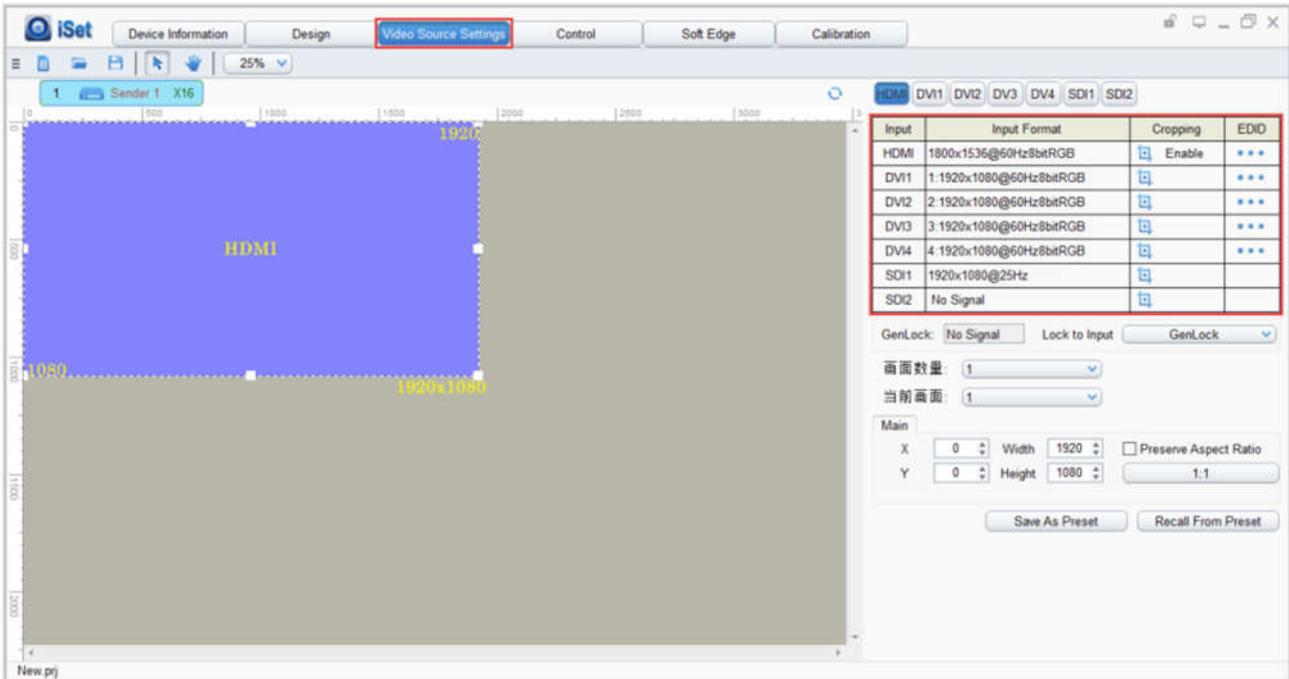
Scaling

To **select** the **image** that needs to be scaled in **Image View Area** or **[Current Layer]** on the right, set the **row starting point (X)**, **column starting point (Y)**, **width** and **height** of it, or you can click the white box in the bottom right corner of the image and draw it with the mouse. After this the scaling is completed.
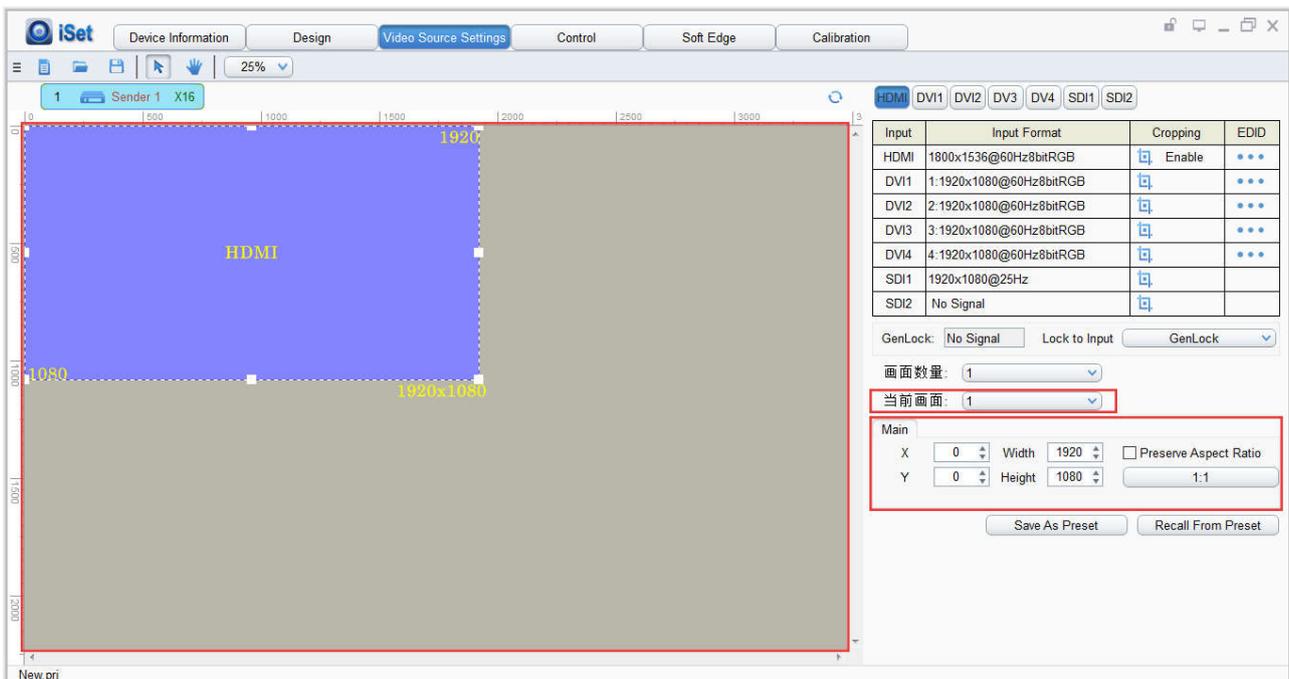
Cropping

Select the signal source of the image that needs to be cropped in **Input Signal Area**, then click " ⬚ " to enter the cropping interface.
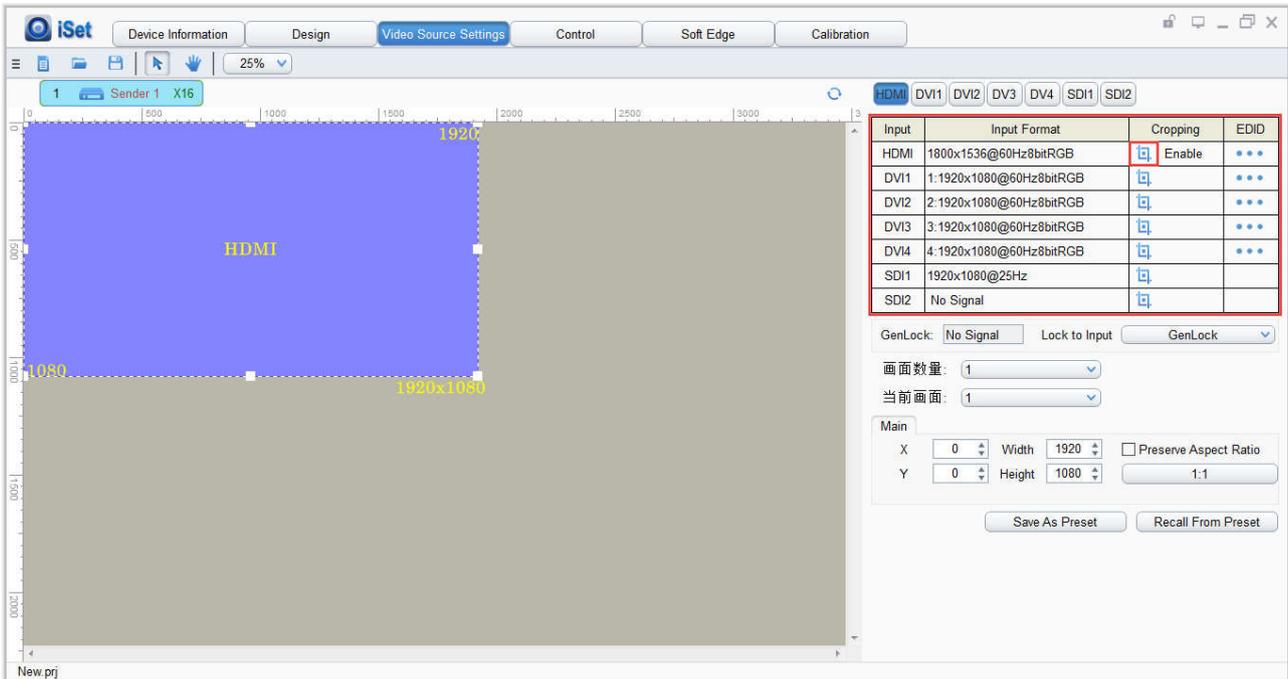
In the cropping interface, check out **[Crop]**, set the **row starting point (X)**, **column starting point (Y)**, **width (W)** and **height (H)** in **[Cropping Information]**, then the cropping will be completed.
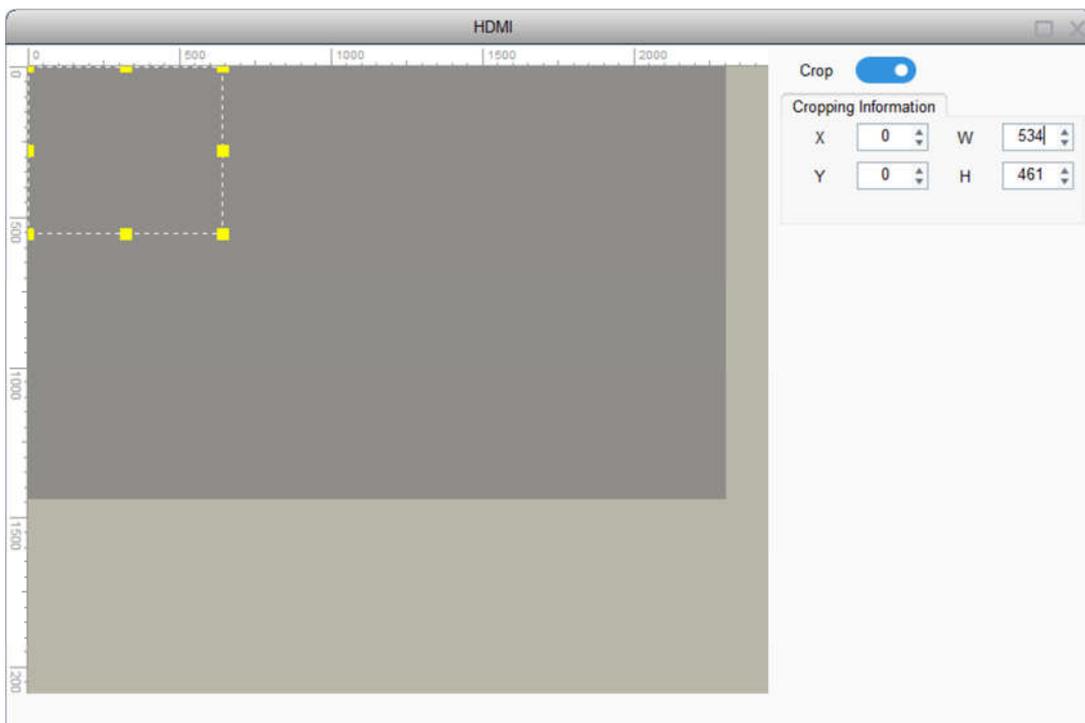
Seven Layers Displays

The X16 supports seven layers displays so that users can select 1-7 (the number of layers) based on the demand in **[Number of Layer]**, then you can complete the **Screen Setup Wizard**.

Take 2 (number of layers) as the example, select **[Number of Layer]** for 2, and the screen setup wizard will pop up. Select the input signal source of screen 1 in **[Video Input]**, scale the screen 1 in **[Screen Settings]**, click " " to crop the screen 1, then click **[Next]** after completing.
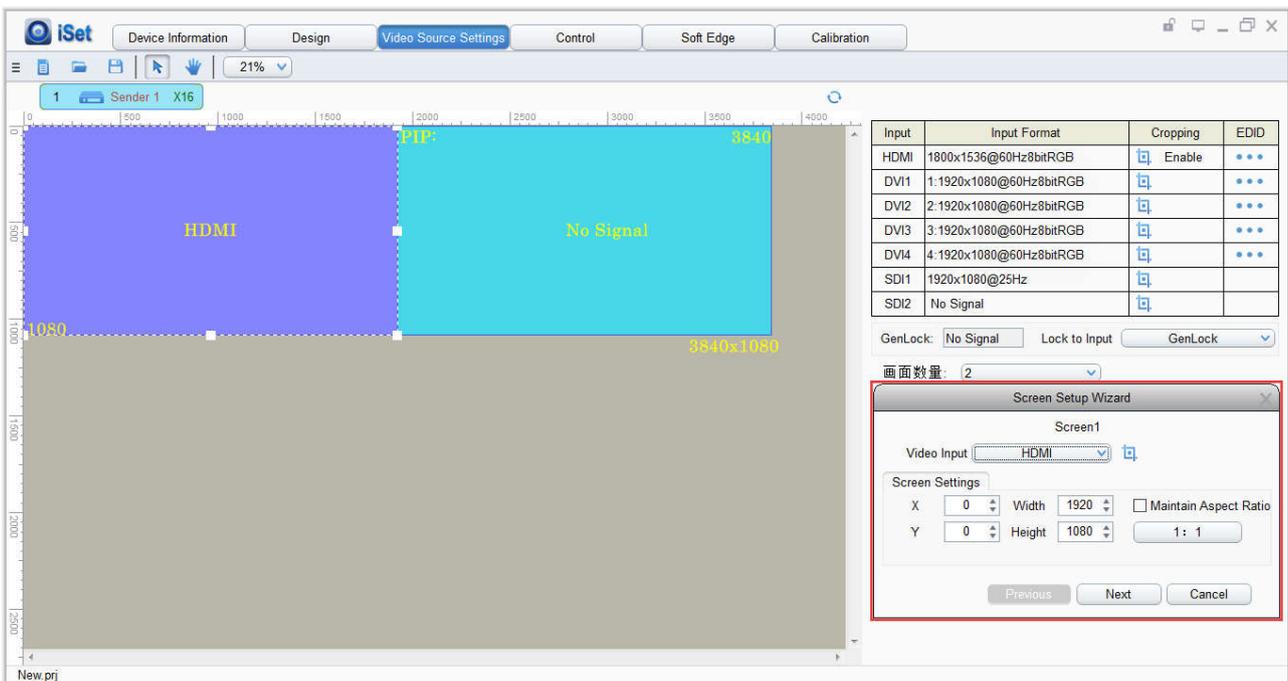
Similarly, select the input signal source of screen 2 in **[Video Input]**, then scale and crop the screen 2, then click **[Finish]** to complete the screen setup.
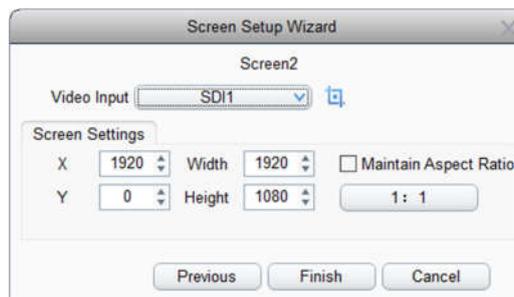
EDID

In **Input Signal Area**, select the specific signal source, then click "• • •" to enter the EDID setting interface.
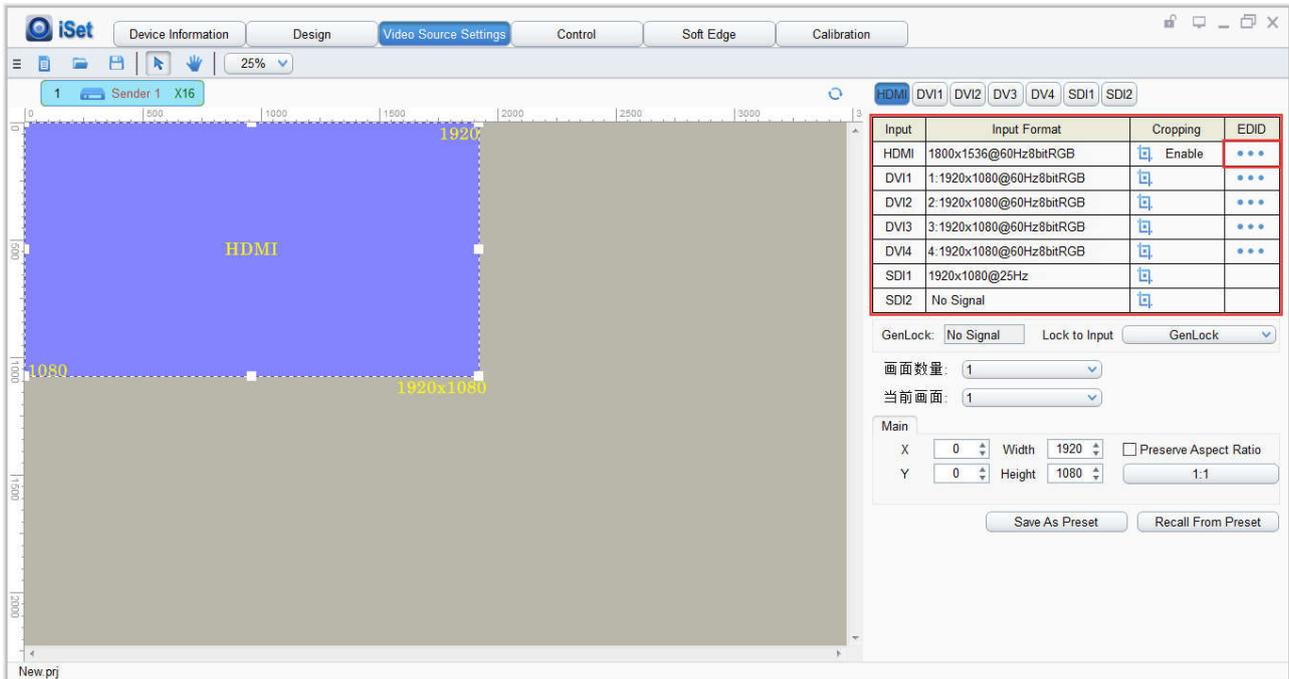
In the EDID setting interface, the first one is the default as current resolution.

Click the dropdown button to display the resolution list to select the mainstream resolution. You can also customize the sender resolution by setting the width, height, and frame rate.
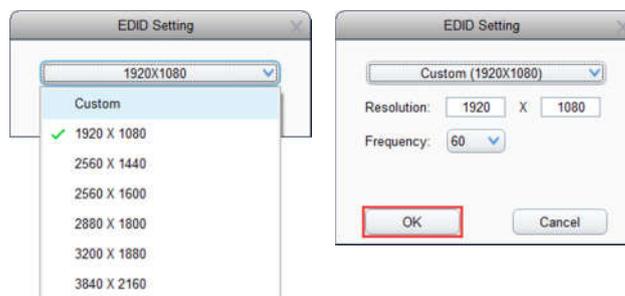
Preset

In **Video Source Settings**, 16 preset modes can be saved, and every preset mode includes all parameter information of the video source setting (scaling, cropping, several layers display, EDID, etc.). Users can directly recall from presets to display the image

according to their needs so that they don't need to set up all the parameters again.

After completing the video source parameters setup, click **[Save As Preset]**, **select unnamed preset** and **rename** it, then click **[OK]** to save the preset to the sending device; click **[Recall From Preset]**, send the saved preset to the receiver cards, at this time, the image should display on the basis of the preset parameter.
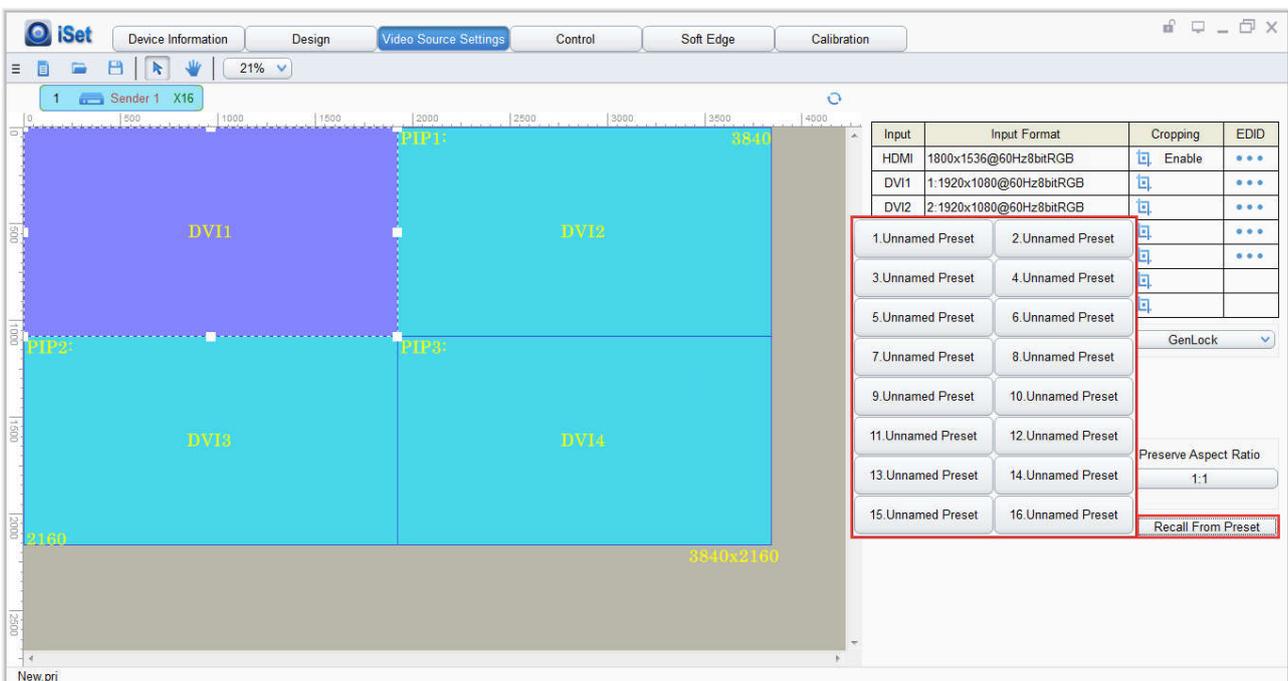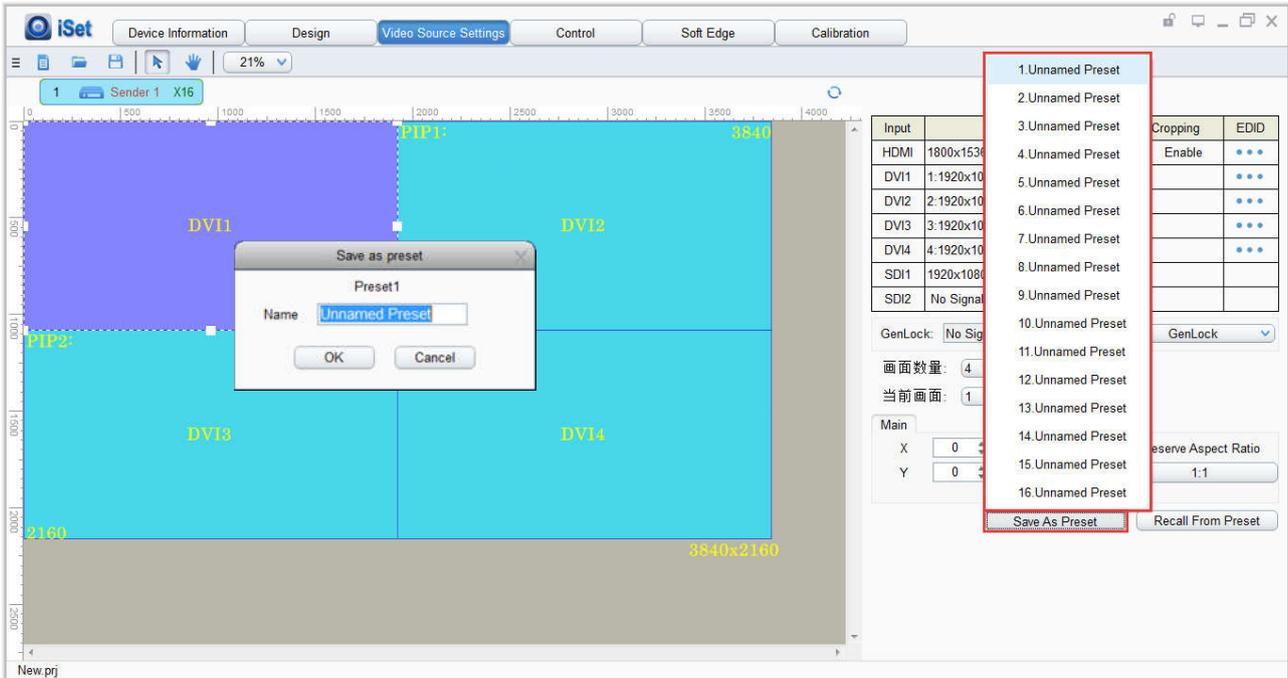
5.2.2 Sender Setting

Click **[Control]** to enter the sender setting interface. Select the specific sender. Users

can **adjust brightness and color temperature of the LED screen**, **set better gray**, **select test patterns**, and **freeze/black the screen** according to their needs.
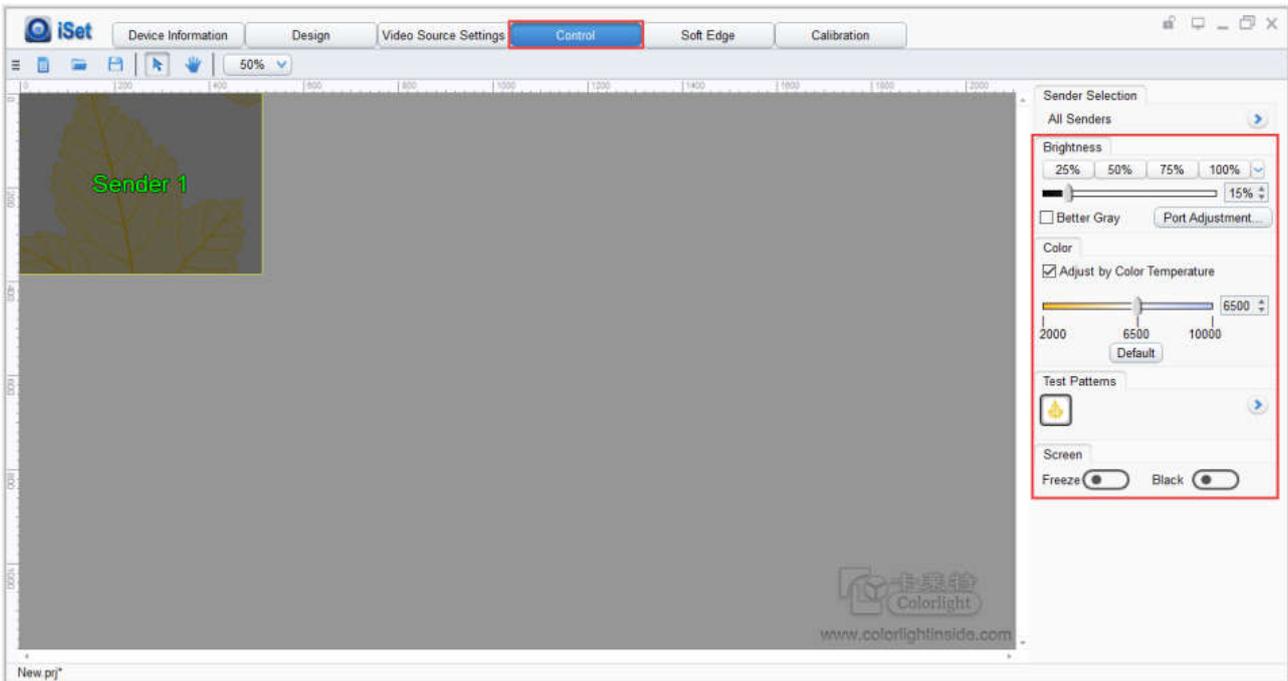
Click **[Design]**, right-click **[Sender]** and a shortcut menu will be popped out. In the shortcut menu, you can conduct the IP settings. Select "**Obtain an IP Address Automatically**" and the X16 will automatically obtain the assigned IP address; you can also set the IP address, subnet mask and default gateway manually. Click **[OK]** after completion.
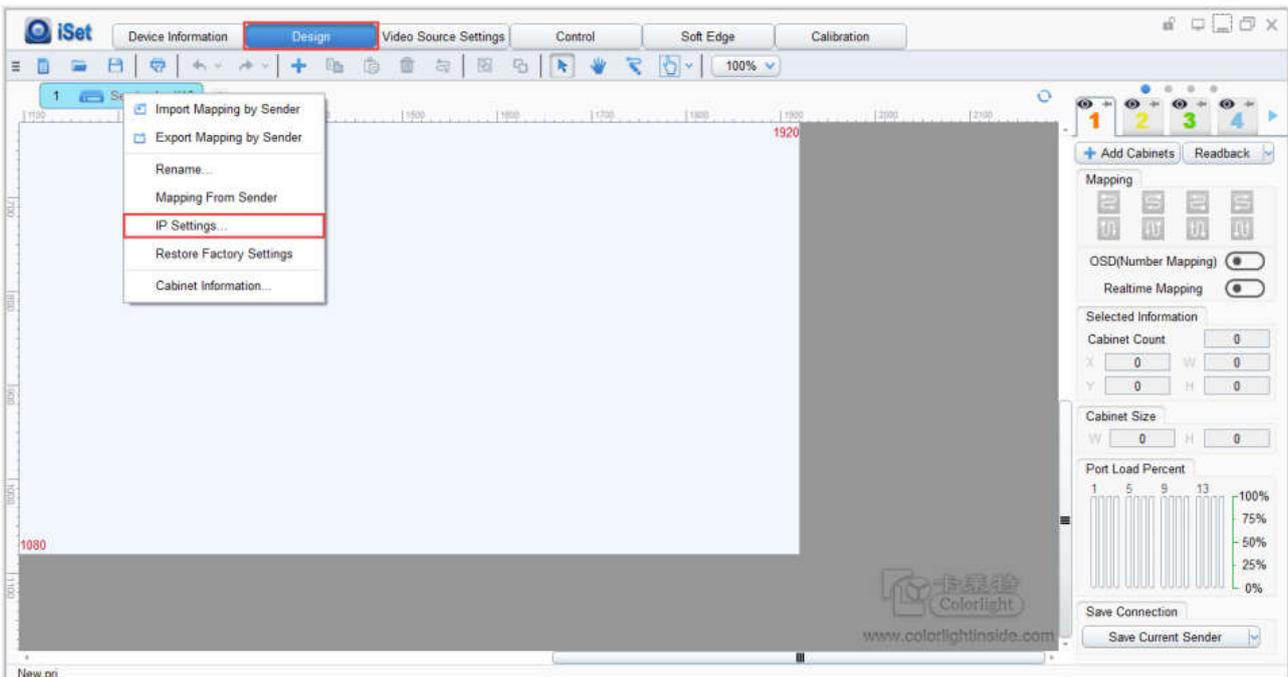
5.2.3 Screen Connection Setting

Click **[Design]** to enter the screen connection setting interface.
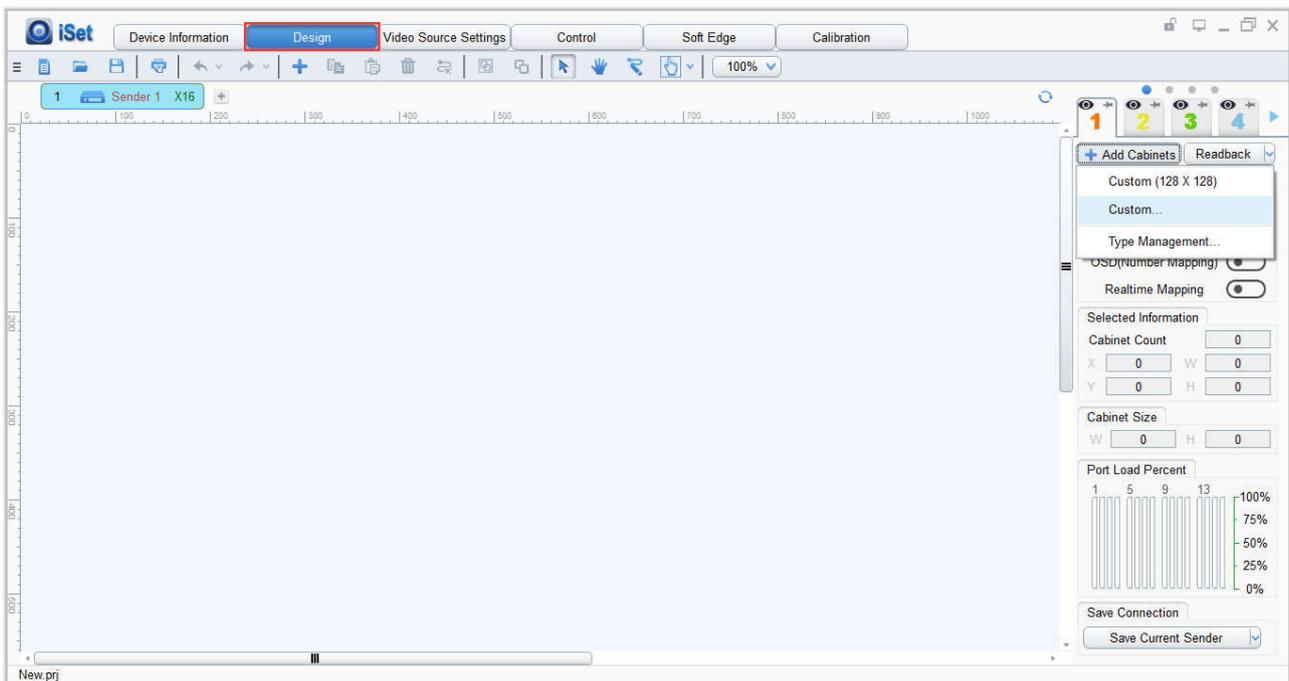
The specific steps are as follows:

1. Add cabinets

Choose the sender network port that needs cabinets added, click **[Add Cabinets]** and a drop-down box will appear. You can choose to add cabinets directly if the type management has the corresponding types, or you can click **[Custom]** to add customized cabinets according to the actual size of cabinets if the type management doesn't have the corresponding types.

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When adding cabinets, hold the left mouse button on the **View Area** and move the mouse to add the amount of cabinets after choosing the cabinet type.

After adding the amount of cabinets, if the array of the cabinets does not match with the real situation then the array needs to be set. Left-click to select the cabinet group, at this time, the lower right corner of the cabinet group will show a small box. Drag the small box using the mouse to set the array of the cabinets to match with the real situation; or you can directly set the number of cabinets in **[Selected Information]**.
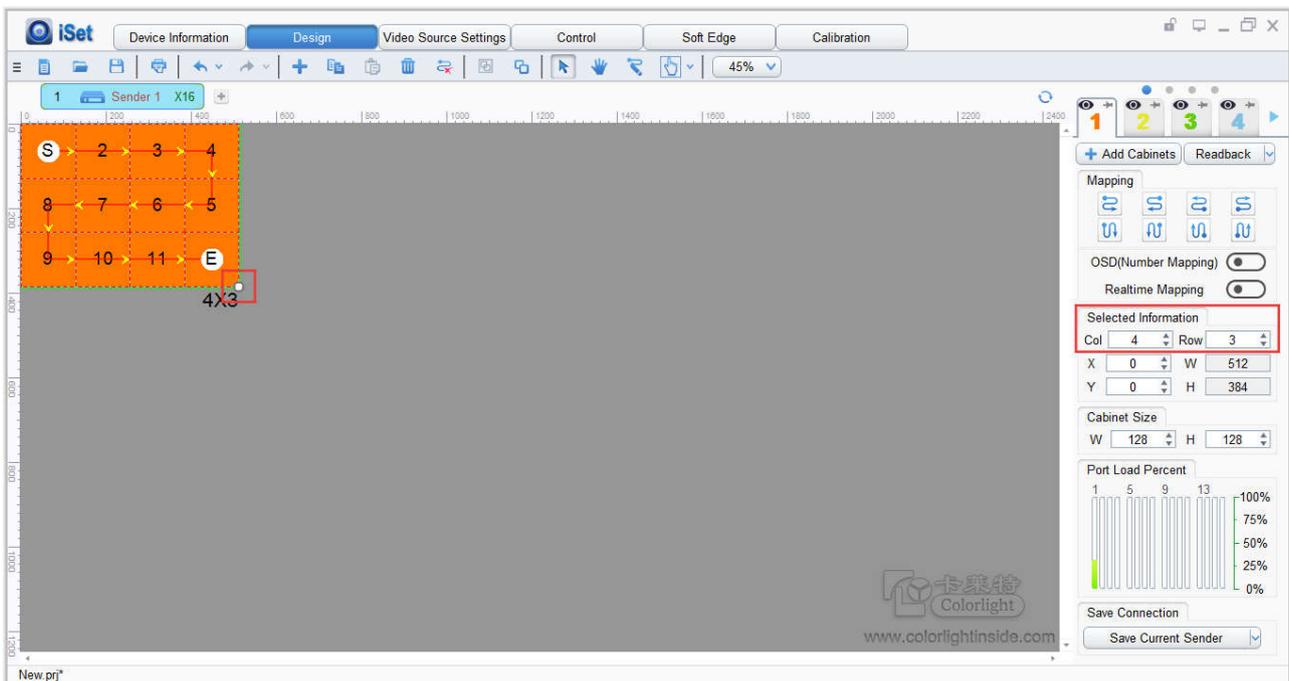
2. Set up mapping

Cable connections will be automatically created when adding cabinets, but if the connections do not match with the real situation then we need to reset the connections. **Select** the target **sender** and the **net port** from the right side, then **select** the corresponding **cabinets** within the net port actual control area, then set the connections in the mapping area.

There are two methods for set up:

① Manual Routing

In the mapping area, select the cabinet which corresponds to the first receiver card based on the actual connection of the net port (view from the front). Click on the "Manual Routing" button 🔧, put the mouse on the cabinet and left-click on it, then click the cabinets

one by one according to the actual cable connection until the last one for this network port loads.
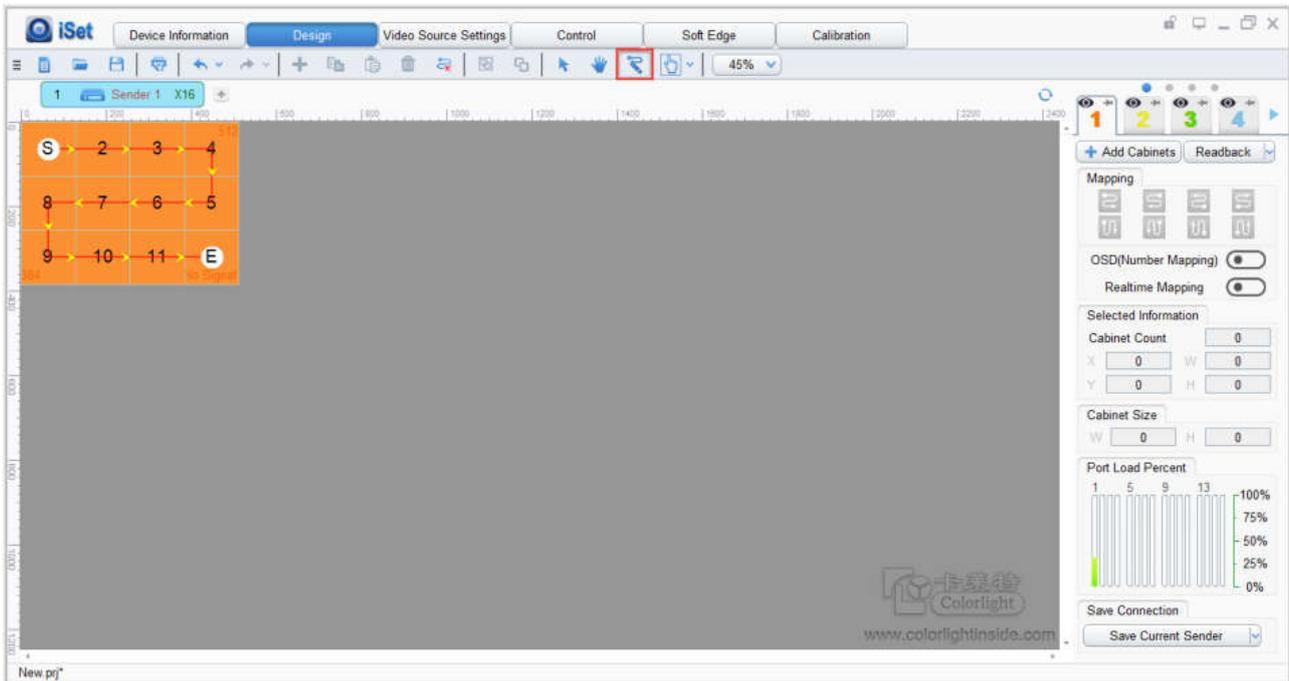
② **Auto Routing**

While aiming at the LED screen with the standard cable connections, first cover the corresponding area of net port loading in the mapping area, then select the cable connection you want from the right side, then complete the setting.

Notes: As the cabinets have multiple and different specifications (that is the inconsistent size of the cabinet), you can select the different one to adjust separately after completing the setting.

3. Save the mapping of the cabinets

When the mapping of the cabinets of each net port has been set, click **[Save Current Sender]** to save the mapping of all cabinets to the current sender. At this time, the screen should display normally.

6. LCD Operation Instructions

6.1 Operational Motion Instructions

Knob/OK:

● Press the knob/OK under main interface to enter operation interface of the menu;

● Rotate the knob to select menu or press the knob/OK under the operation interface of the menu to select the current menu or enter the submenu;

● Rotate the knob to adjust parameters after selecting the menu with the parameter and it will be automatically saved within one second.

ESC: Return key, to exit the current menu or operation.

6.2 Main Interface

After starting the X16, the main interface of the LCD display will be as follows:

First row: Company Logo

Second row: Signal source and resolution of the main image, Brightness

Third/forth row: Connection status of signal source, Temperature, Genlock

Fifth row: Connection status of the network port

Sixth row: Product name, IP address

6.3 Operation Instructions

Press the knob/OK to enter the operation interface of the main menu. It will include 11 operation instructions: **Display Setting**, **EDID Setting**, **Cropping Setting**, **Preset Setting**, **Output Setting**, **Output Shift**, **Lock to Input**, **Tile Mapping**, **Network Setting**, **Language Setting**, and **System Setting**.

1.Display Setting ►	9.Network Setting ►
2.EDID Setting	10.Language Setting
3.Cropping Setting	11.System Setting
4.Preset Setting	
5.Output Setting	
6.Output Shift	
7.Lock to Input	
8.Tile Mapping	
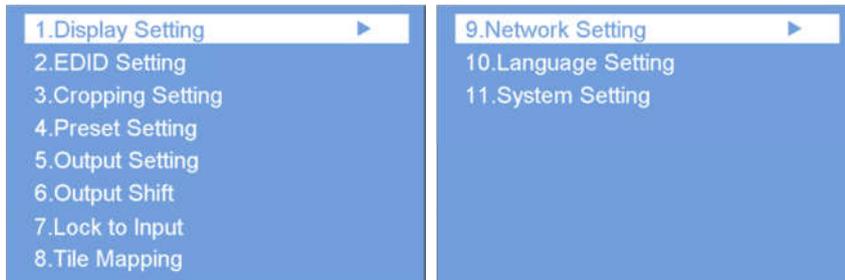
6.3.1 Display Setting

Rotate the knob to select display setting, then press the knob/OK to enter the submenu of "**Display Setting**".

1.Brightness	►
2.Color Temperature	
3.Black	⬤
4.Better Gray	⬤
5.Test Mode	
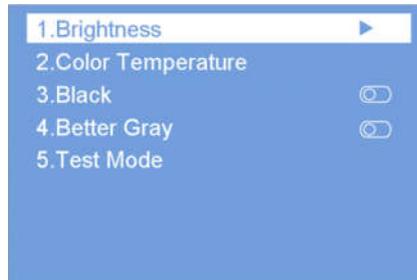
Brightness

Enter the adjustment interface of "**Brightness**". In the "**Broadcast Brightness**" option, press the knob/OK to turn on/off the broadcast brightness; in the "**Brightness**" option, press the knob/OK to select the current menu, then rotate the knob to change the brightness, and it will be auto saved if there is no following operation within one second.

1.Broadcast Brightness	⬤		1.Broadcast Brightness	⬤
2.Brightness	28%		2.Brightness	28%
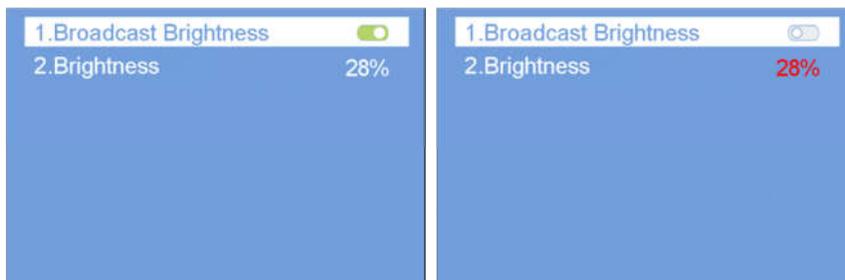
Color Temperature

Enter the adjustment interface of "**Color Temperature**". In the "**Color Temperature**" option, press the knob/OK to select the current menu, then rotate the knob to change the value of color temperature; in the "**Reset to Default**" option, press the knob/OK to reset the value of color temperature as 6500.


```
1.Color Temperature        6500
2.Reset to Default
```
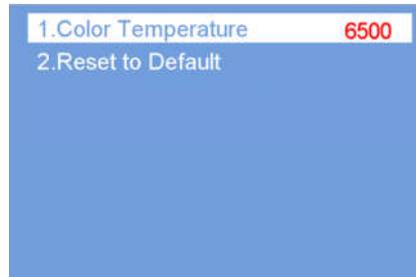
Black

Press the knob/OK to switch on/off the LED screen.

Better Gray

Press the knob/OK to turn on/off the "Better Gray" option.

Test Mode

Enter the setting interface of "**Test Mode**", rotate the knob to select test mode, or press ESC to go back to normal mode. In the "**Frame Rate**" option, press the knob/OK to select the current menu, then rotate the knob to change the frame rate (30/50/60Hz).


```
1.Frame Rate          60Hz      9.Left Slash Move Down      ✓
2.Normal               ✓        10.Right Slash Move Down
3.Red                           11.Grid Move Down
4.Green                         12.Gradient Red
5.Blue                          13.Gradient Green
6.White                         14.Gradient Blue
7.Horizontal Moving Line        15.Gradient White
8.Vertical Moving Line          16.Black
```

6.3 2 EDID Setting

Rotate the knob to select EDID setting, then press the knob/OK to enter the "**EDID Setting**" submenu.


```
1.HDMI        ▶
2.DVI1
3.DVI2
4.DVI3
5.DVI4
```
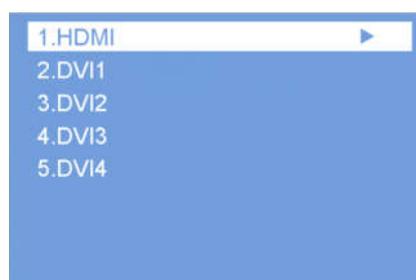
Enter the EDID setting interface of "**HDMI**" or "**DVI1/2/3/4**" (take "**HDMI**" as an example). Rotate the knob to select conventional resolution; or set width, height and frame rate by knob in the "**Custom**" option.

1.3840×2160			1.Width	1920
2.3200×1800			2.Height	1080
3.2880×1800			3.Frame rate	60
4.2560×1600			4.Save	
5.2560×1440				
6.1920×1200				
7.1920×1080	✓			
8.Custom	►			

6.3.3 Cropping Setting

Rotate the knob to select cropping setting, then press the knob/OK to enter the "**Cropping Setting**" submenu.

1.HDMI	►
2.DVI1	
3.DVI2	
4.DVI3	
5.DVI4	
6.SDI1	
7.SDI2	
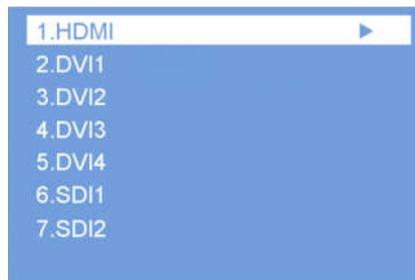
Enter the cropping interface of "**HDMI**", "**DVI1/2/3/4**", or "**SDI1/2**", then press the knob/OK to turn the crop on or off. If it has been enabled, set X, Y, width and height of the input signal with the knob, then save the data.

1.Enable	⬤
2.X	0
3.Y	0
4.Width	1920
5.Height	1080
6.Save	

6.3.4 Preset Setting

Rotate the knob to select preset setting, then press the knob/OK to enter the "**Preset Setting**" submenu.

```
1.Load Preset          ▶
2.Save to Preset
```

In the submenu, 16 preset parameters can be saved, and every preset parameter includes all parameter information of the video source setting (scaling, cropping, several layers display, EDID, etc.). Users can also directly load the saved preset parameters to display the image according to their needs so that they don't need to set up all the parameters again.

```
1.Unnamed              9.Unnamed
2.Unnamed              10.Unnamed
3.Unnamed              11.Unnamed
4.Unnamed              12.Unnamed
5.Unnamed              13.Unnamed
6.Unnamed              14.Unnamed
7.Unnamed              15.Unnamed
8.Unnamed              16.Unnamed
```

6.3.5 Output Setting

Rotate the knob to select output setting, then press the knob/OK to enter the "**Output Setting**" submenu. In the "**Number Of Pictures**" option, press the knob/OK to select the current menu, then rotate the knob to set the number of pictures 1-7; in the "**Main**" or "**PIP**" option, press the knob/OK to enter the output setting interface, then rotate the knob to set the input signal of the output and adjust X, Y, width, and height of the output. Save the changes after completion.

```
1.Number Of Pictures  7      1.InputNumber      HDMI
2.Main                       1.X                   0
3.PIP1                       2.Y                   0
4.PIP2                       3.Width             960
5.PIP3                       4.Height           1080
6.PIP4                       5.Save
7.PIP5
8.PIP6
```
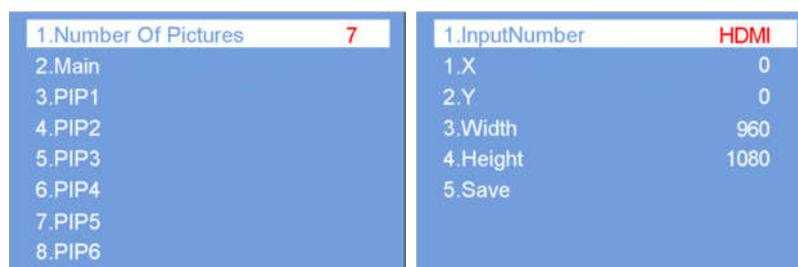
6.3.6 Output Shift

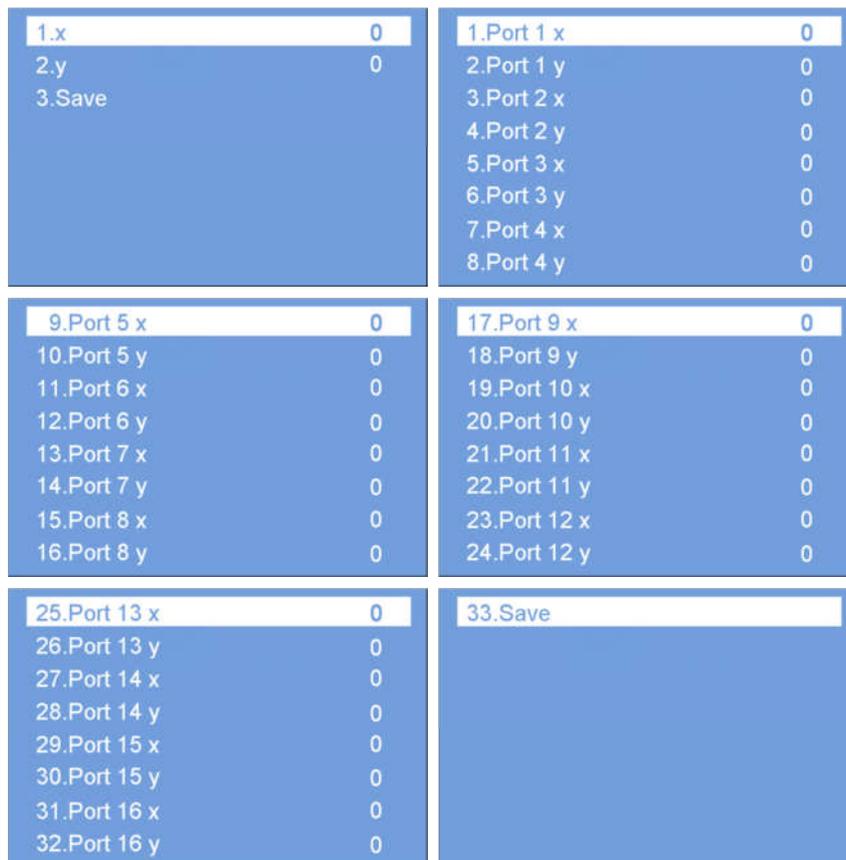Rotate the knob to select output shift, then press the knob/OK to enter the "**Output Shift**" submenu.

```
1.Whole              ▶
2.By Port
```

Output shift includes two selections: "**Whole**" and "**By Port**". In the setting interface of "**Whole**", you can rotate the knob to set X and Y of the whole image, then save it; in the setting interface of "**By Port**", you can set X and Y of the image of each net port respectively and also save it.

```
1.x              0      1.Port 1 x       0
2.y              0      2.Port 1 y       0
3.Save                  3.Port 2 x       0
                        4.Port 2 y       0
                        5.Port 3 x       0
                        6.Port 3 y       0
                        7.Port 4 x       0
                        8.Port 4 y       0

 9.Port 5 x      0     17.Port 9 x       0
10.Port 5 y      0     18.Port 9 y       0
11.Port 6 x      0     19.Port 10 x      0
12.Port 6 y      0     20.Port 10 y      0
13.Port 7 x      0     21.Port 11 x      0
14.Port 7 y      0     22.Port 11 y      0
15.Port 8 x      0     23.Port 12 x      0
16.Port 8 y      0     24.Port 12 y      0

25.Port 13 x     0     33.Save
26.Port 13 y     0
27.Port 14 x     0
28.Port 14 y     0
29.Port 15 x     0
30.Port 15 y     0
31.Port 16 x     0
32.Port 16 y     0
```

6.3.7 Lock to Input

When several controllers are cascaded with each other, "**Lock to Input**" is necessary to ensure the synchronization of the video displays. Rotate the knob to select "**Lock to Input**", then press the knob/OK to enter the submenu. Rotate the knob to select the sync signal source in the submenu, then press the knob/OK for completion.
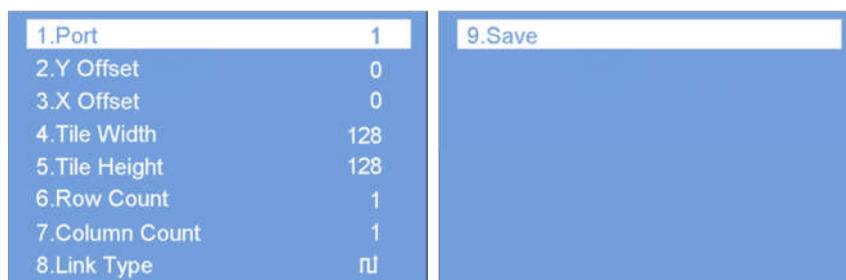
```
1.No Genlock
2.Genlock              ✓
3.HDMI
4.DVI1
5.DVI2
6.DVI3
7.DVI4
```

6.3.8 Tile Mapping

Rotate the knob to select tile mapping, then press the knob/OK to enter the "**Tile Mapping**" submenu.

```
1.From Sender          ⬤
2.Set By Port
```

In the submenu, press the knob/OK to set sender as the connection source. At this time, rotate the knob and press the knob/OK to enter the setting interface, select the net port of what needs to be set, then set the offset values of X and Y. You can also set the tile width, tile height, row count, column count and link type of the corresponding cabinets. Save all of the parameters afterwards.

```
1.Port              1      9.Save
2.Y Offset          0
3.X Offset          0
4.Tile Width      128
5.Tile Height     128
6.Row Count         1
7.Column Count      1
8.Link Type        ⨅
```

6.3.9 Network Setting

Users can automatically obtain an IP address or set it manually. Enter the "**Network Setting**", press the knob/OK to turn on/off HDCP or press the knob/OK to enter IP settings manually. You can set up IP, subnet, and gateway respectively via the knob.

1.HDCP	
2.IP Setting	
IP:	
192.168.1.192	

1.IP	►
2.Subnet	
3.Gateway	

3.6.10 Language Setting

Enter the setting interface of "**Language**", then press the knob/OK to switch the language.

| 1.English | ✓ |
| 2.Chinese | |

6.3.11 System Setting

In "**System Setting**", users can restore factory settings and check the current version details and information.

1.Restore Factory Setting	►
2.Version	
3.Version Info Detail	

Visual Future

Colorlight US, Inc.