# Colorlight

Z4 Super Controller

USER MANUAL

# Content

# 1 Overview

Z4 is a professional LED display controller. As video splicer, processor and sender in one combined, Z4 has high capability of video signal reception, processing and transmission. It achieves excellent high-definition images and flexible image control function. Z4 can be applied to popular rental display and common fixed display perfectly.

Features:

- Video input ports including 1xHDMI (with loop), 1xDVI (with loop), 2×SDI, 1×DP
- Input resolution up to 1920×1200@60Hz
- The input images can be scaled according to the screen resolution
- Support PIP function, the location and size can be adjusted freely
- Support 12bit HD video source
- Loading capacity: 2.3 million pixels; Maximum Width: 4096 pixels, Maximum Height: 4096 pixels
- Support splicing and cascading among several controllers with synchronization strictly
- Support brightness and chromaticity adjustment, color gamut transformation
- Support zero latency of sending
- Support improved gray-scale at low brightness
- Support HDCP1.4
- Compatible with all receiving cards, multifunction card, optical fiber transceivers of Colorlight

# 2 Appearance

**Front Panel**



| No. | Name | Function |
|---|---|---|
| 1 | 1.8-inch LCD | Display operation menu and system information |
| 2 | Knob | Turning knob to select or adjust |
| 3 | Function keys | OK: Enter key<br>ESC: Escape current operation or selection<br>Bright: Brightness option<br>Black: Blank screen |
| 4 | Selection keys | Mode: Output mode selection of images<br>Freeze: Freeze screen<br>Lock: Lock keys<br>DVI/HDMI/SDI1/SDI2/DP: Set up video source input |

**Back Panel**



| Input Interface | | |
|---|---|---|
| 1 | HDMI | HDMI1.4 input with loop |
| 2 | DVI | DVI input with loop |
| 3 | SDI | 2x3G-SDI inputs |
| 4 | DP | DP input |
| **Output Interface** | | |
| 1 | Gigabit Ethernet | 4 Neutrik Gigabit Ethernet outputs |
| 2 | HDMI | HDMI monitoring output |
| **Controlling Interface** | | |
| 1 | 100M Ethernet | Network Control (communication with PC, or access network) |
| 2 | USB_OUT | USB output, cascading with next controller |
| 3 | USB_IN | USB input, connection with PC to configure parameters |

# 3 Signal Connection
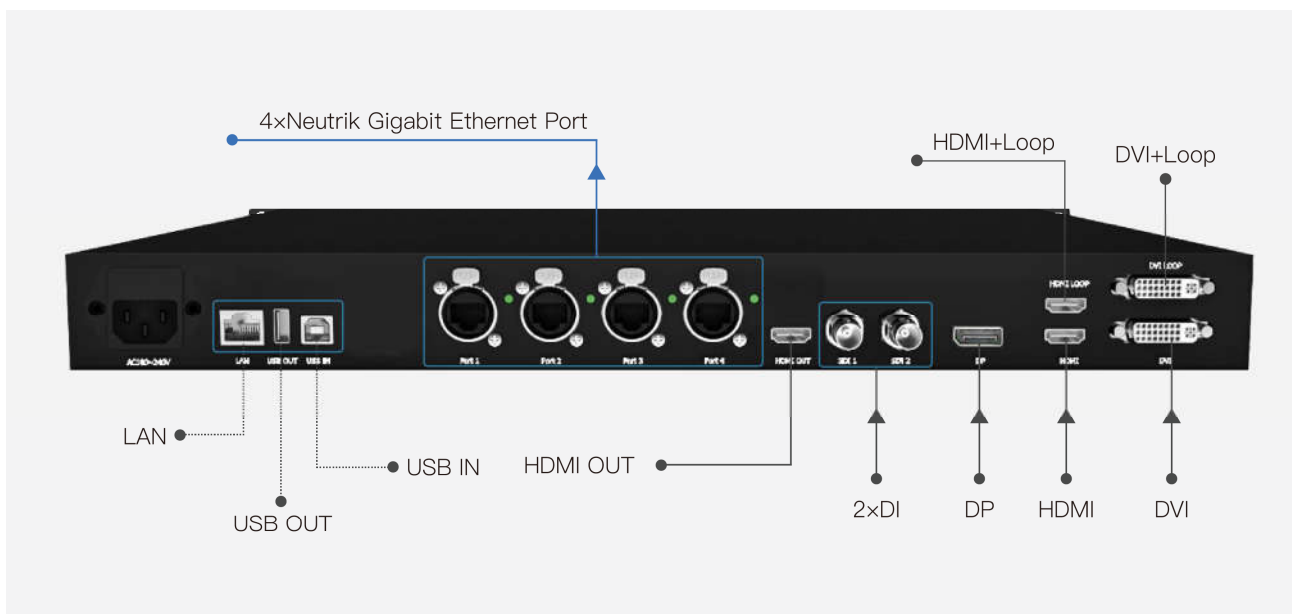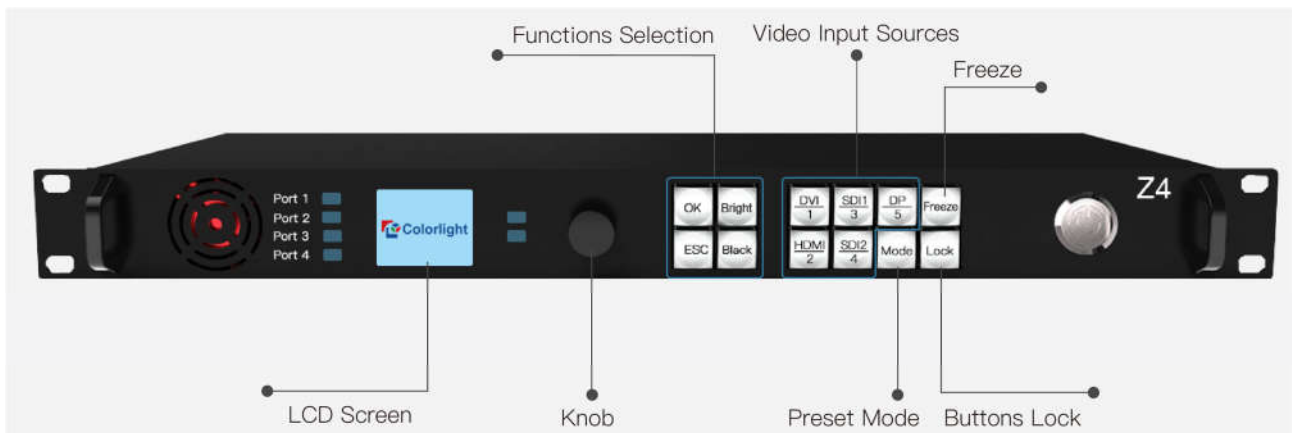
# 4 LEDVISION Installation

Please download the installation package of the LEDVISION software from Colorlight's official website, and complete the installation according to the diagrams shown below.

1. Run the software package, and select **[English]** for installer language. Click **[OK]** to move on.
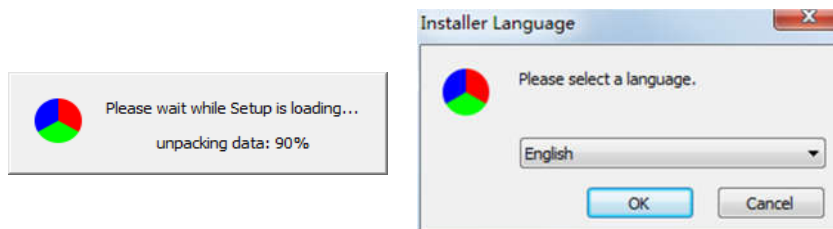
2. After selecting a language, an installation wizard like below will appear, click **[Next]**; Then choose installation location, click **[Browse]** to change default target location, then click **[Next]** after completing;
Choose components according to your own computer status, click **[Install]** to complete;
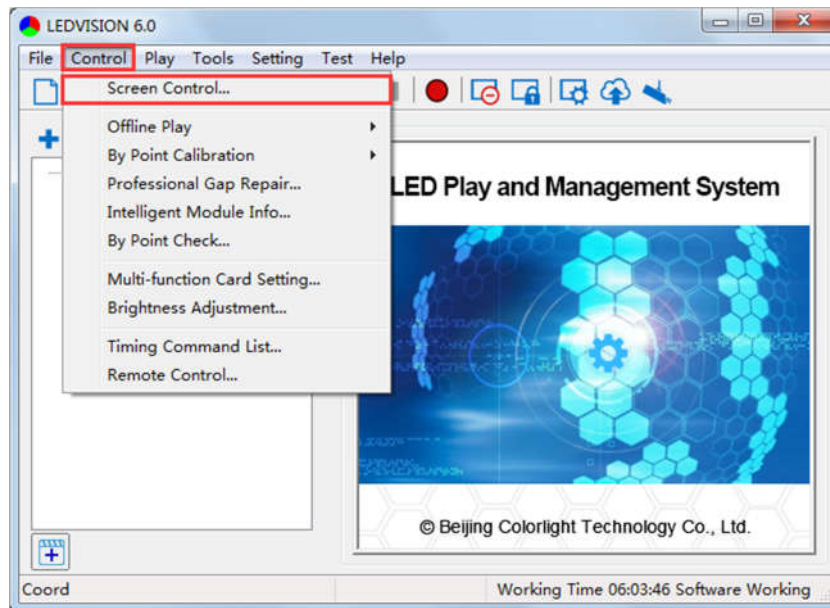After the installation is complete you are ready to use LEDVISION.
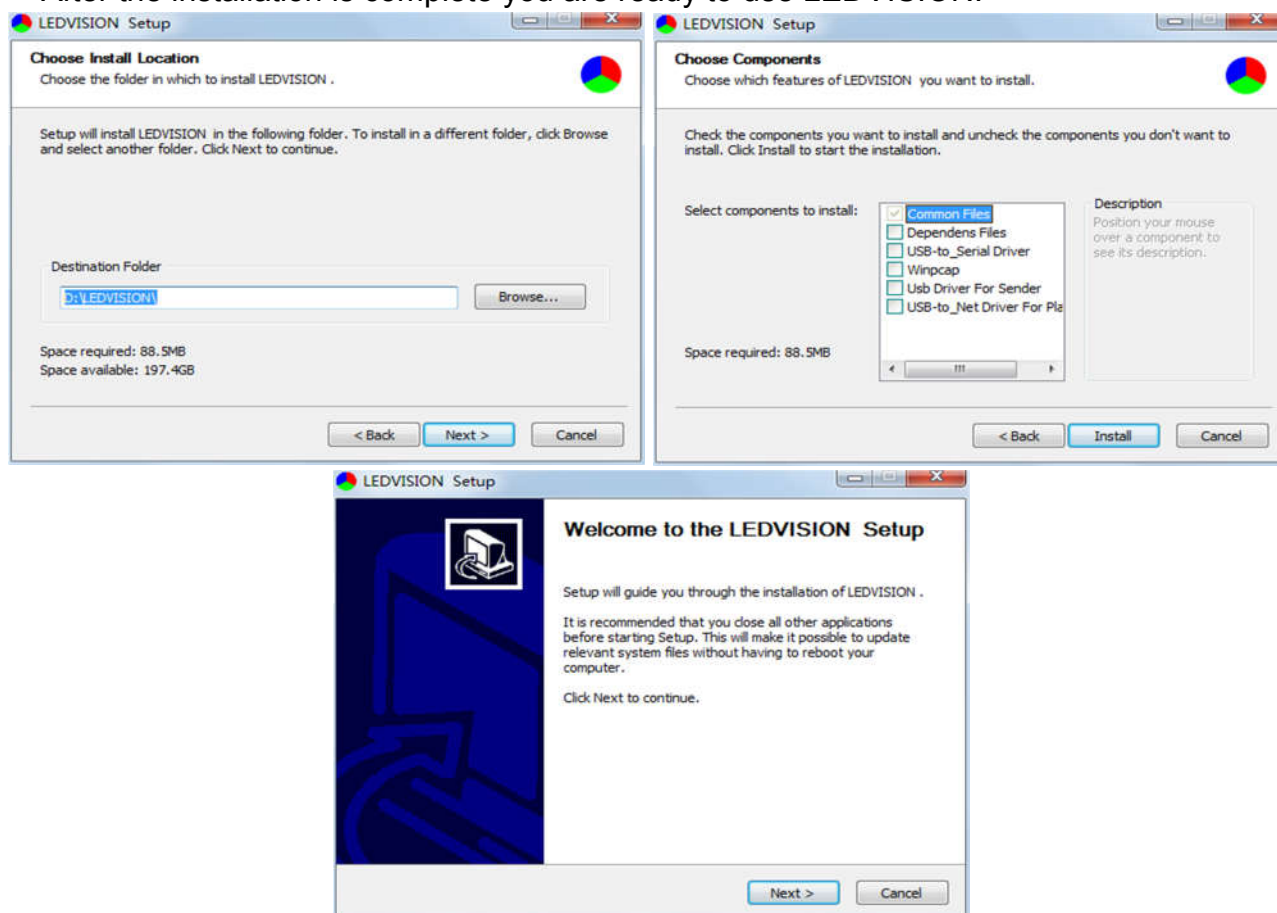
# 5 Parameter Configuration

Please make sure the correctness of the hardware connection before setting, use LEDVISION to detect sender and all receiving cards.

## 5.1 Detect Sender and Receiving Card

1. Run LEDVISION, click **[Control]** – **[Screen Control]** to enter the Screen Control window.



2. **[Select Sending Device]** for **[Sender]**, click **[Detect Senders]** in **[Sender Settings]**. Please check the hardware connection or the installation of relevant driver if cannot detect senders.

Select network port and click **[Detect Receiver Cards]** respectively, the software will automatically acquire the receiver card quantity of each network port of the sender. Please check corresponding cable if the numbers of receiver card are inconsistent with actual status.
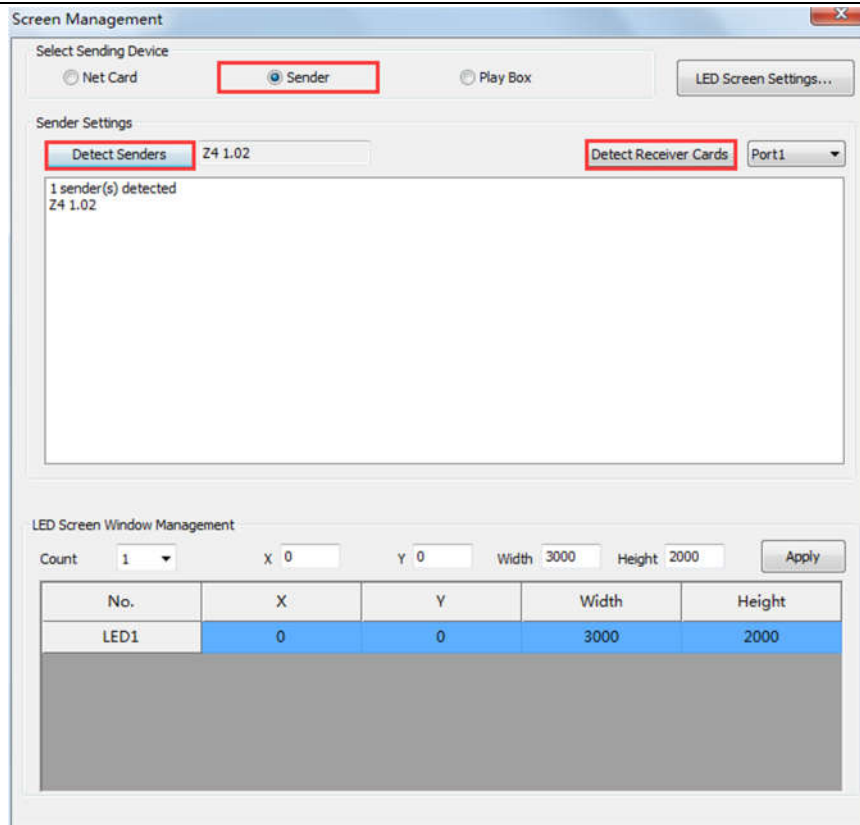
## 5.2 LED Screen Setting

Click **[LED Screen Settings]** to enter the LED Screen Setting interface, and set up **"Sending Device"**, **"Screen Parameters"**, "**Connection Parameters**".
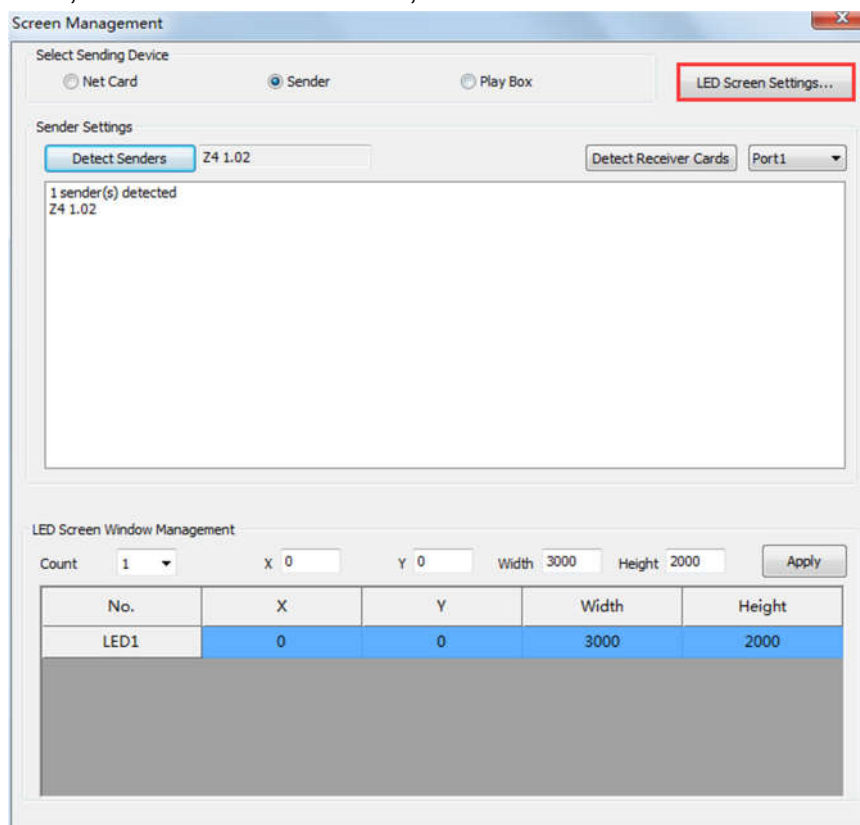
# 5.2.1 Sending Device Setting

[Select Sending Device] for [Sender], and detect senders. Sending Device Setting includes 6 parts: Output, Control Area, EDID, Network, Other, Detect Receivers.

## 1. Output

### ① Signal Source

When the input signal source of Z4 is normal, the upper right of the software interface will display the input signal information auto acquired via the software. Users can select specific signal source (HDMI/DVI/SDI1/SDI2/DP) according to needs in [Main]; If PIP mode has been open, users can also select specific signal source (HDMI/DVI/SDI1/SDI2/DP) in [PIP]. At the moment, the image of selected signal source will display in the **Image View Area** on the left of the software interface.
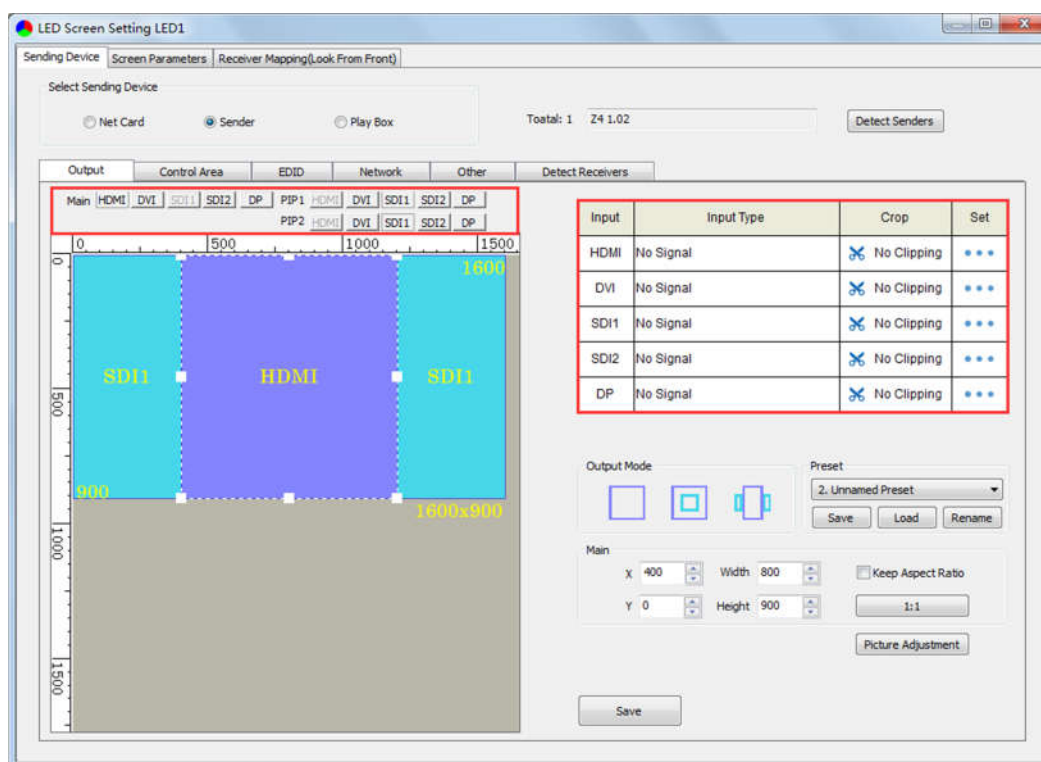


**Note: Main and PIP can't select the same source. When PIP1 and PIP2 exist in output mode at the same time, PIP1 and PIP2 can select the same source.**

### ② PIP

There are three output modes of main image and PIP in **Output Mode**, users can select specific PIP mode based on the requirement, and conduct the operation like move, scaling and clipping on the main image and PIP image respectively.
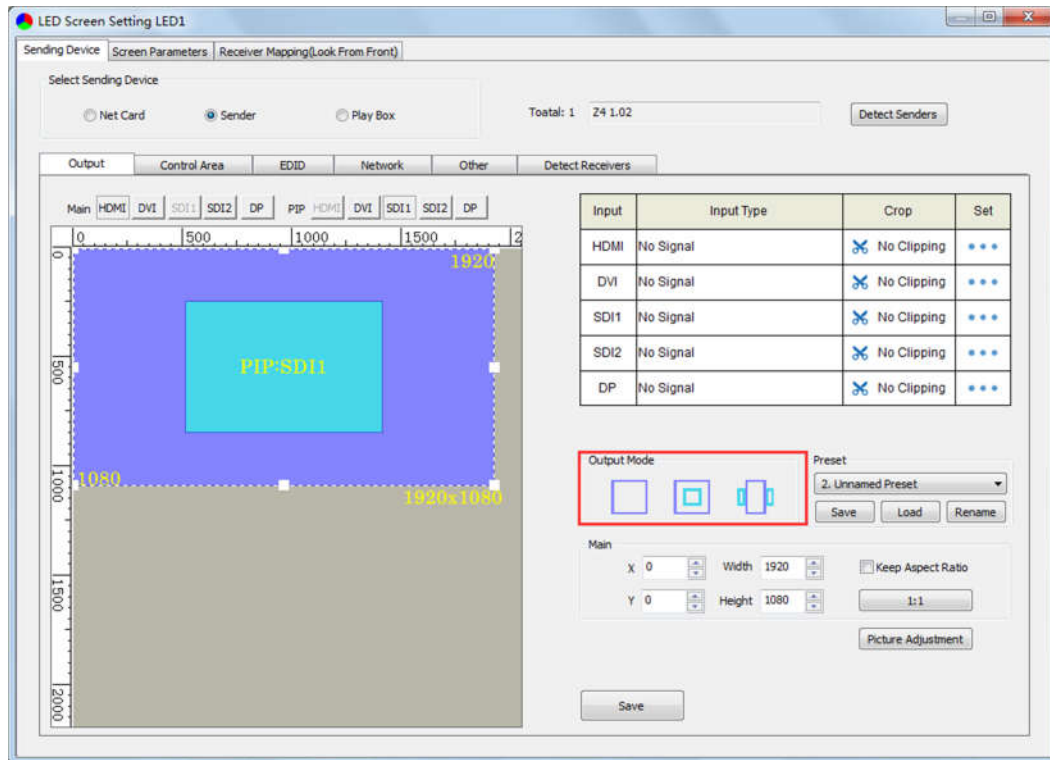
### ③ **Scaling**

In **Image View Area**, select the image that needs to be scaled, set X, Y, width and height of it in **[Main]** or **[PIP]**, or you can click the white box in the bottom right corner of the image and drag it with the mouse, finally click **[Save]**.
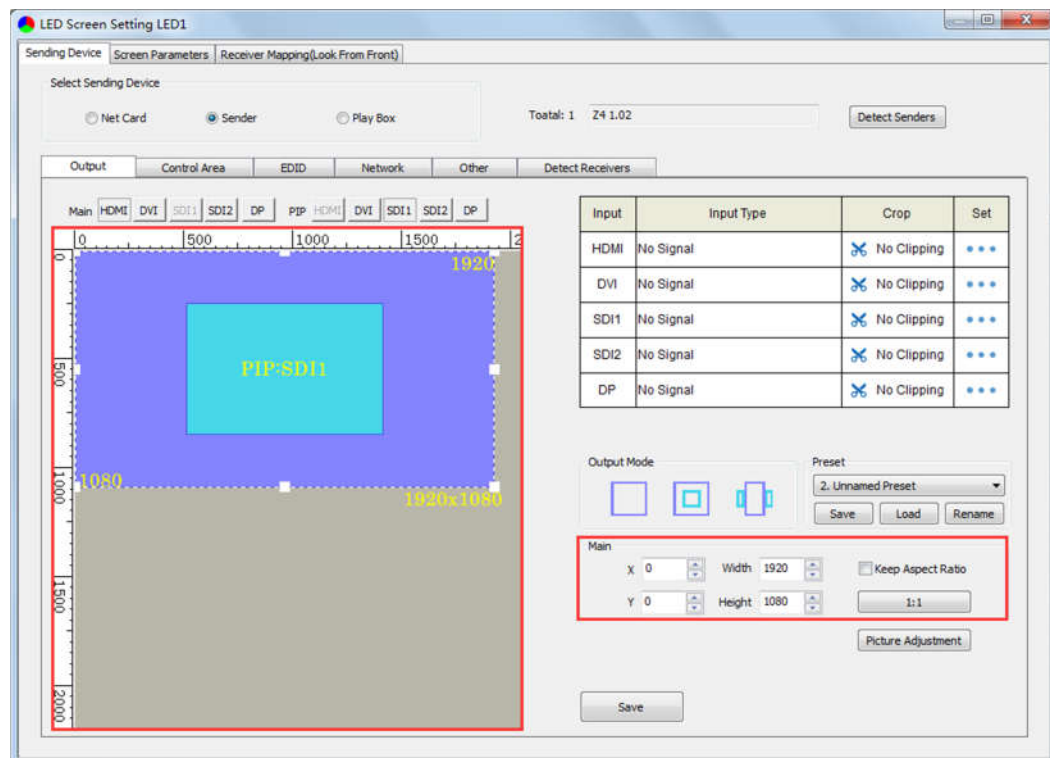
④ **Clipping**

Select signal source of the image that needs to be clipped in **Input Signal Area**, click **[Set]** to enter the clipping interface.
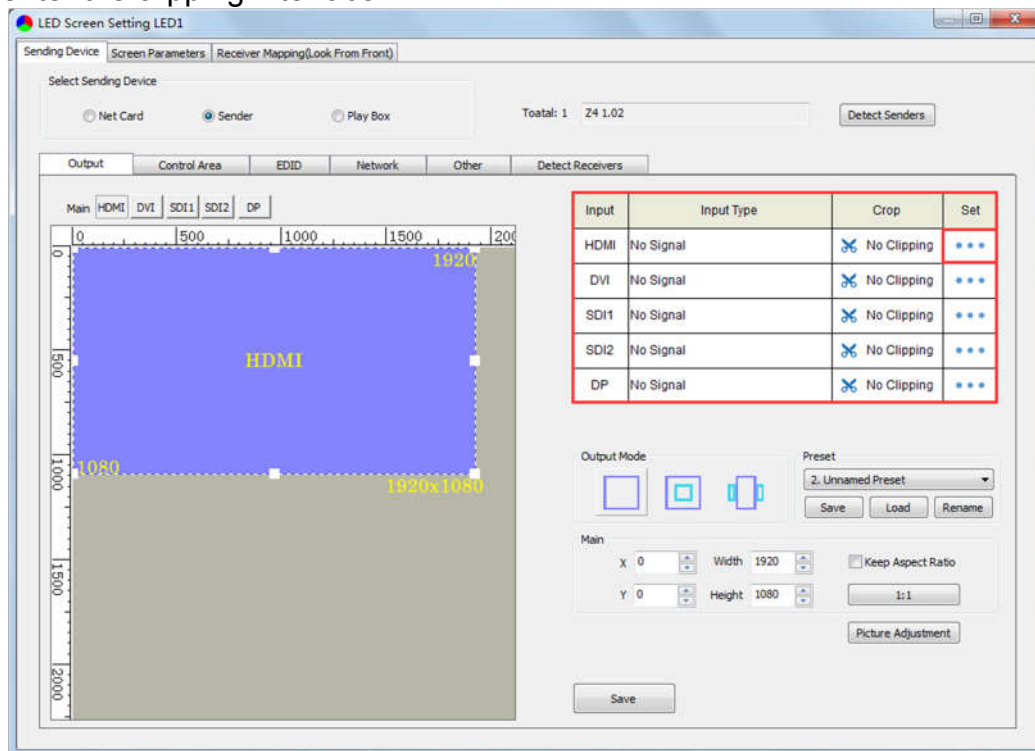


In the clipping interface, check **[Crop]**, and set X, Y, width and height in **[Cropping Settings]**, then click **[Save]** to complete.

⑤ **Picture Adjustment**

Click **[Picture Adjustment]**, enter the interface of picture adjustment. Check **[Enable]**, and adjust hue, saturation, brightness compensation and contrast ratio of the whole image, then click **[Save]** to complete. After setting, you can click **[Default Settings]** to restore the defa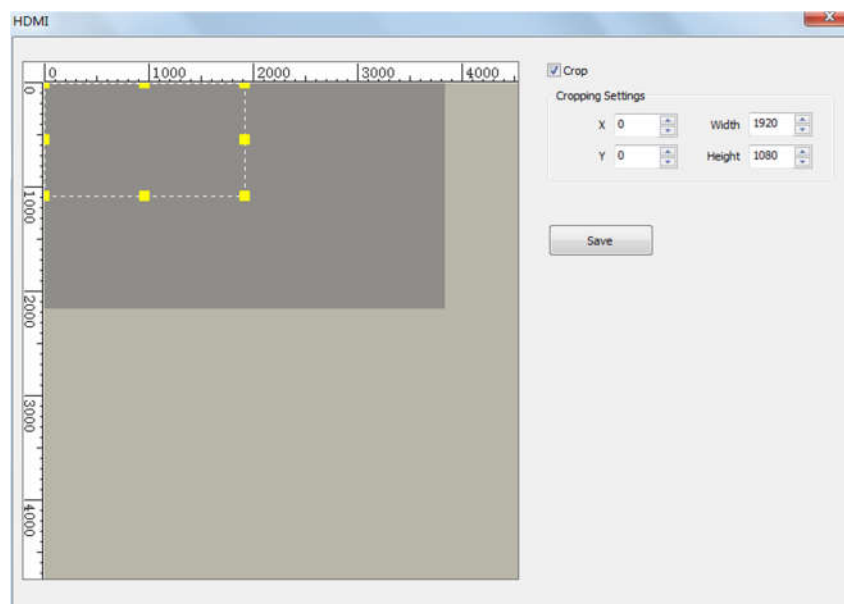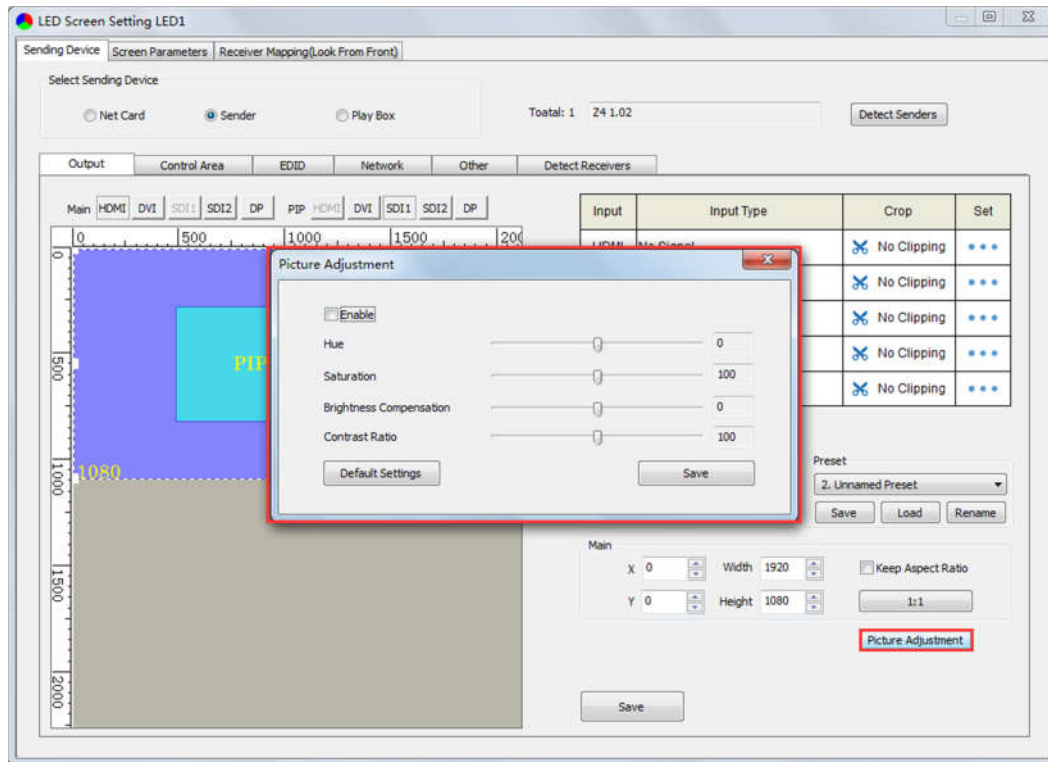ult values of every parameter, that is, hue and brightness compensation default to 0, saturation and contrast ratio default to 100.



⑥ **Preset**

In **[Preset]**, 16 preset parameters can be saved, and every preset parameter includes all parameter information of image output (signal source, PIP, scaling, clipping, picture adjustment), users can directly load one preset parameter to display the image according to needs, and don't need to set up all parameters again.

After completing setting up all parameters of image output, **select** unnamed preset, click **[Save]** to save the parameter to sending device; click **[Load]**, send the parameter to receiving cards. At the time, the image should display on the basis of preset parameter.
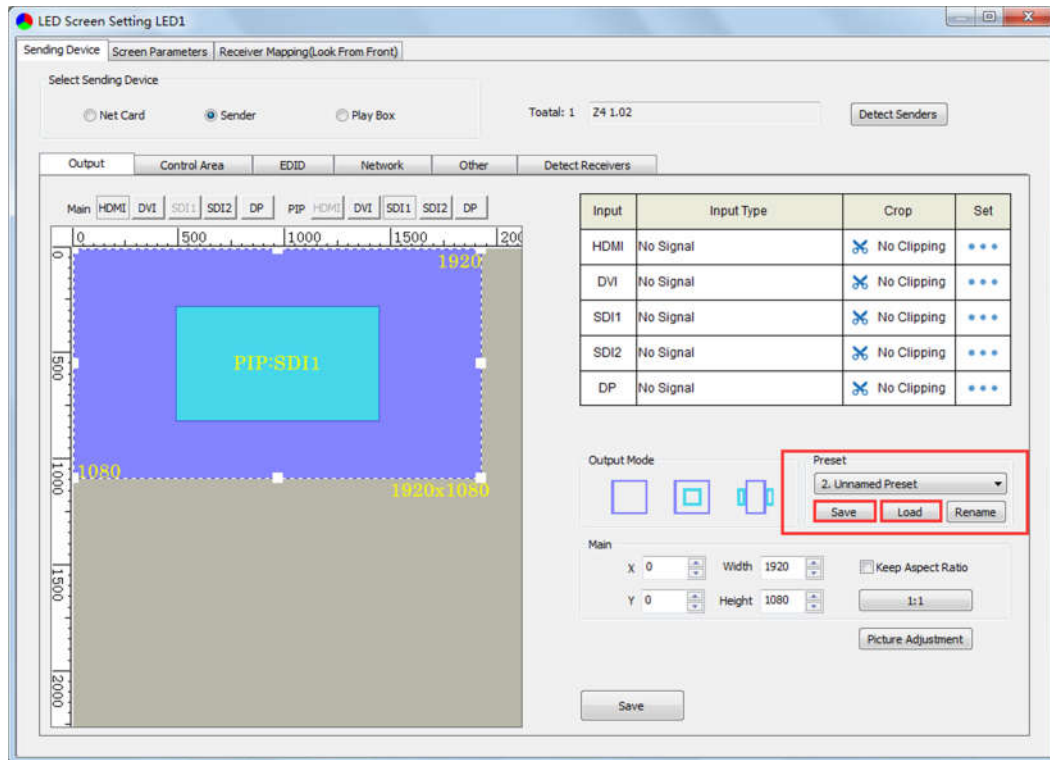
2. In **Control Area**, it displays the control area of each net port of Z4. Click **[Import]** and select correct parameter file, click **[Save]** to save parameters into corresponding sender; or set up the control area of each net port respectively (X, Y, Width, Height), click **[Save]**.
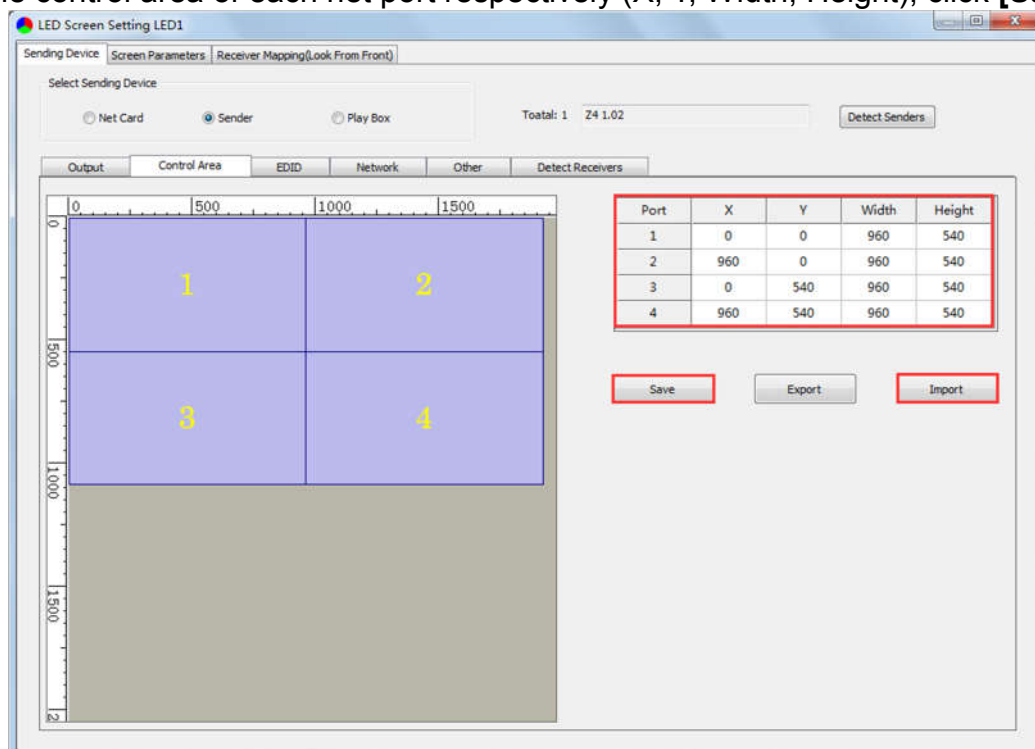


3. **EDID**: Set sender resolution, the first one is the default as current resolution.
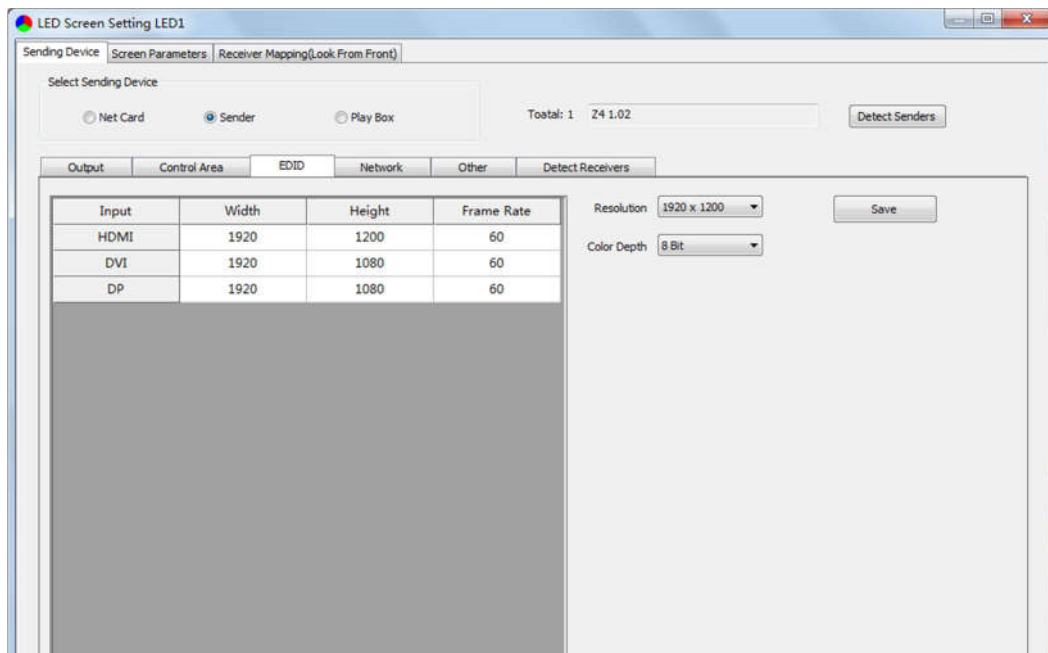
Click the dropdown button to display the resolution list to select the mainstream resolution, and you can also customize the sender resolution, by setting the width/height and frame rate.

Click **[Save]** after setting.



4. **Network**: Set up IP address, select "Obtain an IP Address Automatically", then the sender would auto obtain the IP address; or it would manual set up IP Address, Subnet Mask and Default Gateway.
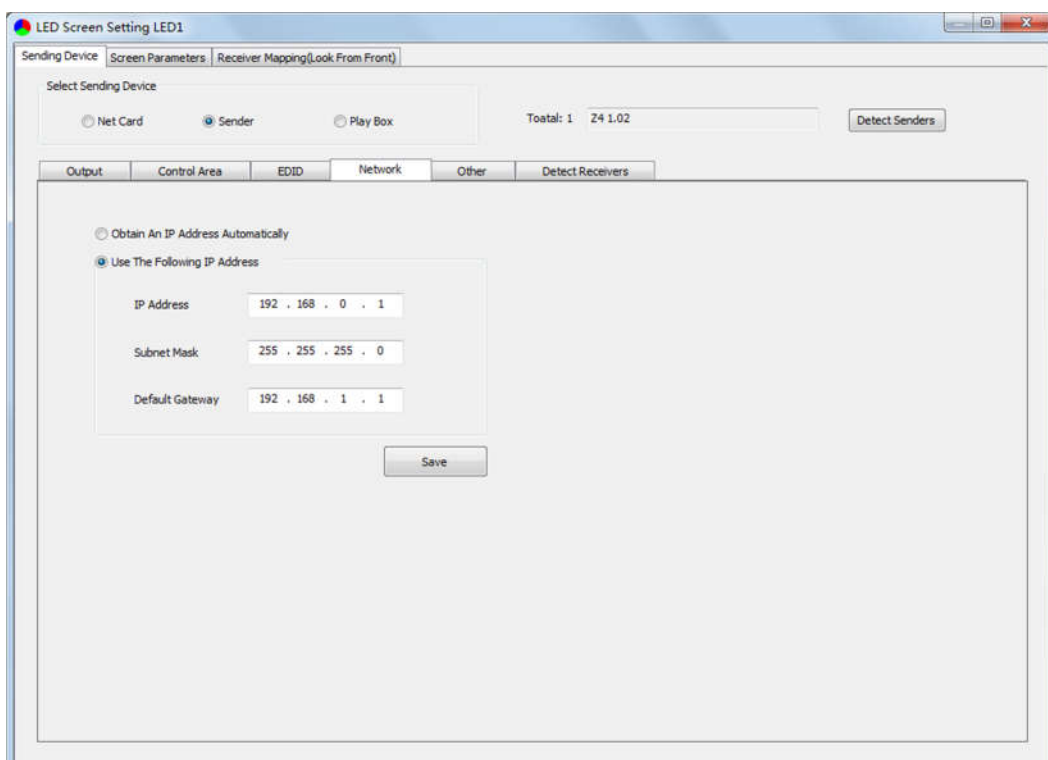
5. **Other**: Advanced Parameters Setting (Better Graylevel on Low Brightness, Mapping From Sender, Output Mode, Sender Name), Test Mode Selection, Factory Restore.
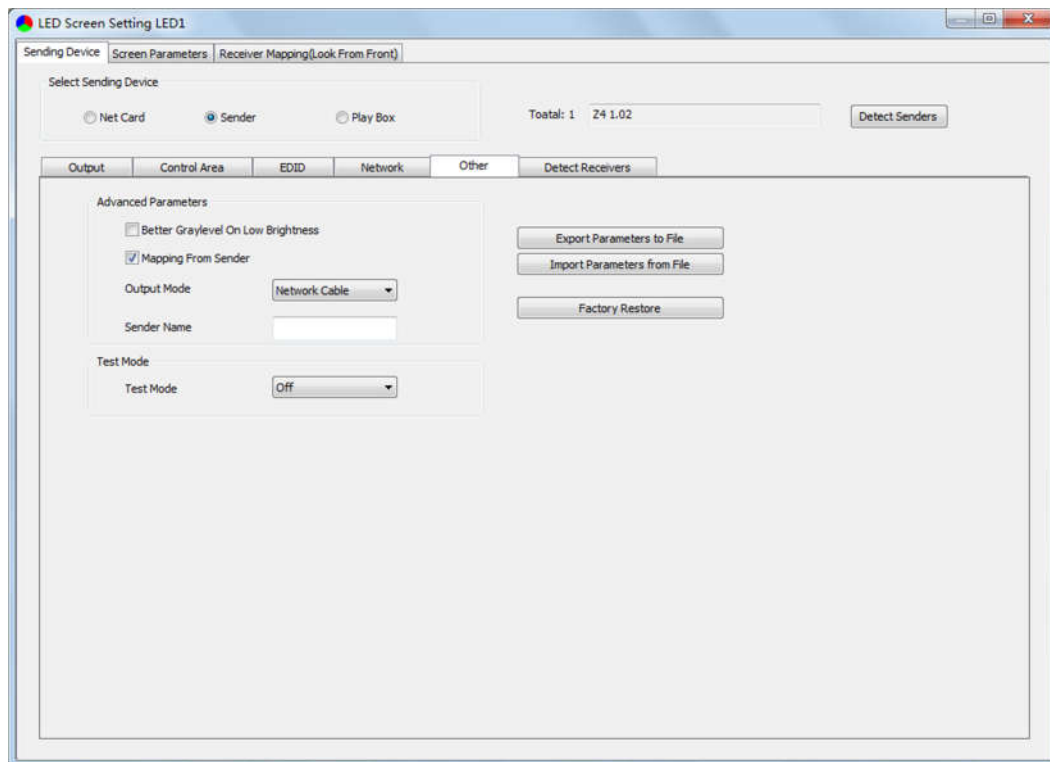


6. **Detect Receivers**: Detect receivers under each net port of Z4 controller, and acquire relevant information about the receivers (Port, Index, Version, Run Time, Support Chips).
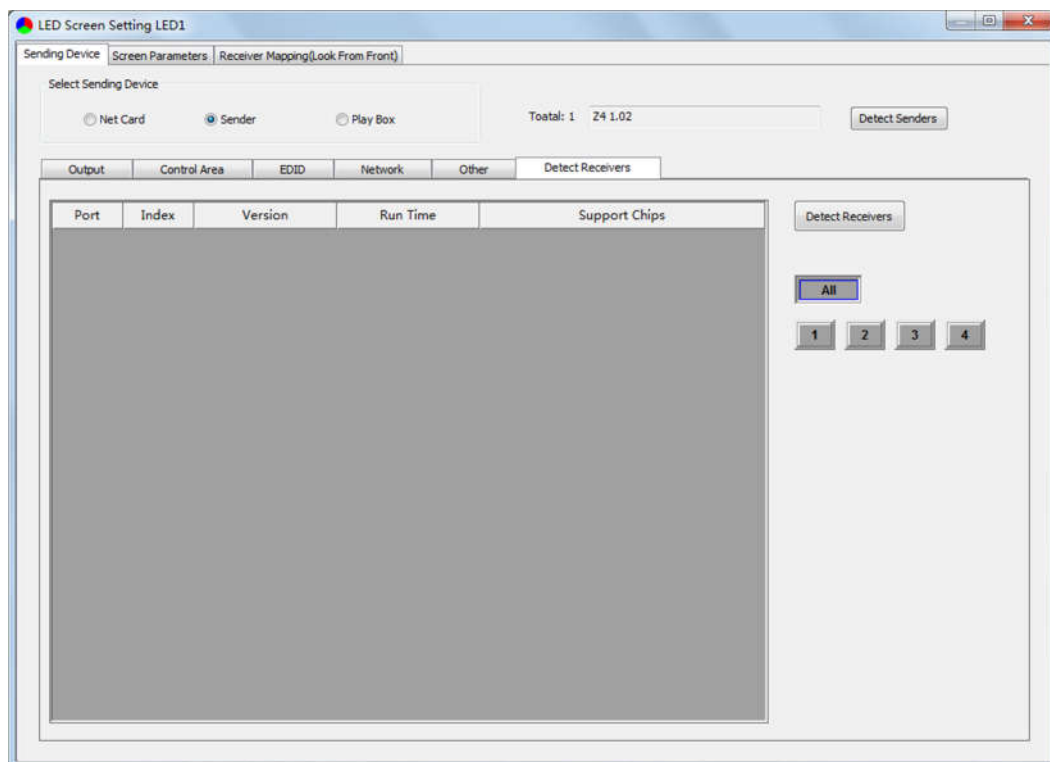
## 5.2.2 Screen Parameters Setting

Observe the display screen with single cabinet as a unit, and if all cabinets themselves could display normally {it is normal circumstance even the picture between cabinets is not continuous}, please ignore this step and directly go to the next step.

Otherwise, configuration must be done as follows:



Click **[Load]**, choose the correct parameter file.

Click **[Send]**, to send the loading parameters to the receiving cards. At the moment, each cabinet should display normally (it is normal circumstance even the picture between cabinets is not continuous), then click **[Save to Receiver]** to save the parameters to the receiving cards.

If each cabinet cannot display normally, you can conduct via the **Basic Setting** (**Module Information**, **Box Setting**, **Performance Setting**) or **Intelligent Setting**, and you can also contact with the LED screen engineers.

## 5.2.3 Connection Parameters Setting

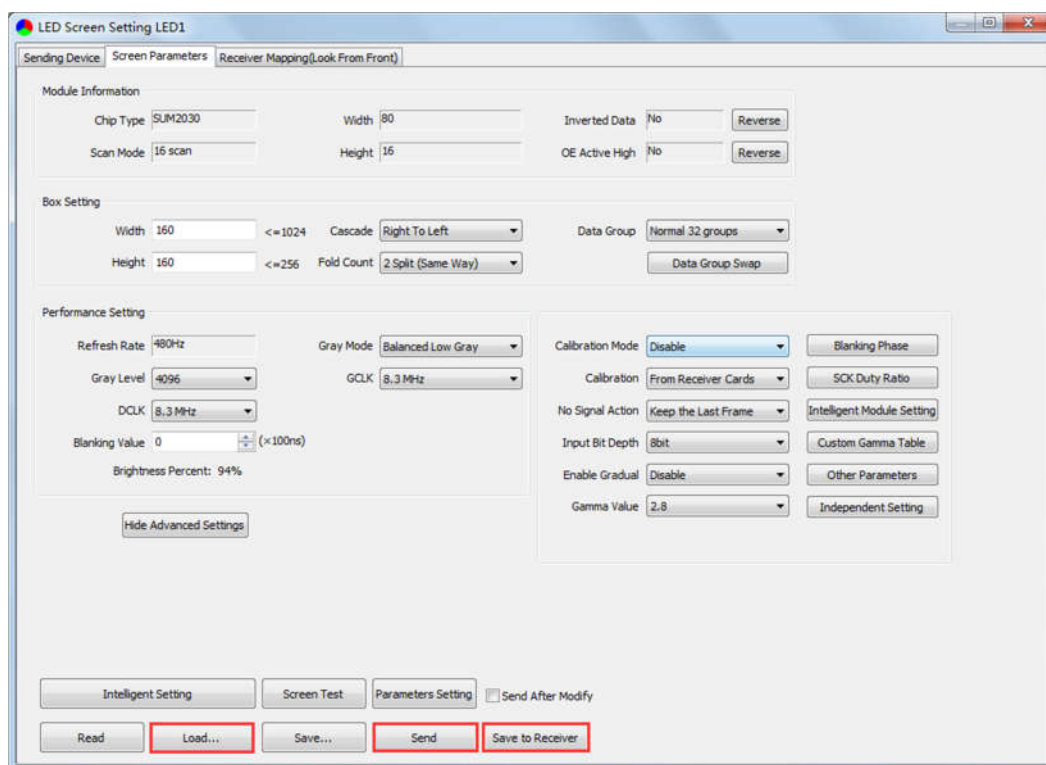Users don't need to set up the control area of each net port respectively, but to the connection relationship between the receiving cards under the network port loading via each sender, and the software will auto calculate and set up the port control area according to the connection relationship.

Detailed setting steps as follows:

**1. Set up the quantity of receiving card**

Set how many receiver (receiving card) that one port manages in Row Count and Col Count (6*6 as an example) according to the actual loading of LED display, you will see LED display mapping area from the right side (Viewing from the front of LED display).
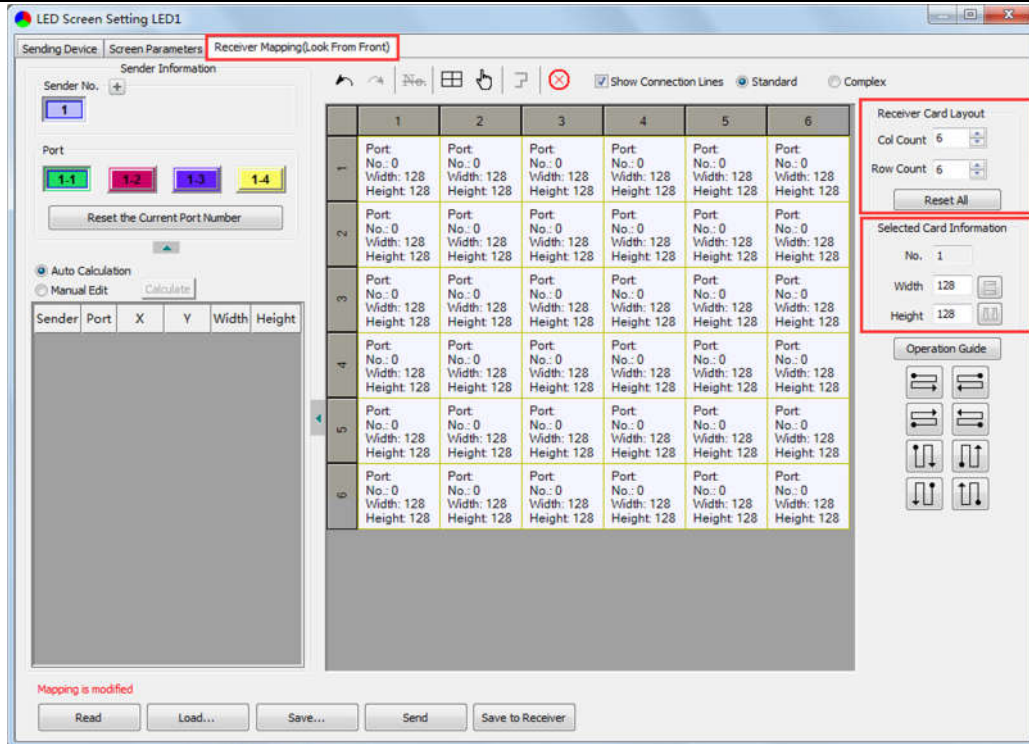
## 2. Receiving Card Parameters Setting

**Select** the target **sender** and the **net port** from the left side, then **select** the corresponding **cabinets** within net port actual control area and set the connection lines in the mapping area.

# Colorlight
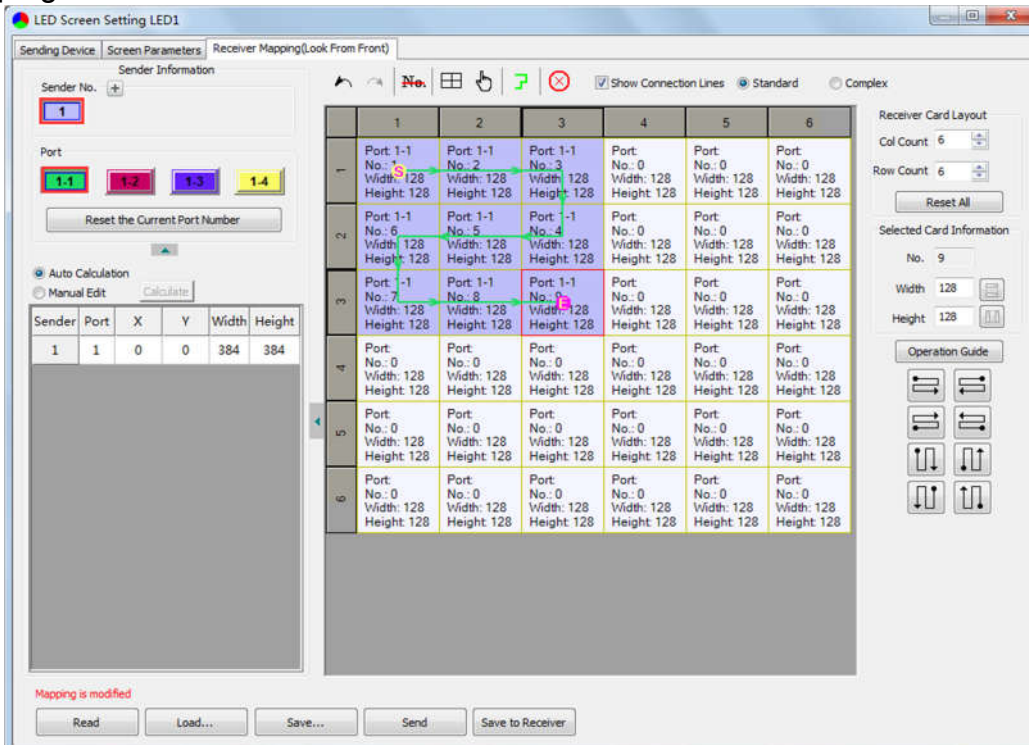
**There are two methods to set up:**

## ①Use mouse to select one by one

In the mapping area, select the first receiving card based on the actual connection of the net port (view from the front), and then set up the actual loading width and height of the target receiving card in the right side (128*128 as an example).

Click the receiver (receiving card) one by one, according to actual connecting line, until the last one for this network port loads.

## ②Connection Pattern

Aiming at the LED screen with standard connection lines, firstly set up the receiving card information according to the actual loading width and height (128*128 as an example).

Select the connection line you want from the right side, then cover the corresponding area of net port loading in mapping area, finally complete setting.

**Note:** As the cabinets have multiple and different specification (that is the inconsistent capacity of the receiving card), you can select the different one to adjust separately after completing setting.
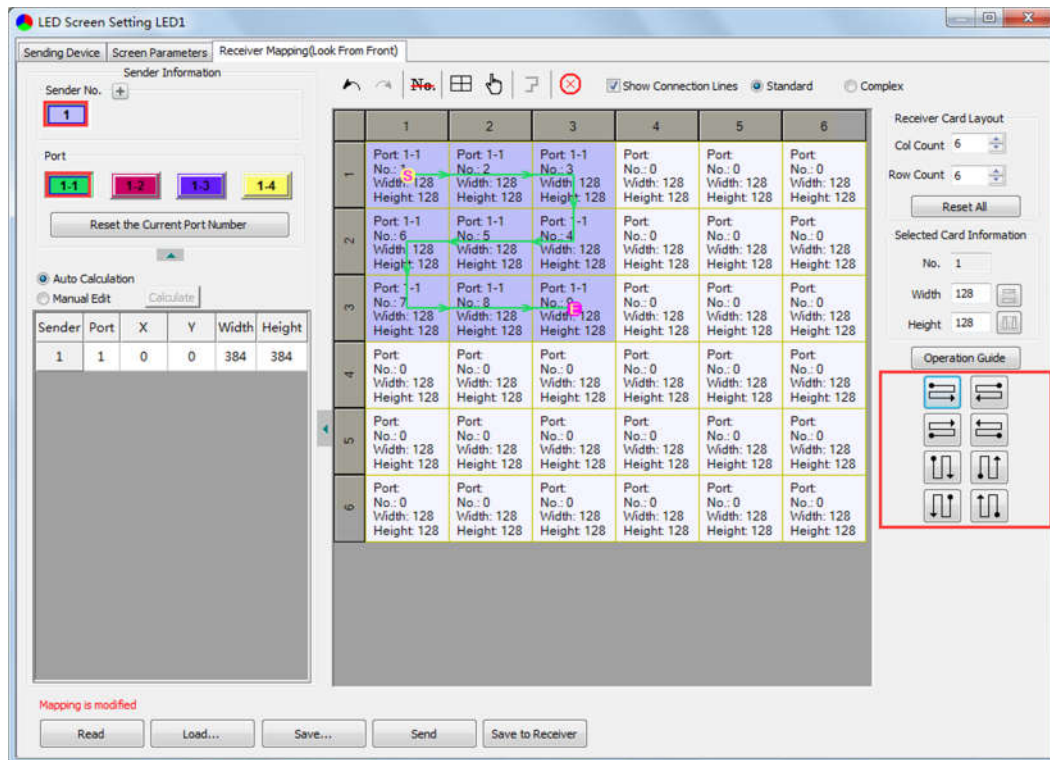
## 3. Send & Save to Receiving Card

After setting up all the receiving card parameters and connection lines respectively, click **[Send]** to send the correct parameter to the receiving card, and the screen should display normally at this time.

Then click **[Save to Receiver]** to save parameters to corresponding receiving card after confirming.
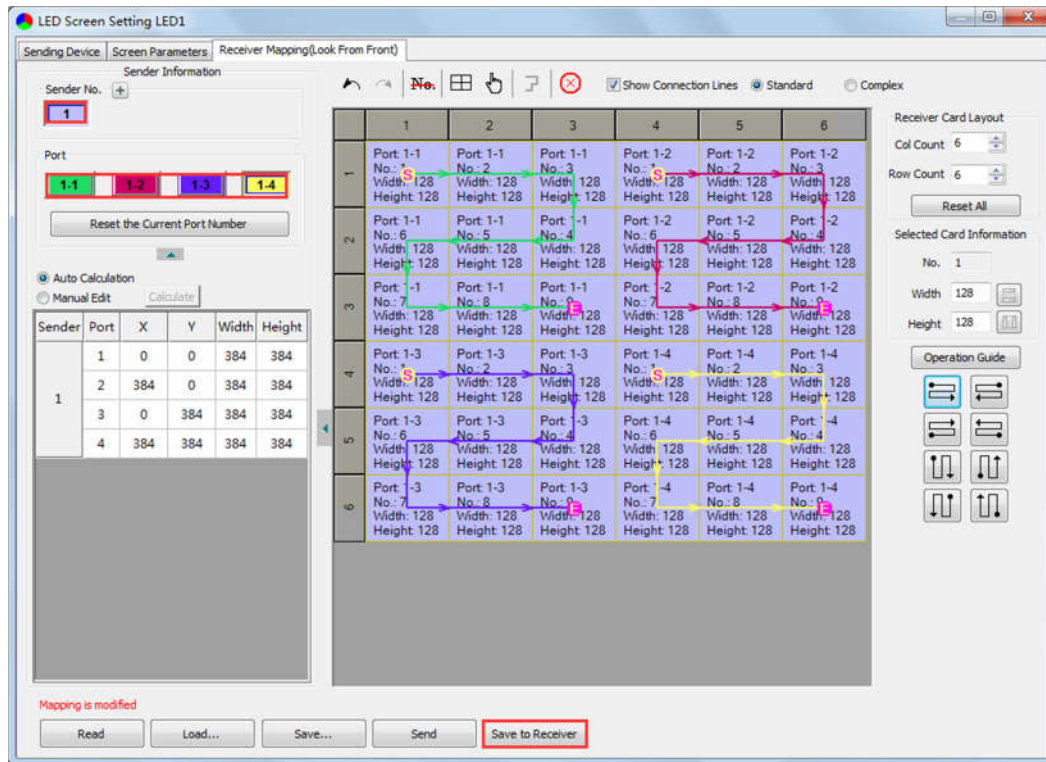
# 6 LCD Operation Instruction

## 6.1 Operational Motion Instruction

**Knob/OK:**
➢ Press the knob/OK under main interface to enter operation interface of menu.
➢ Rotate the knob to select menu or press the knob/OK under the operation interface of menu to select current menu or enter submenu.
➢ Rotate the knob to adjust parameters after selecting the menu with parameter, and it will be auto saved within one second after adjustment.

**ESC:** Return key, exit current menu or operation.

## 6.2 Main Interface

After starting Z4, main interface of LCD display is as follows:



First row: Company name.
Second row: Image resolution.
Third row: Screen brightness, Output mode.

## 6.3 Operation Instruction

Press the knob/OK to enter the operation interface of main menu, and it includes 12 operation instructions: Display Setting, EDID Setting, Cropping Setting, Output Setting, Fiber Setting, Preset Setting, Picture Adjust, Output Shift, Tile Mapping, Network Setting, Language, System Setting.

## 6.3.1 Display Setting

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

```
➡ 1, Brightness
   2, CCT
   3, Black          ⬤○
   4, Better Gray    ⬤○
   5, Test Mode
```

**1. Brightness:** Enter the adjustment interface of "Brightness", press the knob/OK to turn on/off the function of broadcast in the option of "Broadcast", and rotate the knob to change the percentage of brightness in the option of "Brightness".

```
➡ 1, Broadcast      ⬤○
   2, Brightness     100%
```

**2. CCT:** Enter the adjustment interface of "CCT", rotate the knob to change the value of color temperature in the option of "CCT", and you can also press the knob/OK to reset the value of color temperature as 6500 in the option of "Reset to Default".

```
➡ 1, CCT            6500
   2, Reset to Default
```

**3. Black:** Press the knob/OK to switch on/off LED screen.
**4. Better Gray:** Press the knob/OK to turn on/off the option of "Better Gray".
**5. Test Mode:** Enter the setting interface of "Test Mode", rotate the knob to select test mode, press ESC back to normal mode.

| | | |
|---|---|---|
| ➡ 1, Normal | ➡ 7, Horizontal Line | ➡ 13, Gradient Blue |
| 2, Red | 8, Left Slash | 14, Gradient White |
| 3, Green | 9, Right Slash | 15, Black |
| 4, Blue | 10, Pane | |
| 5, White | 11, Gradient Red | |
| 6, Vertical Line | 12, Gradient Green | |

## 6.3.2 EDID Setting

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

➡ 1, HDMI
2, DVI
3, DP

Enter the EDID setting interface of "HDMI" or "DVI" or "DP". Rotate the knob to select conventional resolution; or set width, height and frame rate by knob in the option of "Custom".

| | | |
|---|---|---|
| ➡ 1, 1920×1200 ✓ | ➡ 7, 800×600 | ➡ 1, Width   1920 |
| 2, 1920×1080 | 8, Custom | 2, Height  1080 |
| 3, 2048×1024 | | 3, Frame Rate  60 |
| 4, 1600×900 | | 4, Save |
| 5, 1280×1024 | | |
| 6, 1024×768 | | |

## 6.3.3 Cropping Setting

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

➡ 1, HDMI
2, DVI
3, SDI1
4, SDI2
5, DP

Enter the cropping interface of "HDMI" or "DVI" or "SDI1" or "SDI2" or "DP", press the

knob/OK to turn on/off crop. If it has been enabled, set X, Y, width and height of input signal by knob then save the data.

```
→ 1, Enable          ⬤
  2, X                0
  3, Y                0
  4, Width          200
  5, Height         200
  6, Save
```

## 6.3.4 Output Setting

Rotate the knob to select output setting, then press the knob/OK to enter submenu of "Output Setting"; Continue rotating the knob to select "Main" or "PIP1" or "PIP2", press the knob/OK to enter the output setting interface. Rotate the knob to adjust X, Y, width and height of output, then save it.

```
→ 1, Main               → 1, X                0
  2, PIP1                 2, Y                0
  3, PIP2                 3, Width         1920
                          4, Height        1080
                          5, Save
```

## 6.3.5 Fiber Setting

Rotate the knob to select fiber setting, then press the knob/OK to enter submenu of "Fiber Setting". In the submenu, output mode defaults to cable output, users can press the knob/OK to switch output mode, that is, the output mode is switched to fiber output.
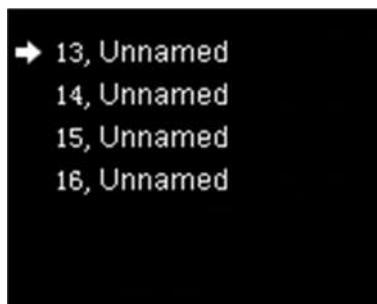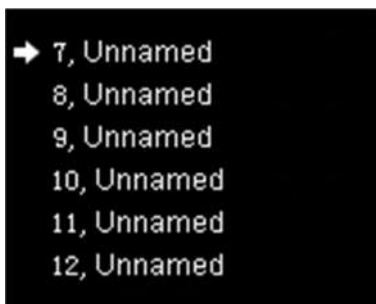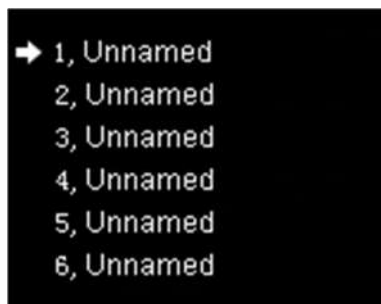
```
→ 1, Fiber / Cable   ⊙      → 1, Fiber / Cable   ⬤
  Output Mode:                 Output Mode:
      By Cable                     By Fiber
```
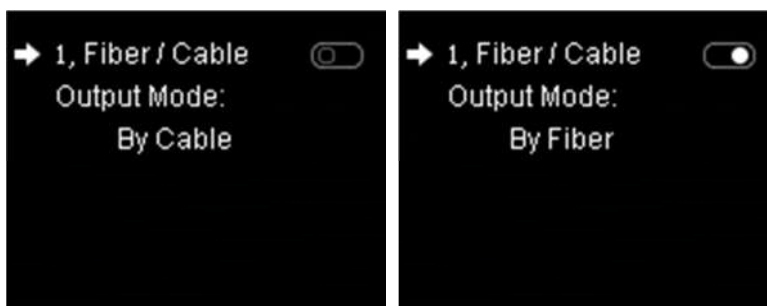
## 6.3.6 Preset Setting

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

```
➡ 1, Load Preset
   2, Save to Preset
```
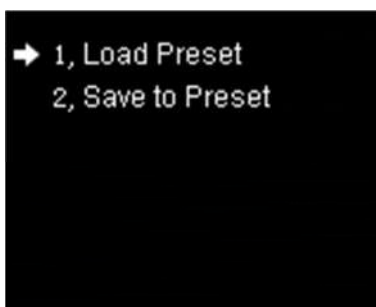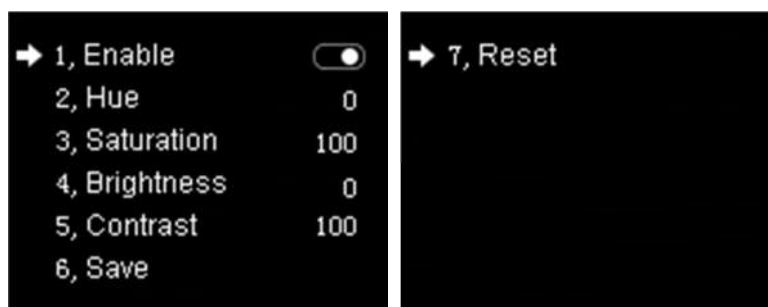
In the submenu, 16 preset parameters can be saved, and every preset parameter includes all parameter information of image output (signal source, PIP, scaling, clipping, picture adjustment), users can also directly load the saved preset parameter to display the image according to needs, and don't need to set up all parameters again.

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

## 6.3.7 Picture Adjust

Rotate the knob to select picture adjustment, then press the knob/OK to enter submenu of "Picture Adjust". In the submenu, press the knob/OK to turn on/off "Enable". If "Enable" has been turned on, users can set hue, saturation, brightness and contrast of image by knob then save the data; and users can also restore the default values of every parameter, that is, hue and brightness default to 0, saturation and contrast default to 100.
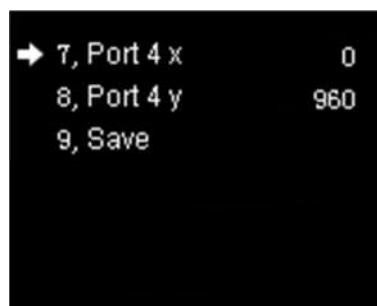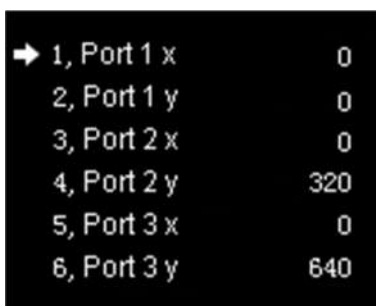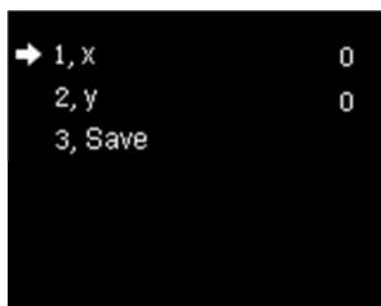
```
➡ 1, Enable        ⬤⬤       ➡ 7, Reset
   2, Hue              0
   3, Saturation     100
   4, Brightness       0
   5, Contrast       100
   6, Save
```

## 6.3.8 Output Shift

Rotate the knob to select output shift, then press the knob/OK to enter submenu of "Output Shift".
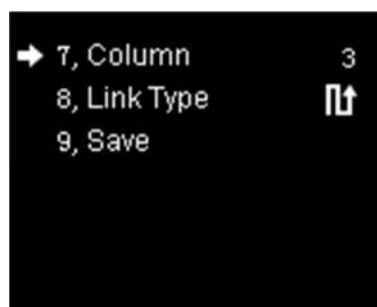
```
➡ 1, Whole
   2, By Port
```

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

```
➡ 1, x          0        ➡ 1, Port 1 x      0        ➡ 7, Port 4 x      0
   2, y          0           2, Port 1 y      0           8, Port 4 y    960
   3, Save                   3, Port 2 x      0           9, Save
                             4, Port 2 y    320
                             5, Port 3 x      0
                             6, Port 3 y    640
```

## 6.3.9 Tile Mapping

Rotate the knob to select tile mapping, then press the knob/OK to enter submenu of "Tile Mapping". 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 which need to be set and set offset values of X and Y, also, you can set the width, height, row, column and link type of corresponding cabinets, then save all the parameters.

```
➡ 1, From Sender  ⚪    ➡ 1, Port           1      ➡ 7, Column         3
   2, Set By Port         2, Y Offset       0           8, Link Type    ⬆⬇
                          3, X Offset       0           9, Save
                          4, Tile Width   128
                          5, Tile Height  128
                          6, Row            3
```

## 6.3.10 Others

**Network Setting:** Users can automatically obtain an IP address or set manually. Enter the setting interface of "Network Setting", press the knob/OK to turn on/off DHCP; or press the knob/OK to enter manual IP setting, you can set up IP, subnet and gateway respectively

via the knob.
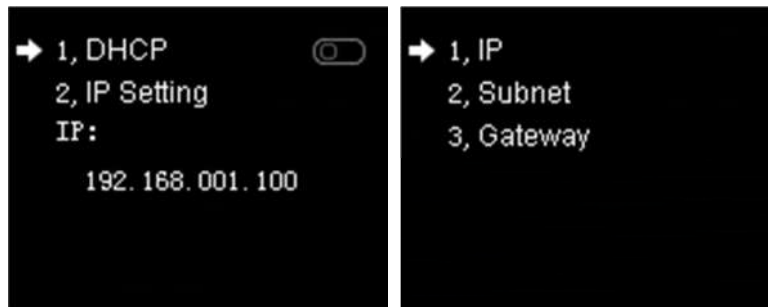


**Language:** Enter the setting interface of "Language", press the knob/OK to switch the language.



**System Setting:** In "System Setting", users can set date and time, restore factory settings and check current firmware information.