Hanshow Shelf Edge Digital Signage HS-AT2311
Product Manual

V1.0.0

HS-SIGNAGE-AT2311001

STATEMENT

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Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This product is designed to be used indoors. The distance between user and device should be no less than 20cm.

ABOUT THE DOCUMENT

The manual mainly introduces functions, structure, hardware parameters, performance, installation, and precautions for shelf edge digital signage HS-AT2311.

Thank you very much for shelf edge digital signage HS-AT2311.

Please read the product manual carefully before using this product, retain the document for subsequent use or for the next owner. If the instructions contained in this manual are insufficient to resolve issues that occur during device operation or maintenance, please contact Hanshow Technical Customer Service Center (400-0365-305) directly, we will provide you with multi-channel technical services.

TARGET USERS

This document provides engineers with necessary data and related guidelines. Users must master the basic knowledge on communication, DSP, and ARM. This document is applicable to:

- Testing engineers
- Technical support engineers
- Service engineers

SYMBOL DESCRIPTION

Icon	Description
⚠	Information indicated with this icon should be paid special attention to by the reader
🕮	Information indicated with this icon is the explanation on the formal text for the readers to comprehend the text better
[X-X]	It means special noun definition is provided here

EXPLANATION OF TERMS

Term	Expanded form	Description
LAN	Local Area Network	Local Area Network
LCD	Liquid Crystal Display	Liquid Crystal Display
RF	Radio Frequency	Radio Frequency
RS232	EIA-RS-232	EIA-RS-232
USB	Universal Serial Bus	Universal Serial Bus
Wi-Fi	Wireless Fidelity	Wireless Fidelity

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1 Overview

HS-AT2311 is the first-generation shelf edge digital signage independently developed by Hanshow. With its high integration, HS-AT2311 meets the requirements for higher performance, nice appearance, shelf match, appropriate space, and low power consumption of shelf edge digital signage; thus providing users with better marketing business experience.

HS-AT2311 can access the Internet by Wi-Fi connection in 2.4G/5G wireless frequency band, or access 100M Ethernet by cable connection from a Type-C to RJ45 port, performing data transmission and information interaction with the backend cloud server. Equipped with a high-performance quad-core 64-bit ARM Cortex-A53 processor, and integrated with multi-functional modules such as Wi-Fi, 100M-PHY, and Video Codec, HS-AT2311 is Hanshow's multi-service product developed for digital shelf and marketing services.

1.1 System structure

The shelf edge digital signage system consists of shelf edge digital signage, Wi-Fi, and cloud data center (server). Shelf edge digital signage displays the data transmitted from the data center server, such as advertising videos and ESL information. The system structure is shown in *Figure 1-1*.

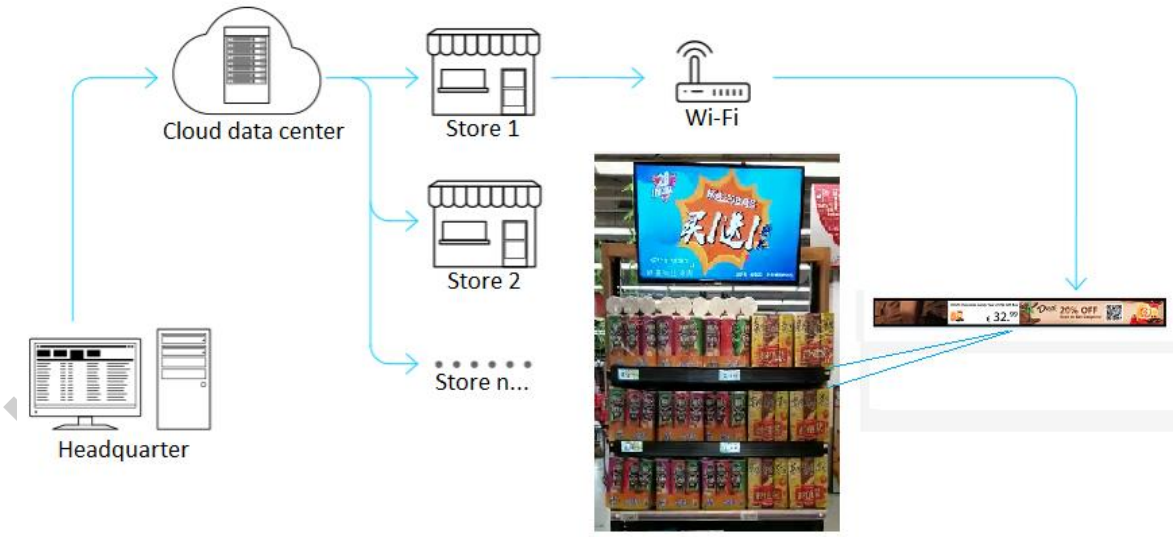

Figure 1-1 Shelf edge digital signage system structure

1.2 Performance

HS-AT2311 is an important component of Hanshow digital shelf and marketing system. As a terminal display device, it is responsible for displaying the data transmitted from the data center server. Connected with the digital marketing system through wireless network interface (Wi-Fi), HS-AT2311 establishes two-way 2.4G/5GHz wireless communication with Wi-Fi.

- Downlink: HS-AT2311 receives Wi-Fi downlink packets and displays the data transmitted from the data center server, such as advertising videos and ESL information.
- Uplink: HS-AT2311 reports the collected sensor data to the cloud server.

Table 1-1 shows the basic configuration information of HS-AT2311.

Table 1-1 HS-AT2311 basic configuration

Name	Description
Operating system	Android 7.0, responsible for data interaction with Wi-Fi, including registration of shelf edge digital signage, sensor data collection and processing, and data transmission. Supports online upgrade.
RF system	Supports Wi-Fi 2.4G/5GHz communication to ensure high data transmission rate and improve channel utilization.
Memory	1GB DDR4 + 8GMB eMMC
Wi-Fi	2.4G/5G dual frequency, in accordance with IEEE 802.11ac/a/b/g/n standards, time-sharing
Bluetooth (optional)	Bluetooth V4.1 (1/2/3Mbps)
Audio port	Dual channel 3W speaker
Power supply	DC12V-2A power adapter
Management configuration	Web configuration mode
LCD	23.1-inch shelf edge digital signage with 1920*158 resolution
Serial port	In accordance with RS232 protocol. The serial port extended from Type-C port can support debugging.
External USB	USB1 (Extend from Type C for U disk upgrade) USB2 (Compatible with existing structure, mouse extension, U disk upgrade)
Ethernet port	Standard 100M Ethernet RJ45 port extended from Type-C port

Name	Description
Media playback	Video format: MPEG-1, MPEG-2, MPEG-4, H.263, H.264, VC1, RV, and other video formats Up to 1080p Image format: JPG, BMP, PNG, GIF and other image formats Rotate/slide show Up to 4096*4096

1.3 Functions

HS-AT2311 supports the following functions:

- Price display
- Promotion management
- Advertising management
- Advertising content management
- Precision marketing
- Split screen display
- Multi-screen splicing
- Scheduled distribution
- Multiple content formats
- 12V safe voltage
- Bracket customization

2 Hardware features

This chapter describes specifications, physical interfaces, nameplate information, and appearance parameters of HS-AT2311.

2.1 Specifications

Table 2-1 describes HS-AT2311 specifications.

Table 2-1 HS-AT2311 specifications

Power module	
Input voltage	DC 12V
Maximum current	2A
Rated current	0.92A
Rated power	11W
Other	Overload/overvoltage/overheat protection
Main configuration	
CPU frequency	2.0GHz quad-core 64-bit high-performance Cortex-A53 processor
Memory	1GB DDR4 + 8GB eMMC
Operating system	Android 7.0
Wi-Fi RF module (2.4G/5G module)	
Working frequency	2400MHz ~ 2483.5MHz, 5150MHz ~ 5850MHz
Channel bandwidth	20/40/80MHz
Modulation mode	DBPSK/DQPSK/CCK(DSSS)/BPSK/QPSK/16QAM/64QAM(OFDM)/256-QAM
Maximum transmission rate	433Mbps
Transmit power	10dBm, 11dBm, 12dBm, 13dBm, 14dBm, 15dBm, 16dBm
Antenna gain	2.5 ± 0.5dbi (optional)
Antenna performance	1-way omnidirectional board antenna

Ultra-high sensitivity	＜-70dBm
Ethernet module	
Connection rate	10/100M (adaptive)
Auto-negotiation	Supported
Polarity adaptation	Supported
DHCP	Supported
Bluetooth module	
Working frequency	2402MHz ~ 2480MHz
Channel bandwidth	＜20M
Modulation mode	FHSS/GFSK/DPSK/DQPSK
Transmission rate	1M/2M/3M
Transmit power	8dBm adjustable
Antenna gain	2.5 ± 0.5dBi (optional)
Antenna performance	1-way omnidirectional board antenna
Ultra-high sensitivity	-85dBm
USB	
Voltage and current	5V voltage, 500mA current
Transmission rate	480Mbps (USB2.0)
Power consumption	
Idle power consumption	12V voltage, 1A current
Maximum power consumption	12V voltage, 2A current
Temperature	
Working temperature	-10℃ ~ 50℃
Storage temperature	-40℃ ~ 70℃

Display	
LCD	23.1-inch HD shelf edge digital signage
Resolution	1920*158
Viewable area	585.6mm (H) * 48.19mm (V)
Viewing angle	89/89/89/89
Display mode	Normally black IPS
Contrast	3000:1
Brightness	400nit

2.2 Physical interfaces

HS-AT2311 physical interfaces are as shown in *Figure 2-1*.

Figure 2-1 HS-AT2311 physical interfaces

Table 2-2 describes the function of each physical interface.

Table 2-2 HS-AT2311 interface functions

No.	Interface name	Description
1	USB port	USB 2.0 port extended from Type-C port. Used to connect salve devices such as U disk.
	Power port	Extended from Type-C port to connect DC power adapter. Hanshow provides standard 12V-2A adapter. The port can also provide 12V output power.
	WAN port	100M/10M adaptive Ethernet port extended from Type-C port

No.	Interface name	Description
2	RS232 port 1	Device debug port for professional technicians, extended from Type-C port, to connect with device supporting RS232 port
	RS232 port 2	Device debug port for professional technicians, extended from Type-C port, to connect with device supporting RS232 port
	Power port	Extended from Type-C port to connect DC power adapter. Hanshow provides standard 12V-2A adapter. The port can also provide 12V output power.
	USB port	USB 2.0 port extended from Type-C port. Used to connect salve devices such as U disk.

⚠ **Note:** Be sure to use the cables provided by Hanshow. For more information, see *Hanshow Cable User Manual*.

2.3 Nameplate

HS-AT2311 nameplate is as shown in *Figure 2-2*.

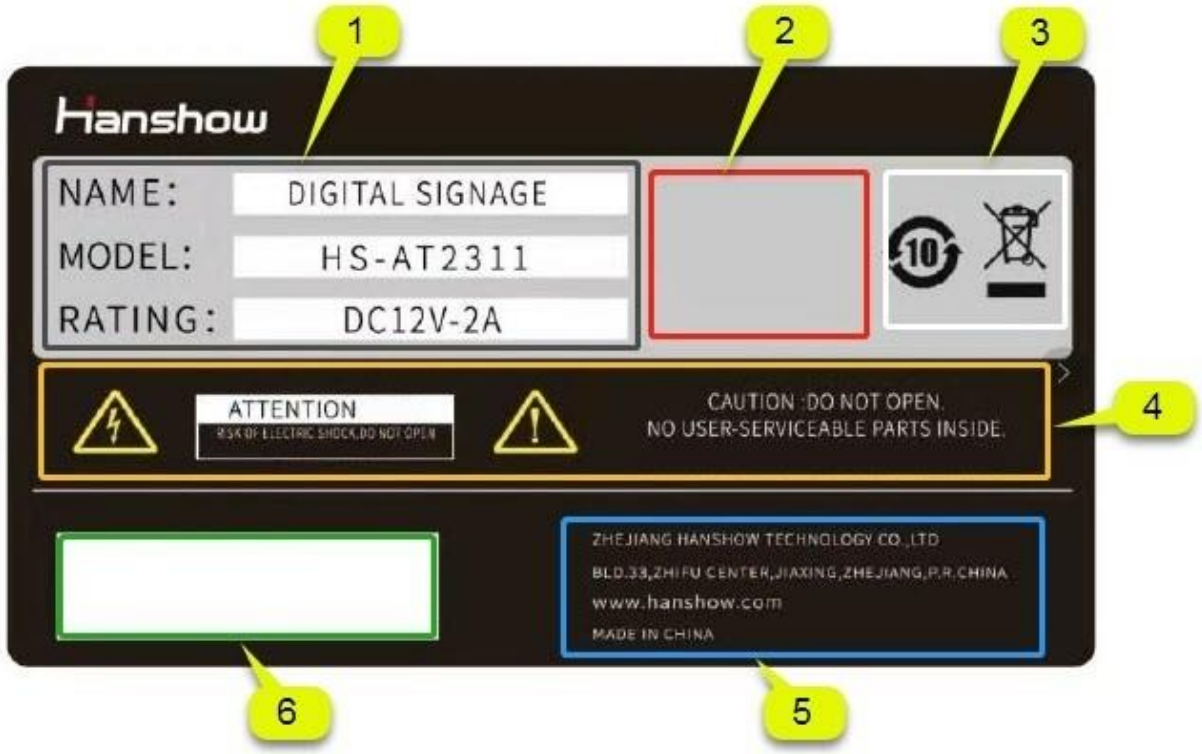

Figure 2-2 HS-AT2311 nameplate

Table 2-3 describes the information on HS-AT2311 nameplate.

Table 2-3 HS-AT2311 nameplate information

No.	Area	Description
1	Upper-left gray box area	NAME: Product category MODEL: Unique model name in Hanshow RATING: Rated voltage and current
2	Upper red box area	Shows passed certification marks such as CCC, CE, FCC, and ROHS.
3	Upper-right white box area	Indicates the product lifetime is 10 years. The product cannot be discarded casually. It must be disposed of by a special recycling agency.
4	Middle yellow box area	Shows the precautions for use, transportation, storage, and other conditions.
5	Lower-right blue box area	Shows device manufacturer information.
6	Lower-left green box area	Shows the unique serial number (SN) of product production.

2.4 Appearance parameters

Table 2-4 describes HS-AT2311 appearance parameters.

Table 2-4 HS-AT2311 appearance parameters

Name		Description
Structural materials	Frame	Cold rolled iron sheet
	Rear case	Aluminum alloy
Length * Width * Height (mm*mm*mm)		600*61*16
Net weight (g)		713
Color		Black

3 Installation

This chapter introduces HS-AT2311 installation and required accessories.

3.1 Description

HS-AT2311 needs to be installed on the shelf end for better effects of visual playback and marketing campaign, as shown in *Figure 3-1*.

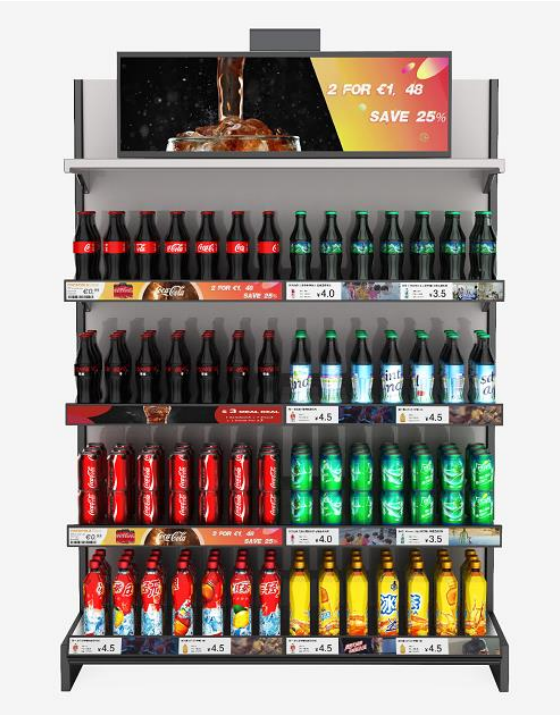

Figure 3-1 HS-AT2311 installation

⚠ Note:

- It's recommended to leave at least 1 meter of free space in front of the display screen, in order that customers can have better experience on watching screen content.
- It's recommended to install the shelf edge digital signage in the middle or top of the shelf. The length of the shelf edge digital signage should match shelf length.
- The installation location should have good Wi-Fi coverage.
- The surrounding metal interference should be as little as possible. In particular, avoid cage interference effect.
- Be sure to install firmly to avoid loosening and falling off.

3.2 Installation accessories

Figure 3-2 HS-AT2311 installation accessories.

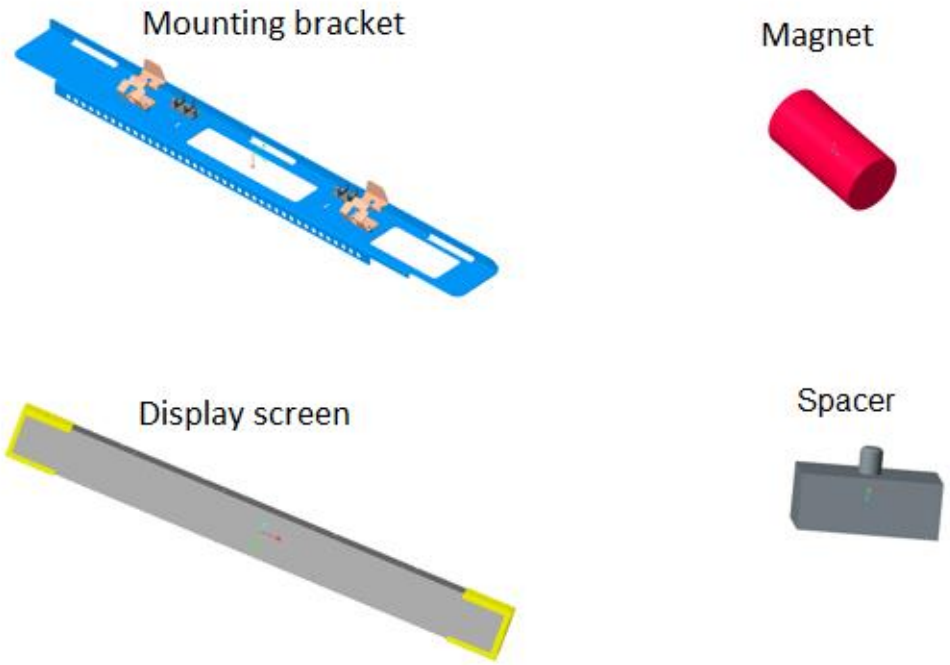

Figure 3-2 HS-AT2311 standard installation accessories

It's recommended to use hanging installation method, as shown in *Figure 3-3*.

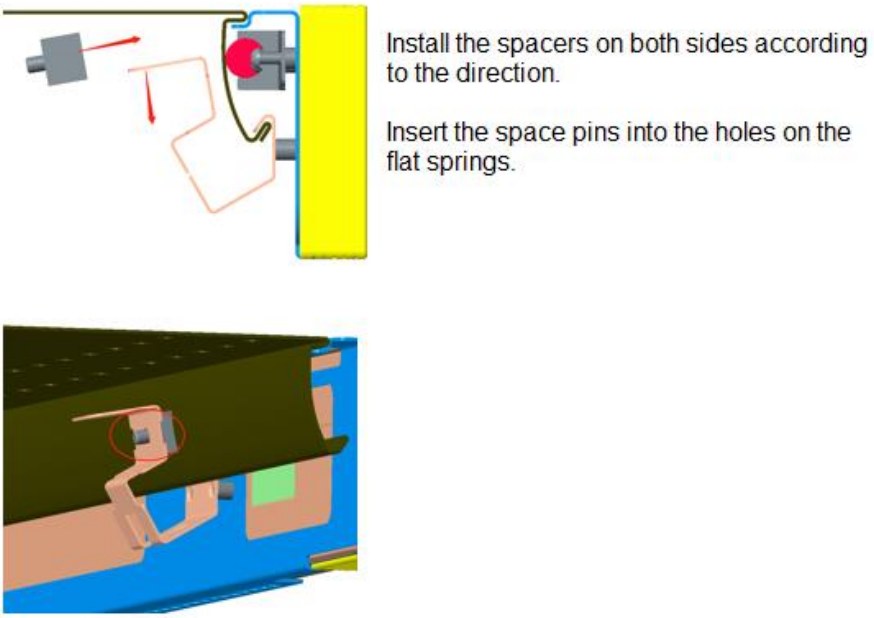

Figure 3-3 HS-AT2311 assembly diagram

Note: For information of detailed installation instructions and other installation methods, see *Hanshow Shelf Edge Digital Signage HS-AT2311 Installation Manual*.

4 Operations

This chapter describes network settings and system upgrade of HS-AT2311.

4.1 Network settings

HS-AT2311 currently only supports direct operation of the device for network settings. HS-AT2311 support both Wi-Fi and Ethernet connections. You can configure network environment according to actual use scenarios.

1. On the device's system desktop, tap **Settings** to open the Settings page, as shown in *Figure 4-1*.

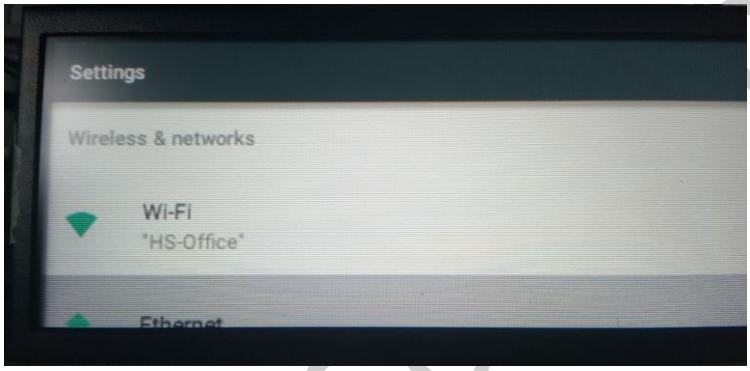

Figure 4-1 Network settings selection page

2. Select **Wi-Fi** or **Ethernet** according to your network requirements.

4.1.1 Wi-Fi settings

Follow the steps below to configure Wi-Fi network connection:

1. Tap **Wi-Fi** to open the wireless network settings page.
2. On the upper-right corner of the page, tap the switch to turn on the Wi-Fi connection function. The system automatically searches for available wireless networks, and then lists available network access points, as shown in *Figure 4-2*.

Figure 4-2 Turn on wireless network connection

3. Tap the access point you want to connect. The setting page for the selected wireless network opens.
4. If static IP setting is not required, enter the wireless network password directly, and then tap the **Complete** button on the soft keyboard. The system automatically

connects to the wireless network, as shown in *Figure 4-3*. If the entered password is correct, the system connects to the wireless network successfully, and shows message indicating successful network connection. This completes the DHCP (dynamic IP assignment) configuration of the wireless network.

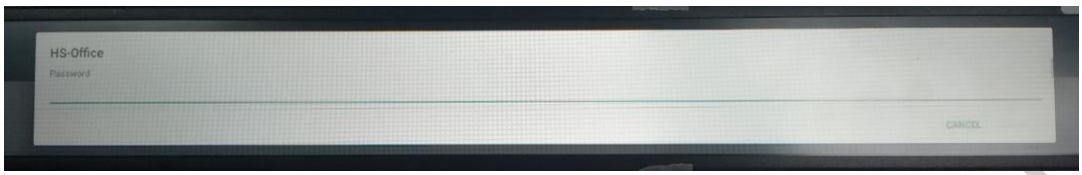

Figure 4-3 Enter wireless network password

If dynamic IP setting or other network setting is required, on the password input page, swipe down the page, and then tap **Advanced options**, as shown in *Figure 4-4*.

Figure 4-4 Tap Advanced options to set static IP

The bottom of the page shows configuration options for the wireless network. *Table 4-1* describes configuration details.

Table 4-1 Wireless network static IP configuration options

Configuration item	Description
Proxy	Network proxy, configuration item for network proxy server, can be configured manually or automatically.
Proxy server host name	Proxy server IP address, can be set when the proxy is configured manually.
Proxy server port	Proxy server port number, can be set when the proxy is configured manually.
Do not use proxy for	Domain names that do not use proxy. The domain names configured here will not make network interactions through the proxy server. This configuration item can be set when the proxy is configured manually.
PAC URL	Automatic proxy configuration script, can be configured when the proxy is configured automatically.
IP setting	If it's set to static, device IP address needs to be manually configured. If it's set to DHCP, device IP address needs to be obtained from the DHCP server.

Configuration item	Description
IP address	IP address, can be configured when IP setting is set to static.
Gateway	Gateway address, can be configured when DHCP is selected for IP settings.
Network prefix length	The bit length of the network prefix, usually 24, can be configured when DHCP is selected for IP settings.
DNS	Domain name servers, including DNS1 and DNS2. DNS1 is the primary DNS server. Only when DNS1 cannot find IP addresses corresponding to domain names or when DNS1 is unavailable, can DNS2 configuration take effect. This configuration item can be configured when DHCP is selected for IP settings.

After the configuration is complete, tap the **Save** button. The system automatically connects to the wireless network according to the configurations. If the connection is successful, the screen displays “Connected”, as shown in *Figure 4-5*.

Figure 4-5 Wireless network connected successfully

4.1.2 Ethernet settings

Follow the steps below to configure Ethernet connection:

1. Tap **Ethernet** to open the Ethernet settings page.
2. On the upper-right corner of the page, tap the switch to turn on the Ethernet connection function. Ethernet settings also support DHCP and static IP settings, as shown in *Figure 4-5*.

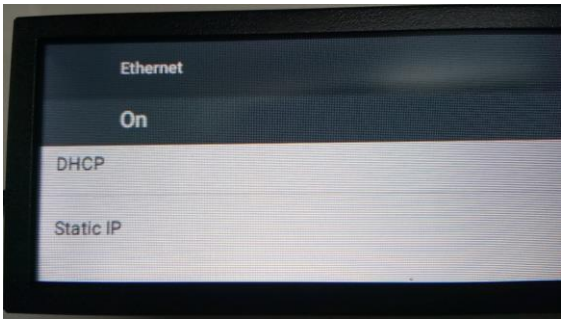

Figure 4-6 Ethernet settings

3. Select **DHCP** or **Static IP**. If **Static IP** is selected, the bottom of the page shows some configuration items, as shown in *Table 4-2*.

Table 4-2 Ethernet static IP configuration options

Configuration item	Description
IP address	Static IP address to be configured
Gateway	Gateway address to be configured
Subnet mask	Subnet mask to be configured
DNS	Domain name servers, including DNS1 and DNS2. DNS1 is the primary DNS server. Only when DNS1 cannot find IP addresses corresponding to domain names or when DNS1 is unavailable, can DNS2 configuration take effect. This configuration item can be configured when DHCP is selected for IP settings.

📖 **Note:** After the manual configuration is complete, the system saves the configuration parameters. When switching between manual and automatic settings, the configuration does not need to be re-configured.

4.2 System upgrade

HS-AT2311 supports two upgrade methods:

- Manual upgrade by U disk

  The file system of USB flash drive is FAT32. Create folder named **upgrade** under the root directory of the USB flash drive. Save the system upgrade compression package to the folder. After device startup, insert the USB flash drive. The system automatically upgrades.

- Automatic upgrade through the network

  The device should be connected to extranet, or a server should be deployed for upgrade in the intranet, so that the device can be upgraded through interaction with the server.

⚠ **Note:** Do not cut off power supply during the upgrade process. Power cut can damage the system.

5 Activation

Follow the steps below to activate HS-AT2311:

1. Before use shelf edge digital signage HS-AT2311, check and ensure the power cable connection and network cable connection are correct.
2. Make sure to use the standard 12V power adapter.
3. After power-on, the backlight of HS-AT2311 display is on, and the system starts to start.
4. The startup time is about 35 seconds. After system startup, the screen displays standard system interface or preset playback content.
5. After system startup, configure network settings according to instructions in section *4.1*, for HS-AT2311 IP settings and other configurations.
6. If the configuration is correct and complete, HS-AT2311 automatically connects to Wi-Fi network. If the connection is successful, the network status indicator shows the connection status and periodically reconnects until the connection is successful. Otherwise, “!” is displayed.

⚠ **Note:** To use 2.4G Wi-Fi, it’s recommended to set 2.4G channel to 1, 6, or 11.

6 Packing list

This chapter introduces the packing diagram and contents of HS-AT2311.

6.1 Packing diagram

Figure 6-1 shows the packing of HS-AT2311.

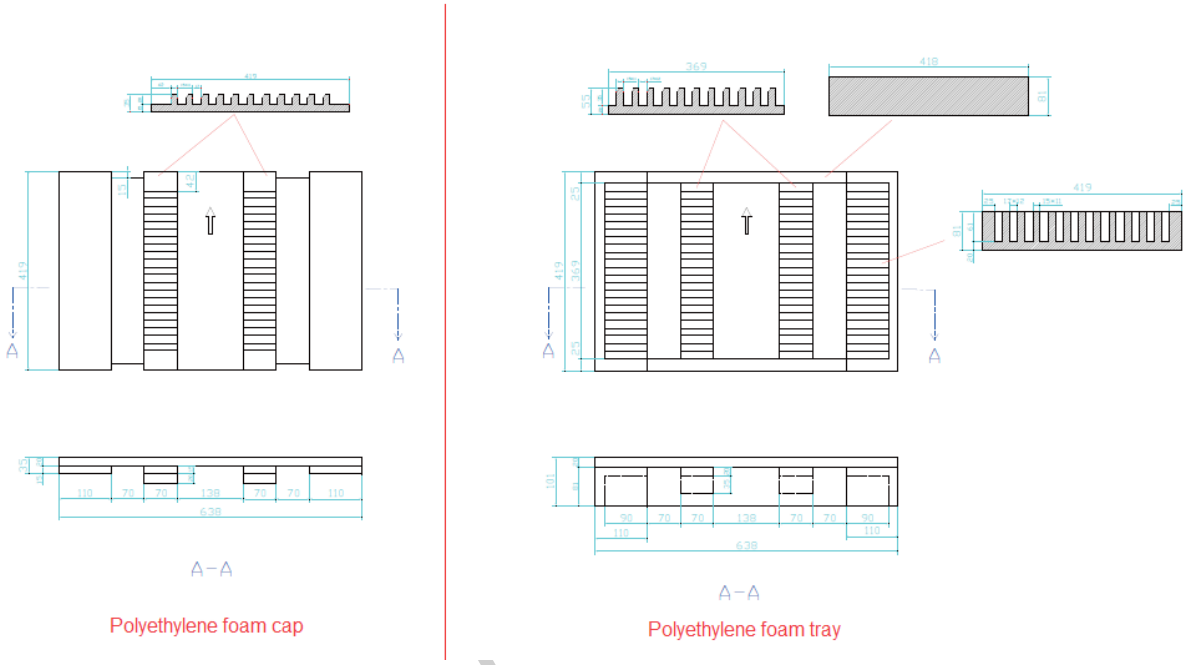

Figure 6-1 HS-AT2311 packing diagram

6.2 Package contents

HS-AT2311 package contains:

- 12 shelf edge digital signage HS-AT2311
- One polyethylene foam cap
- One polyethylene foam tray
- One product manual
- One certificate