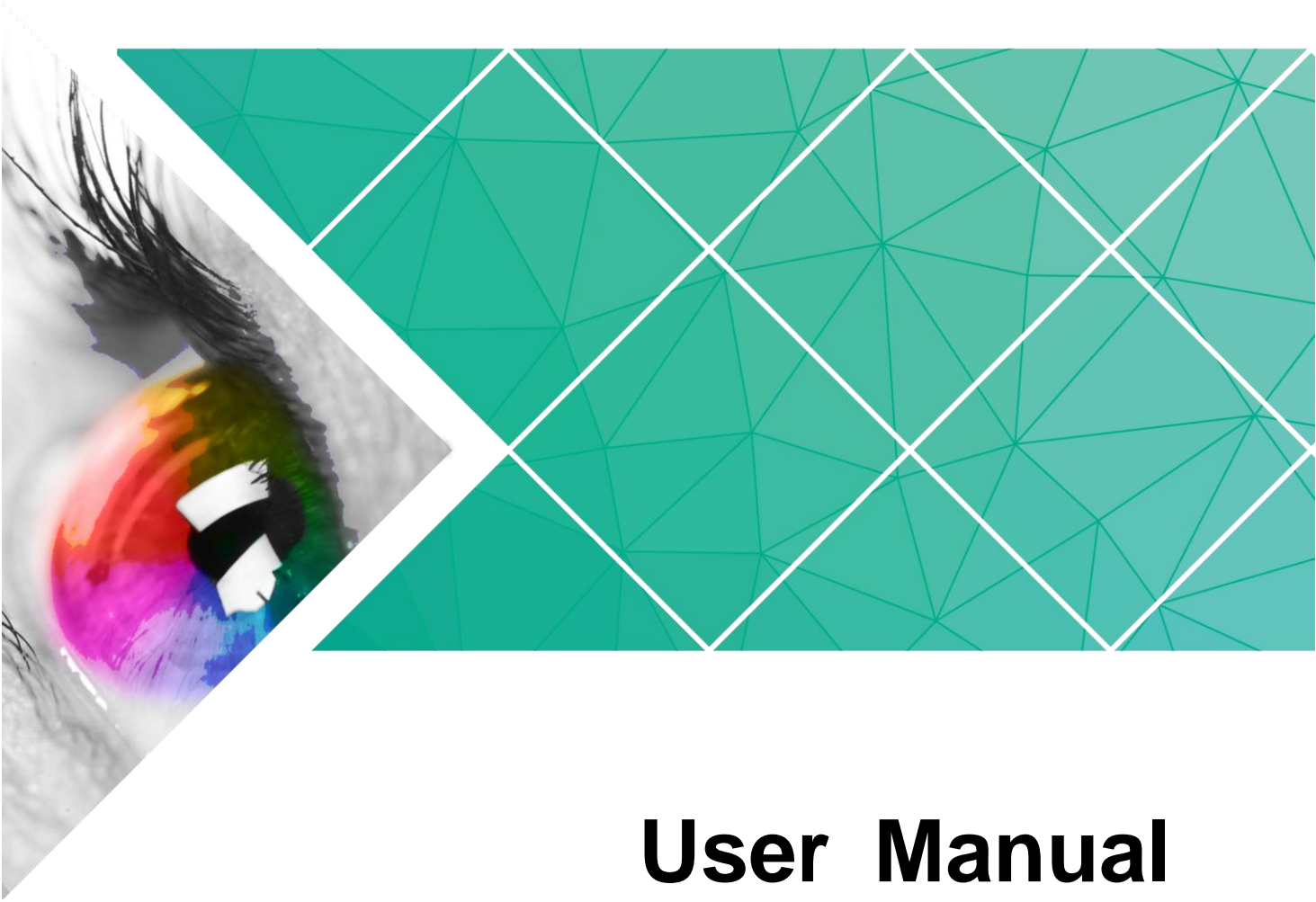


Thunderview_V1

Video Processor




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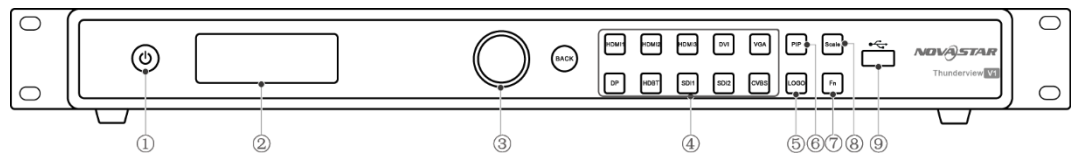
1 Overview

The Thunderview_V1 is a video processor developed by NovaStar based on the powerful FPGA processing platform. It is designed with various signal inputs, including 2 SDI, 1 DP, 1 CVBS, 1 VGA, 3 HDMI, 1 DVI, 1 HDBT and 1 S/PDIF. It supports input resolutions up to 4096x2160@60Hz and UHD input and output displays. With low latency and a fast signal source switch within 0.25 second, it can give you a faster operation experience.

2 Hardware

2.1 Front Panel

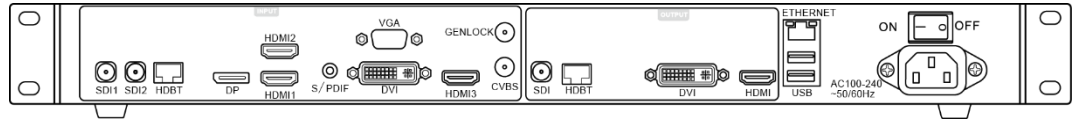
Figure 2-1 Front panel



- ① Power button
- ② LCD panel
- ③ Press the knob to display the main menu or confirm an option or operation.
- ④ Shortcut keys of input source selection: Corresponds to the input source ports on the rear panel.
- ⑤ To load the .png file; after the Thunderview_V1 is connected to the upper computer through the Ethernet cable, it is required to visit 192.168.0.111 to configure the IP.
- ⑥ To display the PIP menu screen
- ⑦ Custom button: Users can set it to be the blackout, freeze or test function.
- ⑧ To display the scaling menu screen
- ⑨ USB: For MCU upgrade

2.2 Rear Panel

Figure 2-2 Rear panel



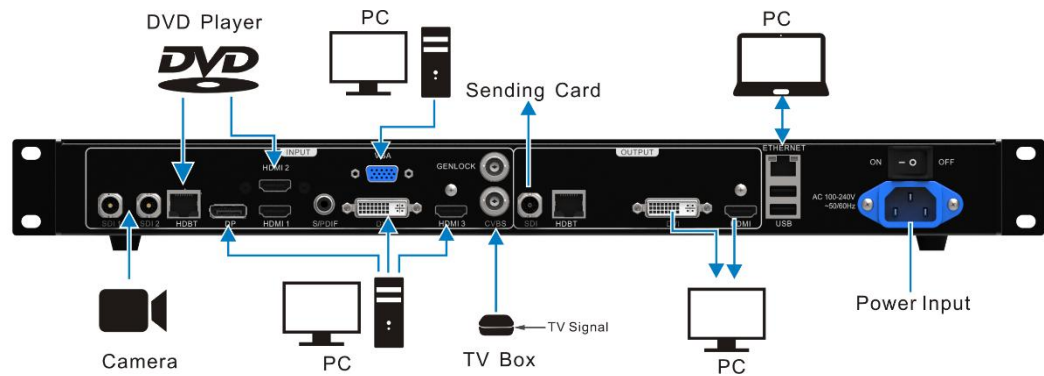
Input Source	Quantity	Function
SDI	2	SDI video source input
DP	1	DP video source input
HDMI	3	HDMI video source input
S/PDIF	1	External independent audio input
VGA	1	VGA video source input
DVI	1	DVI video source input
CVBS	1	CVBS video source input
GENLOCK	1	GENLOCK signal source input
HDBT	1	HDBT video source input
Output Source	Quantity	Function
SDI	1	SDI video source output
DVI	1	DVI video source output
HDMI	1	HDMI video source output
HDBT	1	HDBT video source output
Ethernet	Quantity	Function
RJ45	1	Ethernet port: Connects to the upper computer.
USB	2	FPGA firmware update
Power		
AC 100-240V, 50/60HZ		AC power input
ON/OFF		Power switch

3 Applications

Note:

Before connecting other devices to the Thunderview_V1, please power off the Thunderview_V1 first.

Figure 3-1 Application



4 Operations

Operation instructions

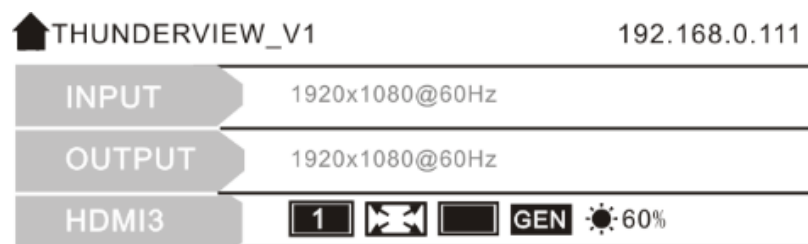
Knob:

1. On the home screen, press the knob to enter the main menu.
2. On the main menu, rotate the knob to select a menu item. Then, press the knob to confirm the current selected item or to enter the submenu.
3. When a menu item with parameters is selected, you can rotate the knob to adjust the parameters. Please note that after adjustment, you need to press the knob again to confirm the adjustment.






BACK button: A return key, used to exit the current menu or operation

4.1 Home Screen

After the Thunderview_V1 is turned on, the home screen is shown as below.



- **INPUT:** Input source resolution
- **OUTPUT:** Output source resolution
- **HDMI3:** Currently used input source
- PIP
 - : PIP enabled
 - : PIP disabled
- Scaling
 - : Scaling function enabled
 - : Scaling function disabled

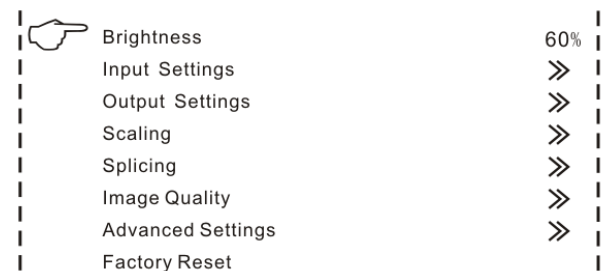
- Splicing
 - : Splicing mode enabled
 - : Splicing mode disabled
- Genlock
 - : Genlock enabled
 - : Genlock disabled
- Brightness
 -  60%: Current output display brightness

4.2 Main Menu

On the home screen, press the knob to enter the main menu. On the main menu, rotate the knob to select a menu item. Then, press the knob to confirm the current selected item or to enter the submenu, or press the **BACK** button to go back to the previous screen.

Functions on the main menu: **Brightness, Input Settings, Output Settings, Scaling, PIP, Splicing, Image Quality, Advanced Settings, and Factory Reset**

Figure 4-1 Main menu



4.3 Brightness

Set the output display brightness which ranges from 0 to 100 and defaults to 50.

4.4 Input Settings

Input settings include selecting an input source and setting the EDID of the input source.

Figure 4-2 Input settings



- **Input Source:** 3G-SDI1, 3G-SDI2, DP, HDMI1, HDMI2, DVI, VGA, CVBS, HDMI3, LOGO, HDBT, TESTPAT
- **Preset Resolution:** 640x480p, 720x480i, 720x480p, 720x576i, 720x576p, 800x600p, 1024x768p, 1080x1920p, 1280x720p, 1280x768p, 1280x800p, 1280x1024p, 1360x768p, 1366x768p, 1400x1050p, 1440x900p, 1600x1200p, 1680x1050p, 1920x1080i, 1920x1080p, 1920x1200p, 2048x1080p, 2048x1200p, 2560x1080p, 2560x1440p, 3560x1600p, 3840x2160p, 4096x2160p
- **Preset Rate:** 60Hz, 59.94Hz, 50Hz, 48Hz, 30Hz, 29.97Hz, 25Hz, 24Hz, 23.98Hz

Note:

The logo cannot be loaded through the Thunderview_V1. To load it, perform the following steps.

1. Connect the Thunderview_V1 to a PC properly by using an Ethernet cable.
2. Ensure that the IP addresses of the PC and the Thunderview_V1 are in the same network segment.
3. Type the IP address of the Thunderview_V1 (<http://192.168.0.111>) in the browser's address box and enter the web control page.
4. Click **LOGO** in the **Inputs** menu and then click **Backup/Restore**.
5. Click **Select file** in the **Restore settings from files** bar. After selection, click **Restore**.

4.5 Output Settings

Output settings include setting the resolution and refresh rate of the output source, the aspect ratio and the synchronization mode of the output display.

Figure 4-3 Output settings



- **Output Resolution:** 720x576p, 800x600p, 1024x768p, 1080x1920p, 1280x720p, 1280x768p, 1280x800p, 1280x1024p, 1360x768p, 1366x768p, 1400x1050p, 1440x900p, 1600x1200p, 1680x1050p, 1920x1080i, 1920x1080p,

- 1920x1200p, 2048x1080p, 2048x1200p, 2560x1080p, 2560x1440p, 3560x1600p, 3840x2160p, 4096x2160p
- **Output Rate:** 60Hz, 59.94Hz, 50Hz, 48Hz, 30Hz, 29.97Hz, 25Hz, 24Hz, 23.98Hz
 - **Aspect Ratio:** Original, Full Screen, Crop, Anamorphic
 - **Original:** The input image is scaled to completely fit the display area either horizontally or vertically without any distortion. The input aspect ratio is preserved and unused areas on the top/bottom or left/right are set black.
 - **Full Screen:** The input image is scaled to completely fit the display area without preserving the aspect ratio of the source. This will cause distortion but no black areas will be visible.
 - **Crop:** The input image is scaled to completely fit the display area while preserving the aspect ratio of the source. Portions of the input image on the top/bottom or left/right will be cropped out of the output image.
 - **Anamorphic:** The image will be treated as in crop, but it is always scaled to a 16:9 aspect ratio.
 - **IO Lock:** Lock the output displays to be synchronous
 - **Off:** Disable the synchronous mode.
 - **Source:** Use an input source as the synchronization signal.
 - **Genlock:** Use an external Genlock source as the synchronization signal.

4.6 Scaling

Set the scaling of output display, including the dimensions and position of the scaled display.

Figure 4-4 Scaling

Scaling	Enable
Scale Value	Percentage
Aspect Lock	Disable
Zoom H	1920%
Zoom V	1080%
H Offset	0
V Offset	0
Scale Reset	>>

- **Scaling:** Enable or disable the scaling function.
- **Scale Value:** Unit of scaling, which is pixel or percentage
- **Aspect Lock:** Enable or disable the aspect lock function
- **Zoom H:** Horizontal width of the scaled display
- **Zoom V:** Vertical height of the scaled display
- **H Offset:** Horizontal position offset
- **V Offset:** Vertical position offset
- **Scale Reset:** Reset the parameters of scaling.

4.7 PIP

Set the input source, dimensions and position of PIP.

Figure 4-5 PIP

	PIP	Enable
	Layout	L+T
	Main Source	>>
	PIP Source	>>
	Width(H)	160
	Height(V)	90
	Start X	0
	Start Y	0

- **PIP:** Enable or disable the PIP function.
- **Layout:** Choose the position of the PIP.
 - **R+B:** PIP at the bottom right of the main window
 - **R+T:** PIP at the top right of the main window
 - **L+B:** PIP at the bottom left of the main window
 - **L+T:** PIP at the top left of the main window
 - **Custom:** Customize the position of the PIP in the main window by adjusting the **Start X** and **Start Y** parameters to move the position.
- **Main Source:** Choose the input source of the main window.
- **PIP Source:** Choose the input source of the PIP.
- **Width(W):** Horizontal width of the PIP
- **Height(H):** Vertical height of the PIP
- **Start X:** Starting position of the PIP at the horizontal direction
- **Start Y:** Starting position of the PIP at the vertical direction

4.8 Splicing

Set the splicing mode and parameters.

Figure 4-6 Splicing

	Splicing Zoom	Enable
	Splicing Width	0
	Splicing Height	0
	H-Position	0
	V-Position	0
	Advanced Settings	>>

- **Splicing Zoom:** Enable or disable the splicing function.
- **Splicing Width:** Number of screens that are horizontally spliced together
- **Splicing Height:** Number of screens that are vertically spliced together

- **H-Position:** Horizontal position on the whole screen of the spliced screen loaded by current device
- **V-Position:** Vertical position on the whole screen of the spliced screen loaded by current device
- **Advanced Settings**
 - **Advanced Enable:** Enable or disable the advanced settings.
 - **Start X:** Horizontal starting coordinate of the spliced screen loaded by current device
 - **Start Y:** Vertical starting coordinate of the spliced screen loaded by current device
 - **Wall Width:** Total pixels of the spliced displays at the horizontal direction; ensure that the total pixels of the spliced displays must be the same as the screen size.
 - **Wall Height:** Total pixels of the spliced displays at the vertical direction; ensure that the total pixels of the spliced displays must be the same as the screen size.

Figure 4-7 Splicing mode: 2x2

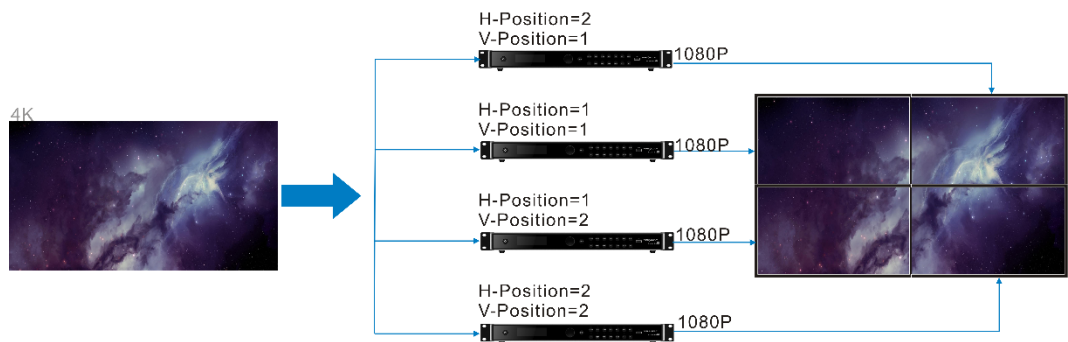


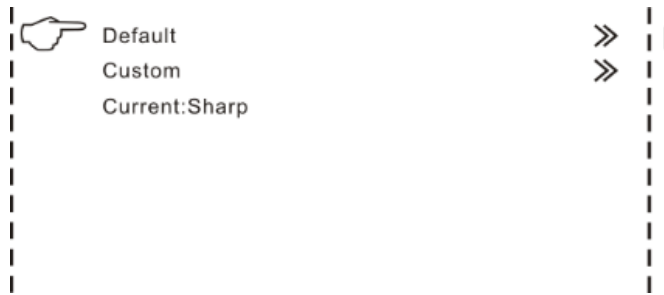
Table 4-1 Explanation by example (Device: H-Position=2, V-Position=1)

Splicing Zoom: Enable	
Splicing Width: 2	Splicing Height: 2
H-Position: 2	V-Position: 1
Advanced Enable: Enable	
Start X: 1920	Start Y: 0
Wall Width: 3840	Wall Height: 2160

4.9 Image Quality

The Thunderview_V1 is designed with five modes of image quality. Users can also customize templates under the **Custom** menu item and save them.

Figure 4-8 Image quality



- **Default:** Five pre-stored modes of image quality in the Thunderview_V1
 - **Standard:** Parameters such as **Contrast**, **Saturation** and **Sharpness** have default values. This mode is applicable in the operating environment that has normal light.
 - **Sharp:** Parameters such as **Contrast**, **Saturation** and **Sharpness** have greater values than those parameters in the **Soft** mode. The **Sharpness** parameter in this mode has the greatest value among the five modes.
 - **Soft:** Parameters such as **Contrast** and **Sharpness** have the same values as those in the **Standard** mode. The **Saturation** parameter in this mode has greater value than that in the **Standard** mode.
 - **Outdoor:** Parameters such as **Contrast** and **Saturation** have greater values than those parameters in the **Indoor** mode. This mode is applicable in the operating environment that has brighter light.
 - **Indoor:** Parameters such as **Contrast** and **Saturation** have smaller values than those parameters in the **Outdoor** mode. This mode is applicable in the operating environment that has darker light.
- **Custom:** Customize templates which have four templates in total.
- **Current:** Display the name of current mode.

Note:

To modify a template, enter the **Template Para** menu item and select a target template. Then, press the knob to enter the screen of contrast, saturation and hue adjustment.

4.10 Advanced Settings

Note:

To exit the test pattern, you need to switch input sources.

Figure 4-9 Advanced settings

Display Control	>>
Audio Settings	>>
Fn Settings	>>
Network Settings	>>
OLED Brightness	15
Go Homepage(s)	30
Hardware Version	V1. 0. 0. 5
Software Version	V1. 00. 00

- **Display Control:** It controls the output display, including **Normal**, **Black Out**, **Freeze**, **Test Pattern** and **Switching Effect**.
 - **Normal:** The screen normally displays the input contents.
 - **Black Out:** The display is blackout.
 - **Freeze:** Freeze the current frame.
 - **Test Pattern:** Enter the test operation menu.
 - **Switching Effect:** Set the effects of switching sources, including **Fast Fade**, **Slow Fade** and **Freeze Fade**.
- **Audio Settings:** Audio settings, including setting audio delay, volume and mode.
 - **Audio Delay:** Audio delay time, ranging from 1 ms to 600 ms
 - **Volume:** Audio volume, ranging from 0% to 100%
 - **Audio Mode:** Audio mode, including mono and stereo
- **Fn Settings:** Custom button, including the following three functions
 - **Black Out:** The display is blackout.
 - **Freeze:** Freeze the current frame.
 - **Test:** Display the test pattern menu.
- **Network Settings:** Includes setting IP and subnet mask.
 - **Config IPV4:** Configure IP manually or automatically.
 - **Reset:** Reset the network configuration parameters.
- **OLED Brightness:** Adjust the brightness of the OLED front panel, which ranges from 4 to 15.
- **Go Homepage(s):** A period of time during which the system stops at the current screen and then automatically returns to the home screen when there is no operation performed, which ranges from 29 seconds to 120 seconds and defaults to 30 seconds.
- **Hardware Version:** View the hardware version of the Thunderview_V1.
- **Software Version:** View the version of the web control page of the upper computer.

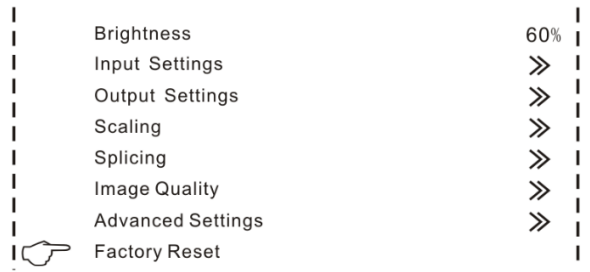
Note:

The IP address of Thunderview_V1 is a fixed one and it cannot be changed.

4.11 Factory Reset

Clear all setting data set by the users and reset the Thunderview_V1 to factory default settings.

Figure 4-10 Factory reset



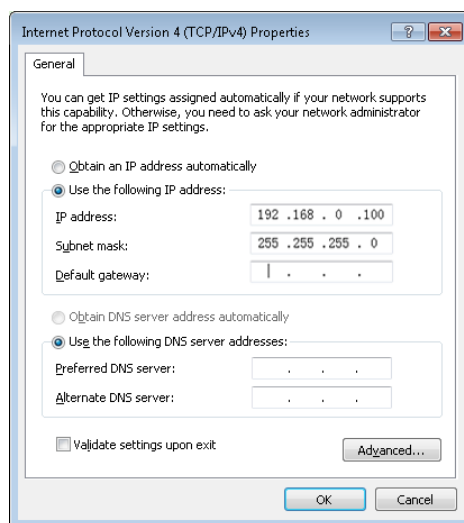
5 Web Control

Web control can be performed on a PC or on any mobile phone. No software is required to be installed on the PC. Through web control, all operations that can be performed on the Thunderview_V1 can be performed, including input setting, system setting, audio setting and firmware update.

Network Connection

- Step 1 Connect the Thunderview_V1 to a PC properly by using an Ethernet cable.
- Step 2 Change the IP address of the PC to a static one and type the actual IP address in the corresponding input box. Ensure that the IP addresses of the PC and the Thunderview_V1 are in the same network segment.

Figure 5-1 Change IP address



- Step 3 Type the IP address of the Thunderview_V1 (<http://192.168.0.111>) in the browser's address box and enter the web control page.

Web Control

The web control page is as shown in Figure 5-2. In the top area, **Unit ID**, **Version**, and **Input Resolution** indicate the ID, version and input resolution of current device, respectively. The main menu of the web control page includes the **Inputs** and **Main Menu** areas. In the **Inputs** area, you can switch the input sources. In the **Main Menu** area, you can set input sources, output source and other functions.

Figure 5-2 Main menu

