Hanshow ESL Controller HS_C09979 Product Manual

V1.0.1

HS-AP-USB5001

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ABOUT THE DOCUMENT

This manual describes an instruction for ESL controller HS_C09979 involved in its features, specifications, the related configurations and precautions. Help you quickly understand all information for this device.

Please read this manual carefully before using the device, retain the manual 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 (China: 400-0365-305; Netherlands: 0800-022-5037; Belgium: 0800-71-335; France: 0800-91-7602; Thailand: 1800-011-185) directly, we will provide you with multi-channel technical services.

TARGET USERS

This document provides engineers with necessary data and related guidelines. Users have to master the basic knowledge on communication, DSP, network and so on. This manual is applicable for the below engineers:

- Testing engineer
- Technical support engineer
- After sales engineer
- Installation Engineer

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SYMBOL DESCRIPTION

Icon	Description
⚠	Information indicated with this icon should be paid special attention and attached great importance 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
ESL Controller	ESL Controller	Also called AP that is used for data interaction between ESL-Working and ESL Controller.
ESL	Electronic Shelf Label	Used for displaying product information like promotion information, price and grade, etc.
Wi-Fi	Wireless Fidelity	Wi-Fi
RF	Radio Frequency	Electromagnetic frequency that can radiate into space.

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1 Overview

1.1 Hardware appearance and naming

HS_C09979 is Hanshow's fifth-generate ESL controller. HS_C09979 adopts USB physical interface embedded micro-PCB, which is dedicated to WLAN device that has USB virtual network function, known as USB integration AP. This product must be plugged into a Wi-Fi Access Point (typically mounted into the ceiling) using the USB interface during use. Its major advantage is to provide Wi-Fi access and ESL service simultaneously, providing a better user experience.

HS_C09979 works in 2.4GHz wireless frequency band for data transmission and information interaction between ESL-Working and ESLs. HS_C09979 adopts modular and omnidirectional in-board antenna design. And it is equipped with an ARM Cortex-A7 processor, RF and other modules, supporting all Hanshow products. HS_C09979 appearance is shown in *Figure 1-1.*

Figure 1-1 HS_C09979 (white)

1.2 Product characteristics

1.2.1 Hardware characteristics

- Hardware interface: USB port as virtual Ethernet port, power port or serial interface.
- RF system: 3 RF modules. Each has the independent antenna, with concurrent communication.
- LED indicator: Real-time display of working status.
- Physical interface and indicator: See *Figure 1-2*. Descriptions of interface features see *Table 1-1*.

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Figure 1-2 HS_C09979 Physical interface diagram

📖 **NOTE:** The above image is for reference only, the actual product prevails.

Table 1-1 Function description for HS_C09979's interfaces

No.	Interface name	Description
1	USB interface	A USB 2.0 interface used for power port and virtual network port.
2	RESET hole	● Press and hold reset hole over 5s will resume factory settings; ● Press reset hole can switch between DHCP service activation and static IP (192.168.1.199). Mind that the reset hole will be invalid within 30s after either feature is triggered. More information please refer to section *4.1 Key operation*.
3	LED indicator	● When LED is off or red light is constantly on, system operation is in abnormal state; ● When green light is constantly on, Ethernet connection is normal and ESL-Working is unconnected; ● When green light blinks rapidly, or blanks during startup, system has not obtained IP; ● When green light blinks slowly, Ethernet connection is normal and ESL-working is connected.

⚠ **NOTICE:** The AP shall enter self-test mode after it is booted, the dual-color LED shall blink alternatively. LED shall stop blinking when system operates normally. In case an exception occurs: if you find the red LED is constantly on after it blinks once, this means the daughterboard No.1 is in abnormal state; if you find the red LED is constantly on after it blinks twice, this means the daughterboard No.2 is in abnormal state; if you find the red LED is constantly on after it blinks 3 times, this means the daughterboard No.3 is in abnormal state; if you find the red LED is constantly, this means the motherboard is in abnormal state.

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1.2.2 Software characteristics

- Operating system: An embedded Linux OS handles data interchanges with ESL-Working, such as: registration of ESL controller system, heartbeat reception, data transmission etc. In addition, online update can be supported.
- Smart dual-system: Dual-system is supported for the sake of automatically disaster recovery capacity.
- Compatibility: Can support both Hanshow 3rd and 5th generation ESL products.
- Administrative configuration: Can support Webpage configuration.

1.3 Specifications

Product Specifications are as shown in *Table 1-2.*

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Table 1-2 HS_C09979 specifications

ITEM		DESCRIPTION
Power supply	Input voltage	DC 5V
	Rated current	300mA
	Max. power	2.5W
	Other	Over-load/over-voltage/over-heat protection
RF module (2.4G module)	Working frequency	2,402MHz ~ 2,480MHz 2,478MHz ~ 2,493MHz (only applies to Japan)
	Output power	6dBm by default
	Antenna gain	≥0.5dBi
	Antenna characteristics	Three-channel Omni-directional onboard antenna
	Ultra-high sensitivity	-95dBm at 500Kbps; -97dBm at 100Kbps
	System throughout	60,000 ESLs per hour
Ethernet	Connection rate	10/100M from USB virtual network port (Adaptive)
	Auto-negotiation	Support
	DHCP	Support
Temperature	Operating temperature	0°C ~ 50°C
	Storage temperature	-30°C ~ 70°C
Humidity	Relative humidity (%RH)	10% ~ 90% (non-condensing)
Dimension	L*W*H (mm)	40.2*99.7*15.8
Case	-	White

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2 Ex-factory state description

2.1 Nameplate information

The nameplate of HS_C09979 contains the following implications, as shown in *Figure 2-1*.

- IP and MAC address are the default configuration of HS_C09979.
- IP address can be modified through configuration page.

Figure 2-1 Nameplate of HS_C09979

Note: The above nameplate is only for reference, in kind prevails. The SN and MAC address are all on the side of HS_C09979.

2.2 Ex-factory packaging

HS_C09979 is packaged by Kraft paper, and the packaging list is:

- ESL Controller (HS_C09979) *1
- Fixed accessory *1

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3 Product features

3.1 System architecture

Hanshow ESL system is composed by Electronic Shelf Label (ESL), ESL controller (AP), ESL-Working, PriSmart, database, integration server, monitoring system and Handheld Terminal (PDA), as shown in *Figure 3-1*.

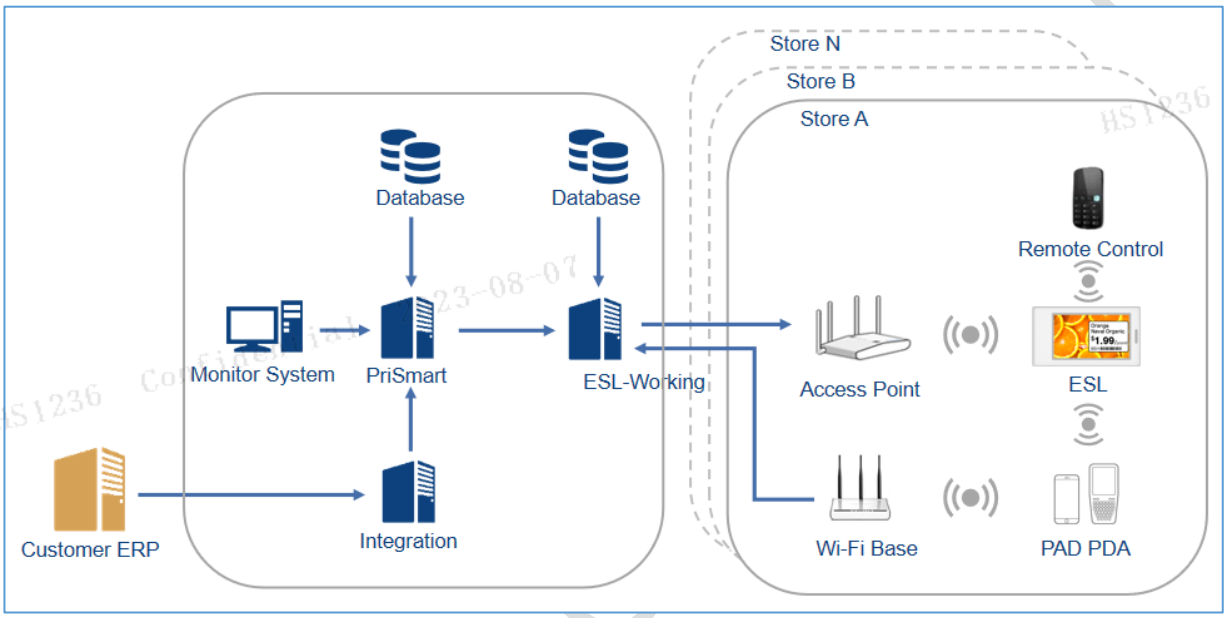

Figure 3-1 ESL system architecture

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3.2 Features

As an integral part of Hanshow's ESL system, ESL controller handles the data transmission and information exchanges between ESL and ESL-Working; while ESL-Working implements ESL management, business control and obtains ESL reported messages via ESL controller.

HS_C09979 connects to ESL system and establish bidirectional RF communication at 2.4 GHz via Ethernet interface (POE). It has the following features:

- Downlink: ESL controller receives downlink packets from ESL-Working via wireless network, in order to execute updating, networking, fast flash and global etc. businesses on ESLs.
- Uplink: ESL controller forwards ESL heartbeat packet etc. information to ESL-Working based on the ESL wireless protocol standard.
- Monitor RF network quality in real-time manner.
- Utilize cellular networking technology, network radius can reach 12m.
- Financial grade security chip: support AES-256, AES-128 and RSA1024/2048 encryption algorithm, SHA digest algorithm, TRNG true random integers so as to guarantee system safety and reliability.
- Utilize multi-antenna technology to improve single AP capacity.
- Support remote upgrade.
- Support real-time status report and monitoring.
- Assisting ESL administration.

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3.3 Feature list

ESL system features are shown in *Table 3-1*.

Table 3-1 Feature list

NO.	FEATURE	DESCRIPTION
1	Webpage configuration	Users can configure network, set ESL-Working, reboot ESL controller, describe the device, set NTP server, change password, restore factory setting and upgrade system.
2	Heartbeat reception	Periodically collect ESL heartbeat. ESL heartbeat data contain ESL basic information, such as: ID, firmware version number, wake up cycle, work frequency point, battery volume etc.
3	Association/disassociation	Association feature is used to create the association between commodity and ESL and refresh ESL's preset screen in which contains various commodity information, e.g. commodity name, price, origin, promotion information, QR code etc.; while disassociation feature is used to remove the association between commodity and ESL and execute ESL screen refresh based on preset disassociation template.
4	Update	Once there is change(s) of commodity information, such as: price change, release of promotion information etc., update feature shall be enabled by the system in order to refresh corresponding ESL screen(s).
5	Global flash	This feature can make LEDs of all store ESLs flash using system interface. Flashing rules follow the preset configuration option values.
6	Global page switch	After multiple pages are stored into ESLs in advance, this feature allows all store ESLs to switch to the specified pages. Page number and retention time can be configured using the corresponding interface.
7	Timed task	This feature can send timed global flash command and timed global page switch command in advance, so that all those ESLs who received the commands will synchronously execute these commands at specified time.
8	Fast page switch	After multiple pages are stored into ESLs in advance, this feature allows the specified ESLs to switch to the specified pages. Page number and retention time can be configured using interface.
9	Fast flash	This feature can make specified LED of ESL flash quickly using system interface. Color of flashing LED, LED on/off time and number of flash time can be configured using the corresponding interface.
10	Fast network access	Scan ESL to accomplish fast network access using NFC device.
11	ESL upgrade	The APP and driver of ESL can be upgraded independently using broadcasting method.

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4 Product operation

4.1 Key operation

Reset hole supports press and hold and press, each owns different function.

4.1.1 Press

Press is used to switch IP address acquisition mode. This feature is strictly limited and just to operate when AP is not connected to network. AP address will switch between DHCP and static IP with each press.

- When the ESL controller is in DHCP client mode, device IP will be obtained from the DHCP server.
- When the ESL controller is in static IP mode, the default settings are as follows:

  IP--192.168.1.199, Subnet mask--255.255.255.0, Gateway--192.168.1.1.

NOTE: The protection interval between two operations should be at least 30s, that is, if you press again within 30s after last successful operation, your operation will be invalid.

4.1.2 Press and hold

Press and hold reset hole is more than 5s, AP will restore factory setting. And the nixie light and LED indicators on front panel lights on for about 2s, AP will restore factory setting and reboot. Restore factory setting contains the following contents:

- Restore to DHCP client mode.
- Restore to auto search mode of ESL-Working.
- Clear custom description.
- Restore web login password to “admin”.
- NTP restores to disabled by default.

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4.2 Parameter setting

4.2.1 Aruba Wi-Fi AP configurations

4.2.1.1 Software/hardware configurations

The software and hardware requirements of HS_C09979 to Aruba Wi-Fi are shown in *Table 4-1*.

Table 4-1 Descriptions of Aruba Configuration Options

HARDWARE	SOFTWARE VERSION	DESCRIPTION
IAP/controller	8.7.1.2	300/500 series (USB port).
Aruba Central	2.5.4	Template group, via the UI group of API.

4.2.1.2 ESL controller configurations

Configure Aruba Wi-Fi AP as follows:

1. Add Hanshow USB Dongle. Log in to Aruba Wi-Fi AP and execute the command lines as shown in *Figure 4-1*:

```
20:4c:03:17:de:e0 #configure terminal
20:4c:03:17:de:e0 (config) # wired-port-profile Hanshow-AP
20:4c:03:17:de:e0 (wired approfile Hanshow-AP)#switchport-mode trunk
20:4c:03:17:de:e0 (wired approfile Hanshow-AP)#allowed-vlanall
20:4c:03:17:de:e0 (wired approfile Hanshow-AP)#native-vlan1
20:4c:03:17:de:e0 (wired approfile Hanshow-AP)#trusted
20:4c:03:17:de:e0 (wired approfile Hanshow-AP)#no shutdown
20:4c:03:17:de:e0 (wired approfile Hanshow-AP)#access-rule-name Hanshow-AP
20:4c:03:17:de:e0 (wired approfile Hanshow-AP)# exit
20:4c:03:17:de:e0 (config) # wlanaccess-rule Hanshow-AP
20:4c:03:17:de:e0(Access Rule "Hanshow-AP") rule any anymatch any anyanypermit
20:4c:03:17:de:e0(Access Rule "Hanshow-AP") exit
20:4c:03:17:de:e0 (config) enet-usb-port-profile Hanshow-AP
```

Figure 4-1 Add Hanshow USB Dongle

2. Verify if Aruba Wi-Fi AP has been added Hanshow USB Dongle.

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a. Check USB port status by executing the `show port status` command, as shown in *Figure 4-2*.

```
20:4c:03:17:de:e0# show port status

Port Status
-----------
Port  Type  Admin-State  Oper-State  STP-State  Dot3az   Loop-Protect  Storm-Control  Loop-Detect
----  ----  -----------  ----------  ---------  ------   ------------  -------------  -----------
eth0  GE    up           up          Off        Disable  OFF           OFF            0
eth1  GE    up           down        Off        Disable  OFF           OFF            0
eth2  GE    up           down        Off        Disable  OFF           OFF            0
eth3  GE    up           down        Off        Disable  OFF           OFF            0
eth4  USB   up           up          Off        Disable  OFF           OFF            0
20:4c:03:17:de:e0#
```

Figure 4-2 Check USB port status

b. Check wired port status by executing the `show wired-port-settings` command, as shown in *Figure 4-3*.

```
20:4c:03:17:de:e0# show wired-port-settings

Wired Port Profiles
-------------------
Name                        VLAN Mode  Allowed VLANs  Native VLAN  Admin Status  Role
----                        ---------  -------------  -----------  ------------  ----
wired-SetMeUp               Access     all            guest        Up            wired-SetMeUp
default_wired_port_profile  Trunk      all            1            Down          default_wired_port_pr
Hanshow-AP                  Trunk      all            1            Up            Hanshow-AP
Hanshow-AP1                 Trunk      all            guest        Up            Hanshow-AP1
test                        Trunk      all            1            Up            test
Port Profile Assignments
------------------------
Port  Profile Name
----  ------------
0     default_wired_port_profile
1     wired-SetMeUp
2     wired-SetMeUp
3     wired-SetMeUp
4     wired-SetMeUp
USB   Hanshow-AP
```

Figure 4-3 Check wired-port status

3. Debug.

a. Execute the `show usb-enet client` command as shown in *Figure 4-4*.

```
84:d4:7e:c5:23:ae# show usb-enet client

USB ENET Client Info
--------------------
client mac         client ipv4  client ipv6  ap name            ap mac             vender ID
----------         -----------  -----------  -------            ------             ---------
98:6d:35:70:04:59  6.6.6.244                 84:d4:7e:c5:23:ae  84:d4:7e:c5:23:ae   0525
```

Figure 4-4 Debug main device

b. Execute the `show ap debug usb-enet client` command as shown in *Figure 4-5*.

```
84:d4:7e:c5:23:ae# show ap debug usb-enet client

AP USB ENET Device Table
------------------------
mac address        ipv4 address  ipv6 address  vender ID  product ID  vender name
-----------        ------------  ------------  ---------  ----------  -----------
98:6d:35:70:04:59  6.6.6.244                    0525        a4a2        Hanshow
```

Figure 4-5 Debug sub device

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c. Check data communication of USB port as shown in *Figure 4-6*.

```
~ # ifconfig eth1
eth1      Link encap:Ethernet  HWaddr 86:D4:7E:C5:23:AE
          UP BROADCAST RUNNING NOARP MULTICAST  MTU:1500  Metric:1
          RX packets:948 errors:0 dropped:0 overruns:0 frame:0
          TX packets:27358 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:345516 (337.4 KiB)  TX bytes:3265373 (3.1 MiB)
```

Figure 4-6 Check data communication of USB port

NOTE: More information about integration settings and configuration information please refer to the documentations at Aruba official websites, as shown below:

- Aruba CLI Reference Guide: *https://asp.arubanetworks.com*
- Aruba IOT WebSocket Interface: *https://asp.arubanetworks.com*
- Aruba IoT Interface Guide Azure IoTHub: *https://asp.arubanetworks.com*
- Aruba IoT Basic Setup Guide: *https://asp.arubanetworks.com*

4.2.2 HS_C09979 Parameter configurations

The webpage configuration mode of HS_C09979 allows users to configure and manage device via webpage.

4.2.2.1 **Device homepage**

You can access HS_C09979 IP address to enter configuration page. For example: If HS_C09979 IP is 192.168.51.100, IP address is: *https://192.168.51.100*, that is, enter logon page and configuration homepage to configure HS_C09979. Default password is: admin.

A pop-up prompts you to change your password. The password includes 12 ~18 digits, letters and special symbols (~!@#) to enhance safety intensity. Click **OK** after resetting it, or click **Cancel**, as shown in *Figure 4-7* and *Figure 4-8.*

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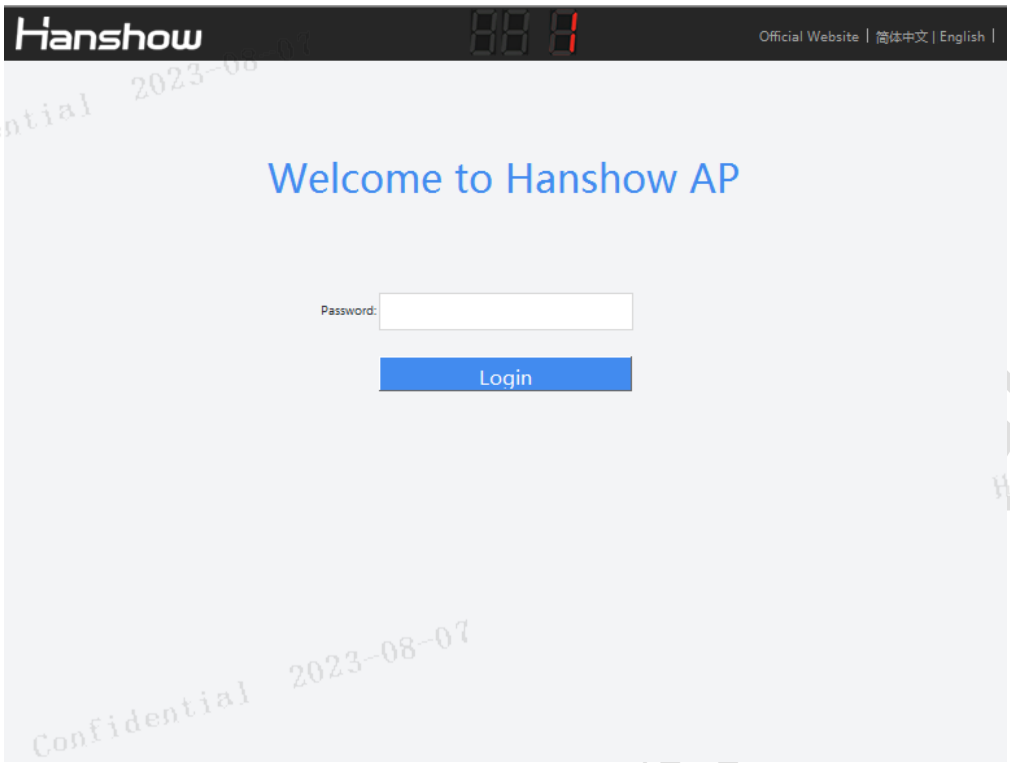

Figure 4-7 Login page

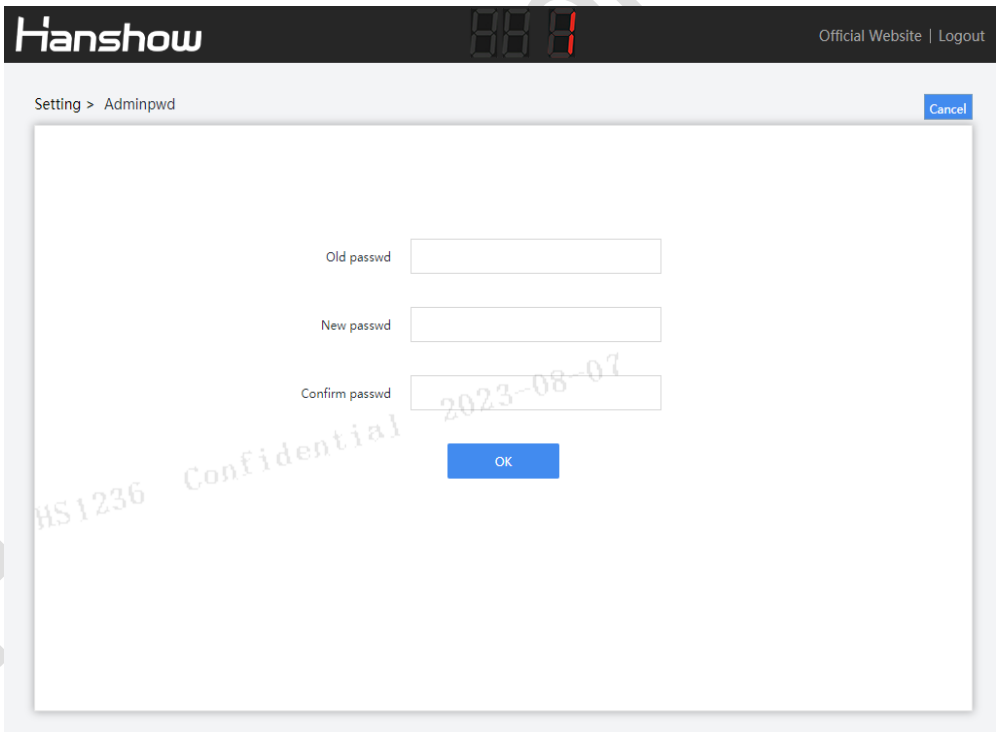

Figure 4-8 Password setting page

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If the password does not meet the security rules, a prompt message appears, as shown in *Figure 4-9*.

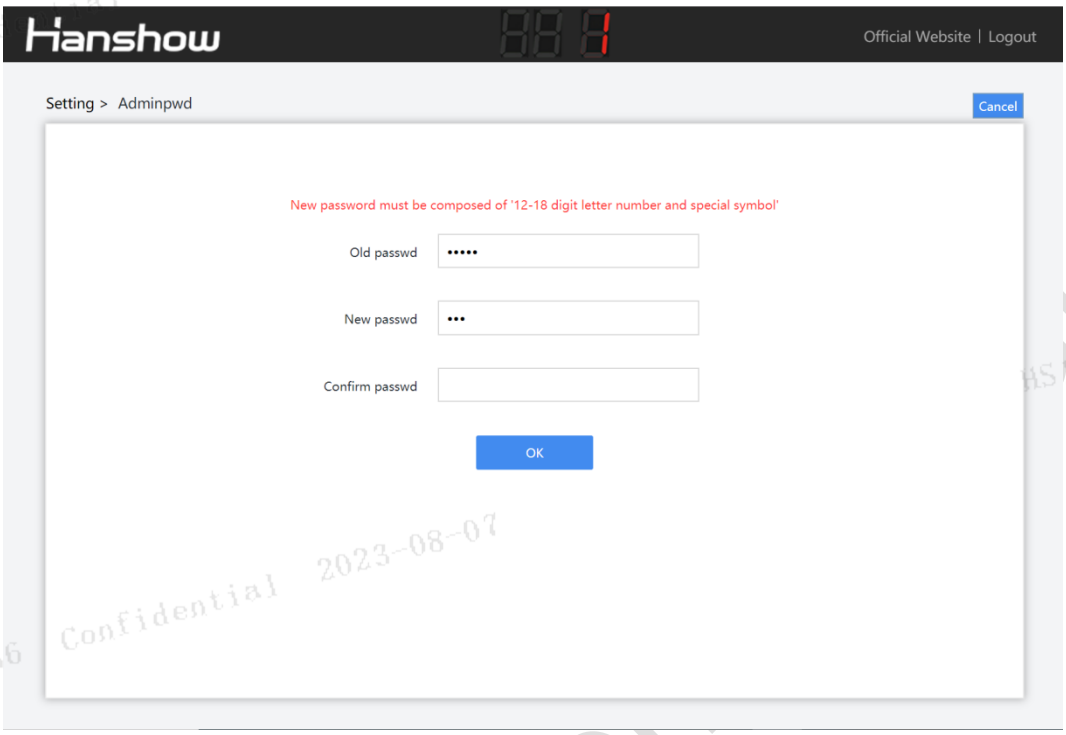

Figure 4-9 Password setting prompt 1

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If the password is set incorrectly, a prompt message appears, as shown in *Figure 4-10*.

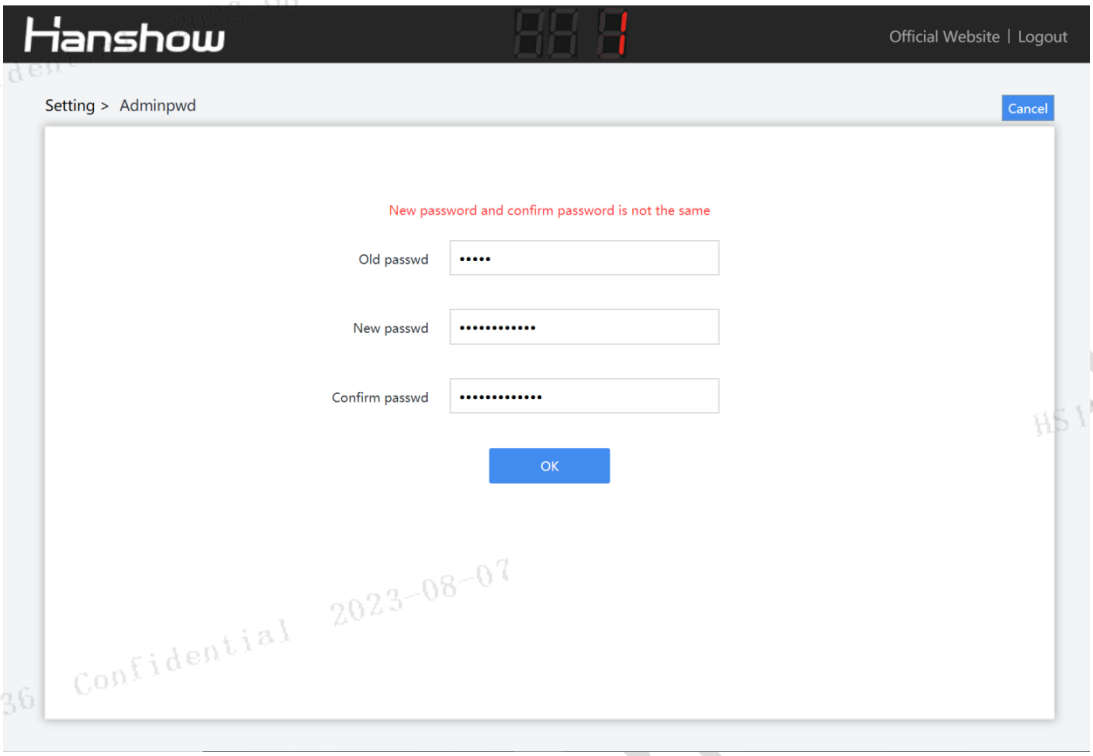

Figure 4-10 Password setting prompt 2

NOTE:

- Both Chinese and English are supported, switch the language you want in upper-right corner.
- If the password strength is not strong enough, a pop-up prompts to reset your password. If you don't want to reset, click Cancel to skip.

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HS_C09979's configuration homepage is as shown in *Figure 4-11*.

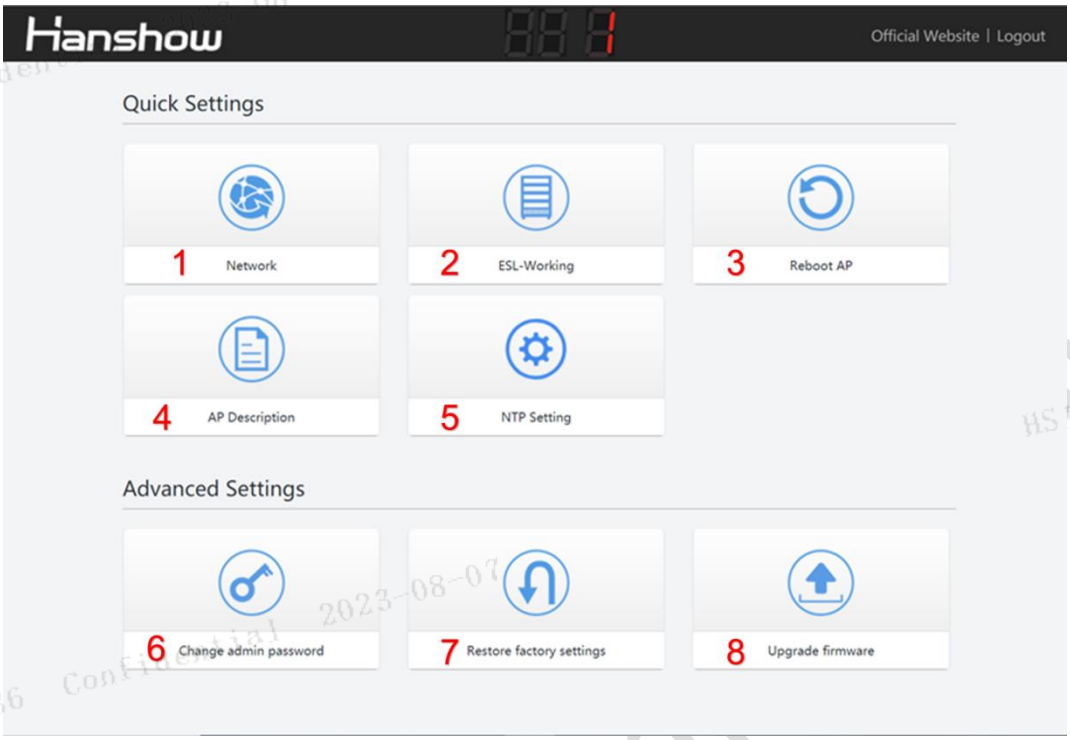

Figure 4-11 Configuration homepage

The configuration items are illustrated as shown in *Table 4-2*.

Table 4-2 Configuration option description

NO.	CONFIGURATION ITEM	DESCRIPTION
1	Network	Used to set network parameters.
2	ESL-Working	Used to configure ESL-Working parameter.
3	Reboot AP	Reboot AP device.
4	AP Description	To add description information.
5	NTP Setting	Used to configure NTP service.
6	Change admin password	Used to change the password.
7	Restore factory settings	Used to restore default settings.
8	Update firmware	Used to upgrade for main system and RF subsystem.

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4.2.2.2 Network setting

Network setting is used for setting network parameter of HS_C09979. It supports two IP types: IPv4 and IPv6; two IP address acquisition modes: DHCP or static IP.

If IP type is IPv4, the configuration page is shown in *Figure 4-12*.

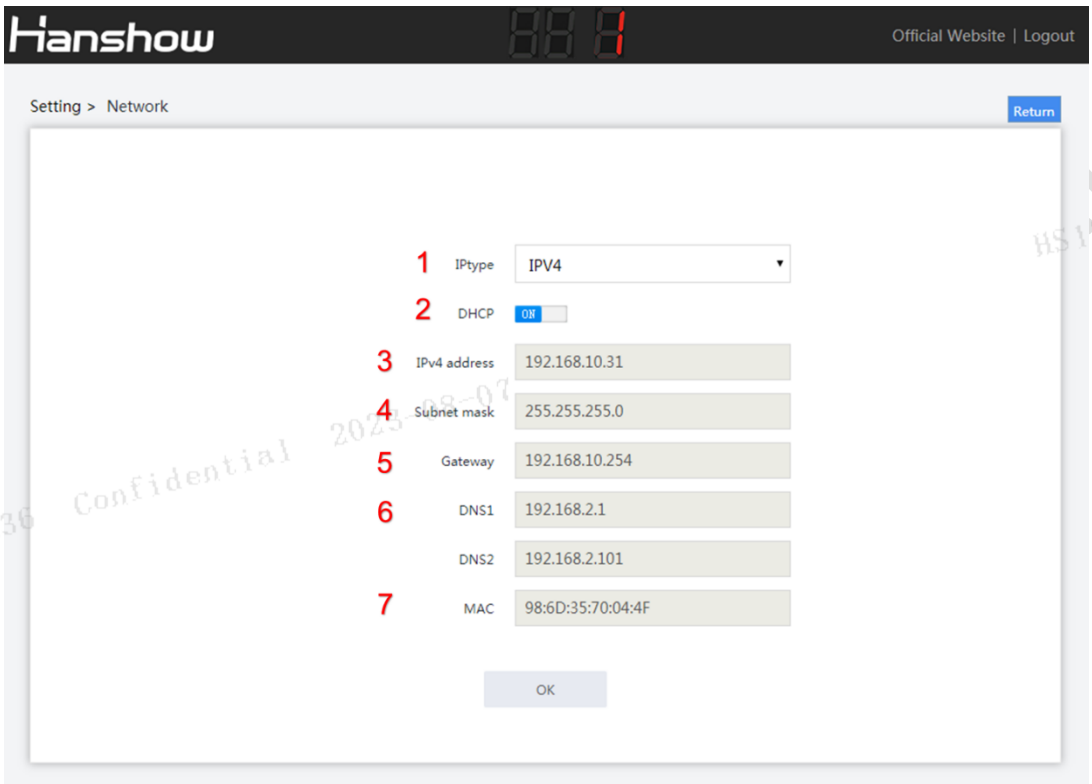

Figure 4-12 Network configuration page 1

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The configuration options are illustrated as shown in *Table 4-3*.

Table 4-3 Configuration option description

NO.	CONFIGURATION OPTION	DESCRIPTION
1	IP type	Support IPv6/IPv4 dual protocol stacks. To configure the parameters when selecting IPv4.
2	DHCP	● When set to OFF, IP address should be configured manually. ● When set to ON, the device is DHCP client, and IP address should be get from DHCP server.
3	IPv4 address	Configurable when DHCP is OFF.
4	Subnet mask	Configurable when DHCP is OFF.
5	Gateway	Configurable when DHCP is OFF.
6	DNS	Domain Name Server (DNS), DNS1: Primary DNS server; DNS2: Secondary server. Must be set when the ESL-Working address is configured as domain name address; Enable DHCP, to get DNS from DHCP.
7	MAC	Unique MAC address, refer to the nameplate.

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If IP type is IPv6, the configuration page is shown in *Figure 4-13*.

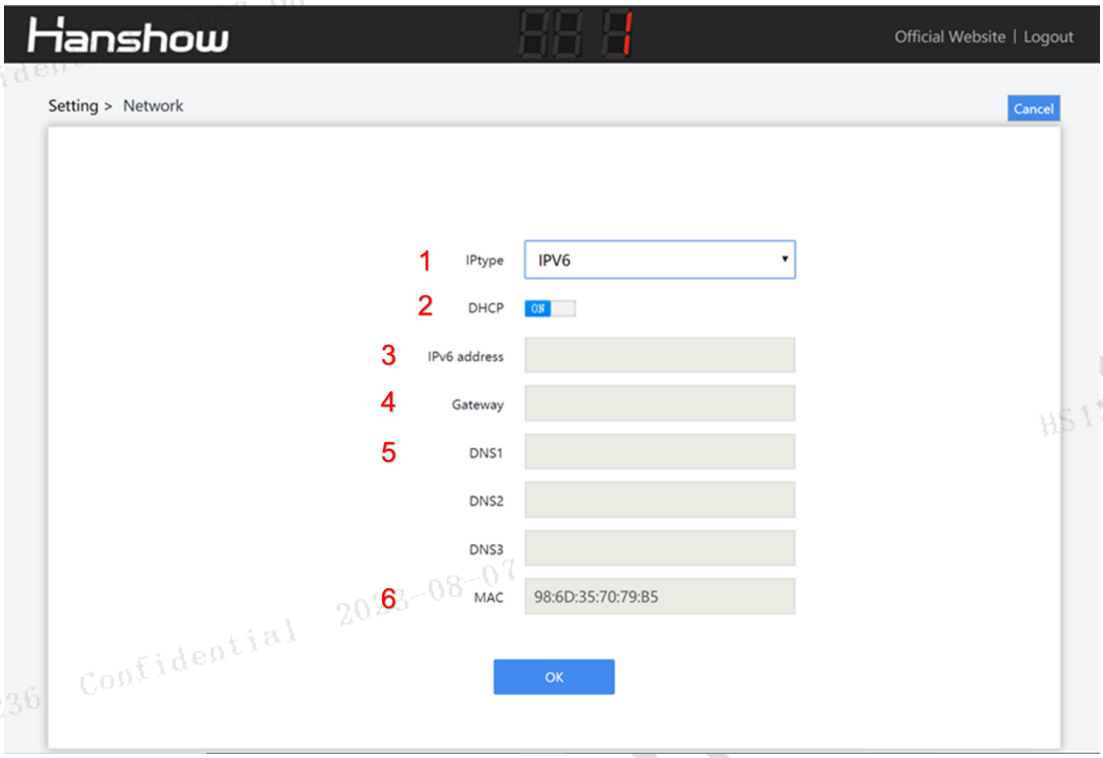

Figure 4-13 Network configuration page 2

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The configuration items are illustrated as shown in *Table 4-4*.

Table 4-4 Configuration option description

NO.	CONFIGURATION ITEM	DESCRIPTION
1	IP type	Support IPv6/IPv4 dual protocol stacks. To configure the parameters when selecting IPv6.
2	DHCP	● When set to OFF, IP address should be configured manually. ● When set to ON, the device is DHCP client, and IP address should be get from DHCP server.
3	IPv6 address	Configurable when DHCP is OFF.
4	Gateway	Configurable when DHCP is OFF.
5	DNS	Domain Name Server (DNS), DNS1: Primary DNS server; DNS2: Secondary server; DNS3: Secondary server. Must be set when the ESL-Working address is configured as domain name address; Enable DHCP, to get DNS from DHCP.
6	MAC	Unique MAC address, refer to nameplate.

NOTE: The modified network settings take effect immediately; you need to re-enter the set URL to access the web.

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4.2.2.3 **ESL-Working setting**

This can set IP address and port number of ESL-Working, as shown in *Figure 4-14*.

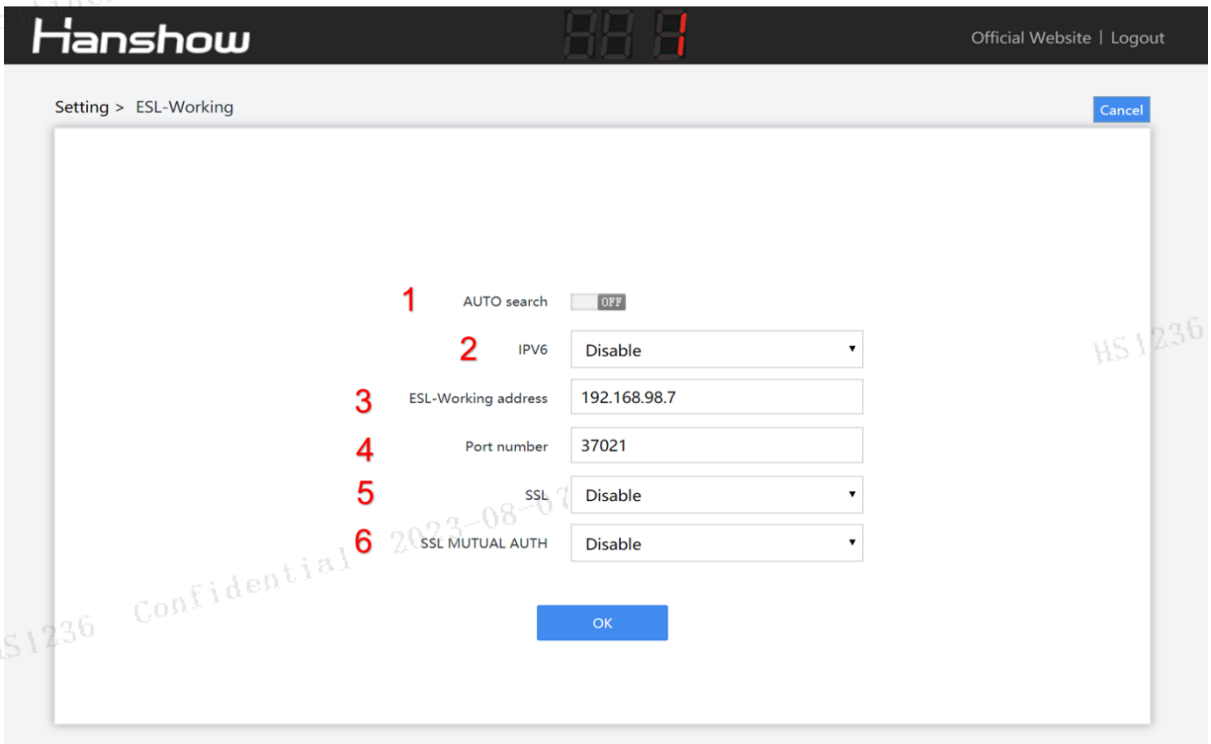

Figure 4-14 ESL-Working setting

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Each configuration item is illustrated as shown in *Table 4-5*.

Table 4-5 Configuration option description

NO.	CONFIGURATION ITEM	DESCRIPTION
1	AUTO search	● When set to OFF, you need to set the related ESL-Working parameters manually. ● When set to ON, the AP will automatically search and connect to ESL-Working address in local area network (LAN).
2	IPv6	● Disable represents ESL-Working address can be configured as IPv4 format address (It is configurable when AUTO search is off). And an error will be reported if the configuration format is incorrect. ● Enable represents ESL-Working address can be configured as IPv6 format address (It is configurable when AUTO search is off). And an error will be reported if the configuration format is incorrect.
3	ESL-Working address	The IPv4 or DNS in ESL-Working is configurable when AUTO search is OFF.
4	Port number	Port number of ESL-Working: ● When AUTO search is set to ON, it presents the target ESL-Working address searched by the AP. ● When AUTO search is set to OFF, it presents the target ESL-Working address accessed by the AP.
5	SSL	Whether to use SSL to connect to ESL-Working securely.
6	SSL MUTUAL AUTH	Whether to verify the ESL-Working certificate. This feature is valid only when SSL is enabled.

NOTE:

- **Confirm whether the DNS server in Network setting is correct after changing the DNS of ESL-Working.**
- **Confirm whether the port number is correct after SSL is enabled. Generally, the port number connected by SSL or non-SSL is different.**
- **The modified ESL-Working information will take effect about 30s later, no need to restart the AP.**

⚠NOTICE: You need to configure ESL-Working address manually when ESL controller and ESL-Working are used in different network.

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4.2.2.4 **Reboot AP**

Click **Reboot AP**, click **OK** on pop-up box, the device will reboot. Reboot AP takes about 1min, as shown in *Figure 4-15*.

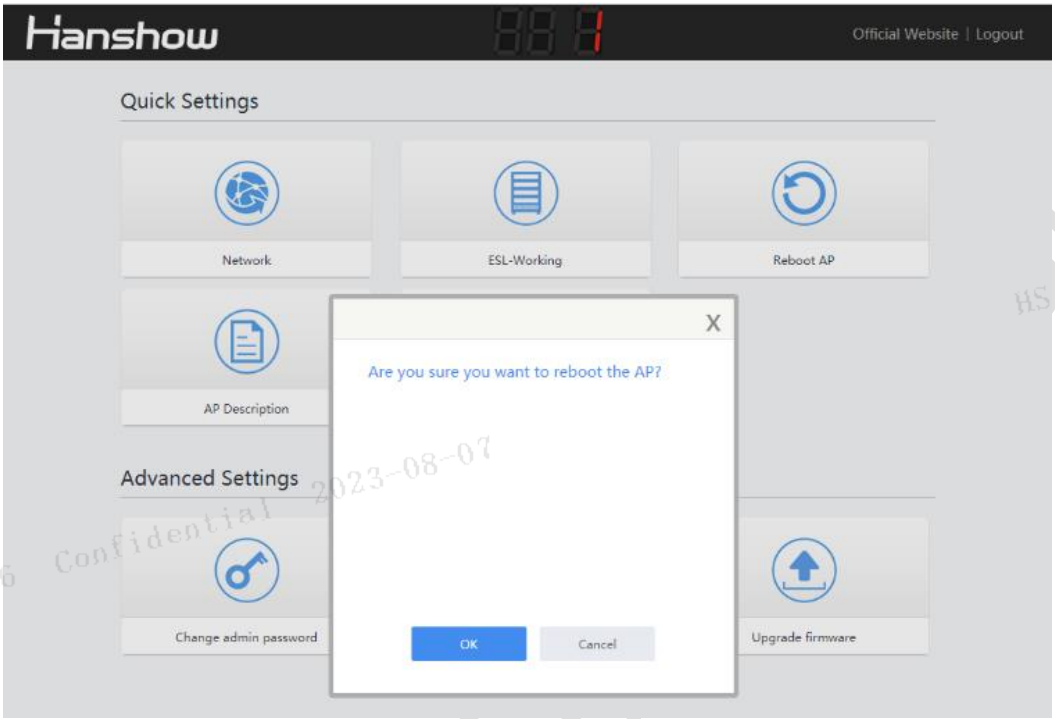

Figure 4-15 Reboot device

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4.2.2.5 **AP description**

This can add custom information for AP record and recognition, as shown in *Figure 4-16*.

Figure 4-16 AP description

4.2.2.6 **NTP setting**

NTP setting can add custom device acquisition time, easy to synchronize time in time zone, as shown in *Figure 4-17*.

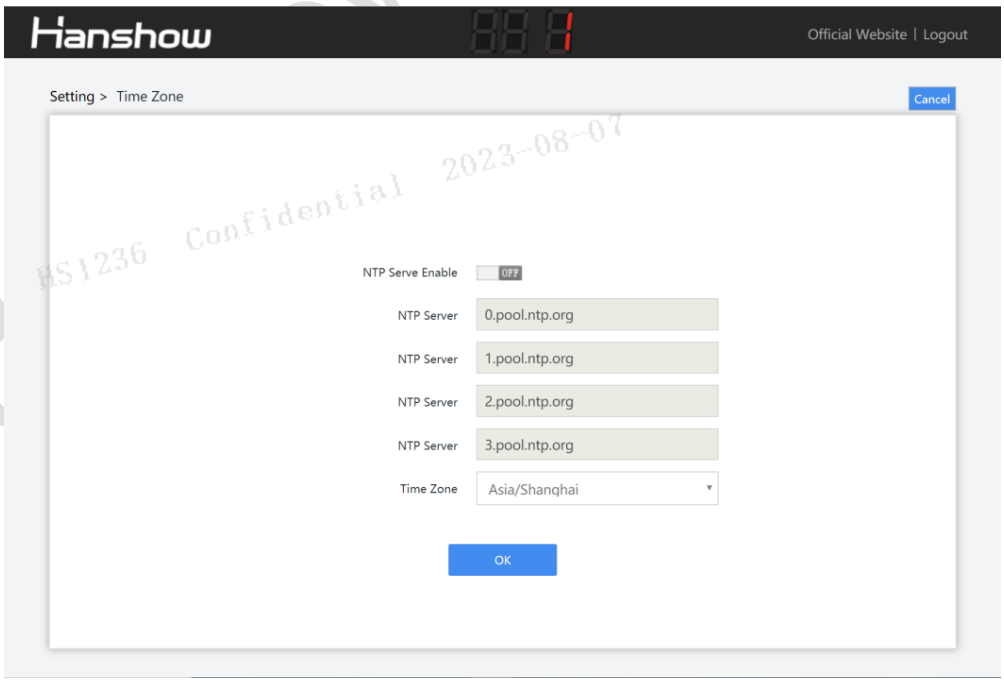

Figure 4-17 NTP setting

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4.2.2.7 **Change admin password**

This is used for changing login password, as shown in *Figure 4-18*.

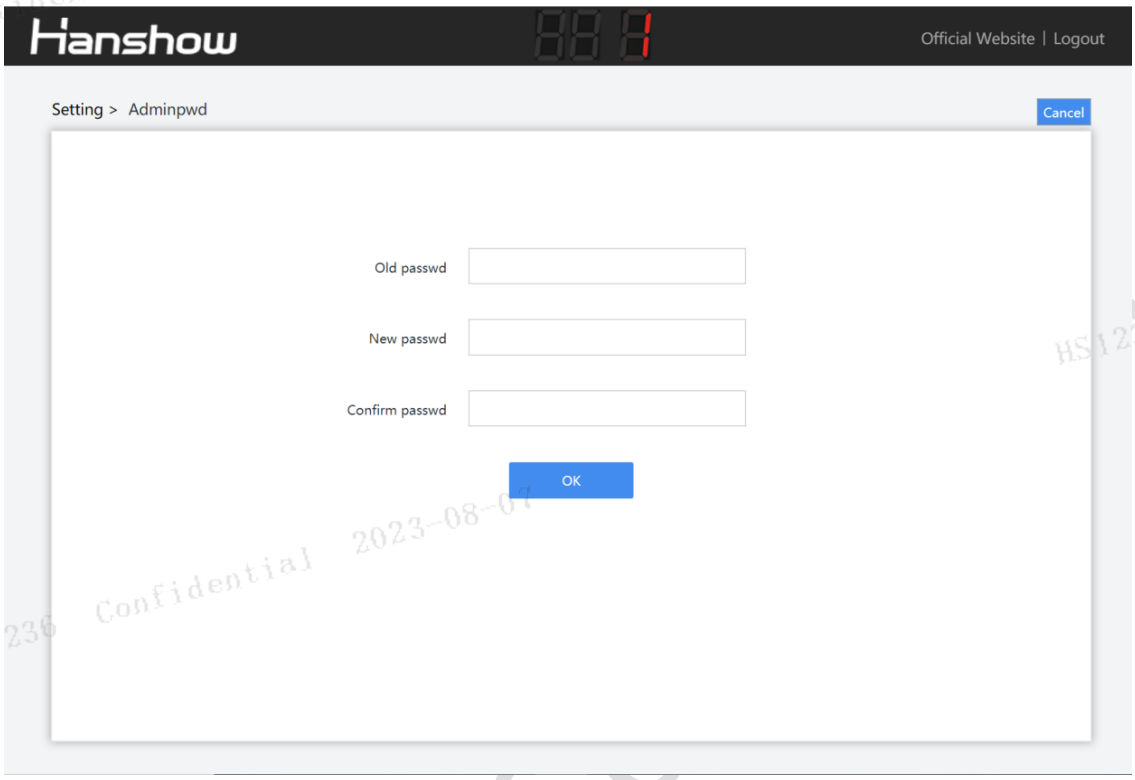

Figure 4-18 Change password

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4.2.2.8 **Restore factory settings**

Click **Restore factory settings**, click **OK** on pop-up box, the device will restore factory settings and reboot. Restore factory settings takes about 1min, as shown in *Figure 4-19*.

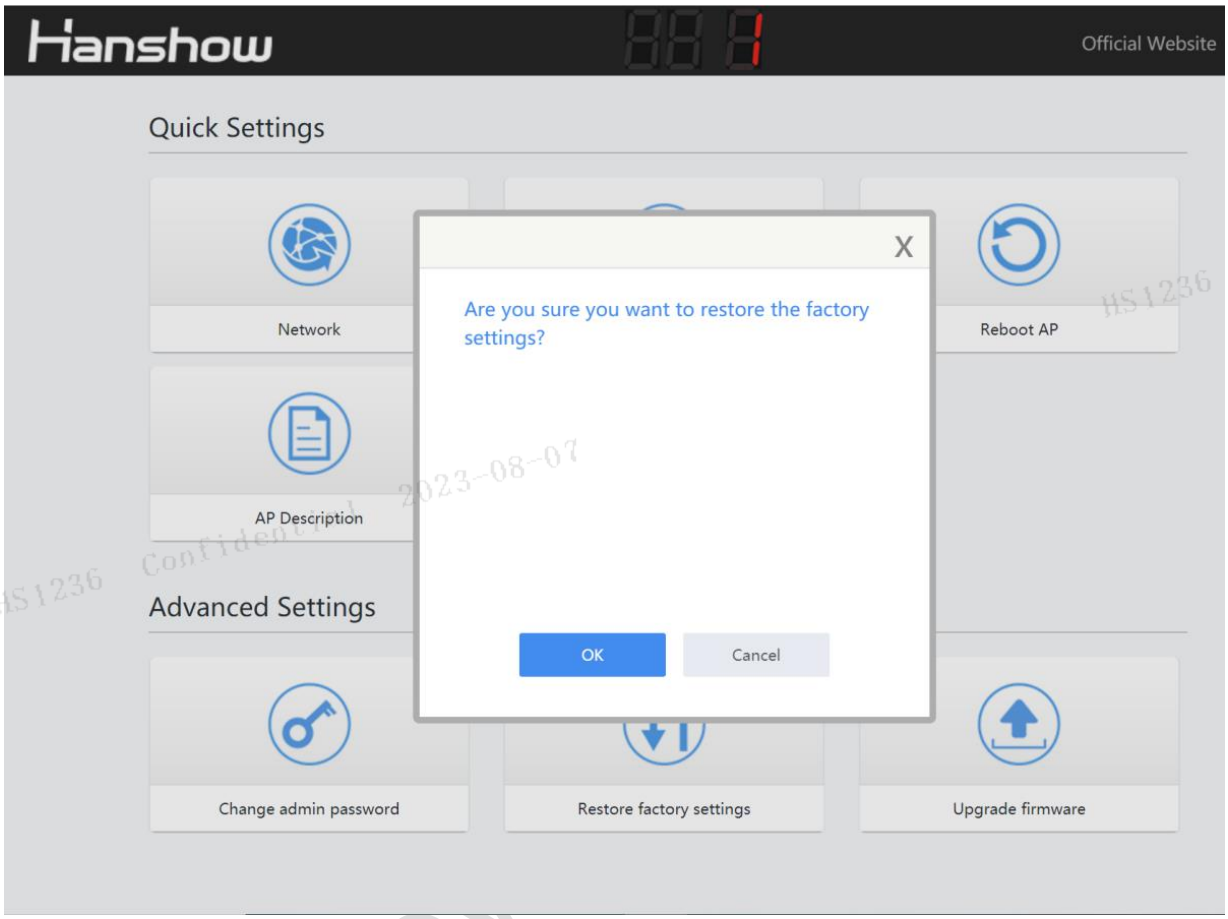

Figure 4-19 Restore factory setting

NOTE:

- Same as the reset key action.
- Don't cut off the power during the process, otherwise the device will be damaged.

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4.2.2.9 **Upgrade firmware**

HS_C09979 upgrade is used to online upgrade for main system and RF subsystem. It supports local upgrade and remote upgrade.

- Local upgrade: Do not use other AP models' upgrade package in our company for upgrade testing, avoiding incorrect upgrade.
- Remote upgrade: Currently, it is only available to LAN environment. If cross-network segment upgrade is required, you need to do port mapping in advance.

  ⚠**NOTICE:**

  - **Don't cut off the power during the upgrade, otherwise the device can be damaged.**
  - **To upgrade main PCB and four-way RF sub-PCB during the upgrade.**
  - **The entire upgrade procedure takes about 5min.**

For more information, please refer to *Hanshow ESL Controller HS_C09979 Upgrade Manual.*

4.3 Workflow

Specific workflow is as follows:

1. Before using HS_C09979, please confirm if Wi-Fi AP has 5V/500mA USB2.0 or above port, and if the software can support USB virtual Ethernet port feature.
2. Check if power cable and network cable are connected properly.
3. After power is on, do not boot HS_C09979 until Wi-Fi AP is booted (this takes about 5 minutes).
4. The power indicator on front panel lights on after HS_C09979 powered-on, and then HS_C09979 system starts to take about 1min.
5. After system startup, Follow the section of *4.2 Parameter setting* to configure relevant parameters accordingly.
6. HS_C09979 will automatically connect to ESL-Working after the correct configurations. If success, the indicators will flash green; if failed, the prompt messages appear. HS_C09979 will connect to ESL-Working regularly.
7. HS_C09979 will perform data communications such as heartbeat packet reception, data transceiver and ESLs inquiry.

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5 FAQ

5.1 Hardware FAQ

5.1.1 ESL controller cannot be powered on, LED does not work

Handling procedure:

- Confirm whether the device has USB port that can support virtual Ethernet port feature.
- Confirm whether USB power supply device can support at least 500mA supply current.
- Confirm whether Wi-Fi AP is powered and operates normally.
- Confirm whether Wi-Fi AP related parameters are configured correctly, e.g. whether USB port is enabled. Specific configuration steps please refer to your Wi-Fi AP configuration guide.

If the device still cannot be powered on after all the above mentioned steps are confirmed, then it must be device exception. Please contact technical support personnel or your agent to replace the device.

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6 Return and repair instruction

6.1 Return and repair process

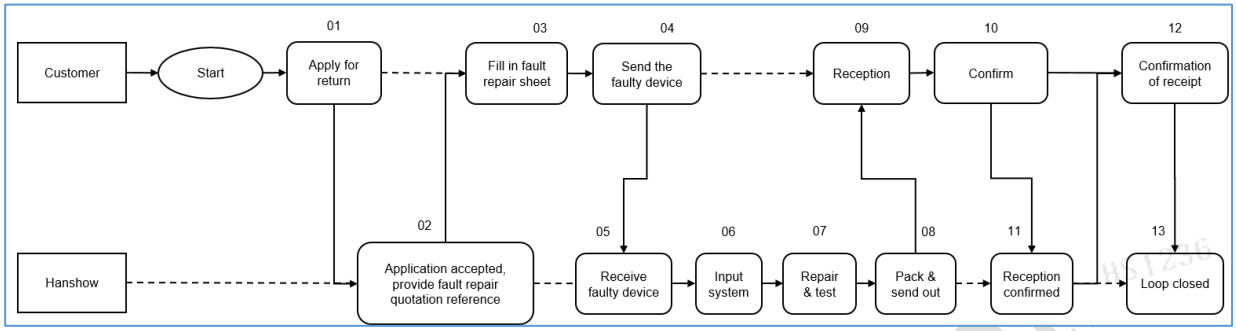

Figure 6-1 Return and repair process chart

6.2 Repair time limit

Repair of faulty device: since the faulty device is received by Party B and Party B confirms that the faulty device is within repair range; or since Party B receives repair expense, the faulty device shall be repaired within 30 days. After that, the repaired device shall be sent to the designated place by Party A. In case Party B fails to repair the faulty device, Party B shall provide substitute with the same capacities.

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7 Maintenance

Please follow below advices when installing and using HS_C09979 ESL controller.

Table 7-1 Precautions and suggestions

Items	Description
Environment requirements	● Keep AP operating in standard temperature and humidity. ● The AP operates best in normal indoor conditions. To prevent circuit damage, avoiding poor ventilation or other extreme conditions. ● Do not install the AP in an environment with dust, poisonous gases, flammable or explosive objects, or electromagnetic interference.
Safe precautions	● Take proper measures to avoid AP damaged and installer injuries. ● Keep the AP clean. ● Clean the device with a dry or damp soft cloth. Do not clean the device with wet cloth or liquid directly. ● Ensure the ventilation hole is not blocked. ● Unplug the power first when you need to move or clean the device. ● Place the AP in a dry and flat position away from any liquid. ● Keep the device away from water or damp places to avoid water or moisture entering the case.
Pre-installation check	● Use network cable tester to check the network cable is normal. ● All power cables are not short-circuited or reversely connected and must be intact with no damage. ● Labels on cables are clear and correct. ● Ensure the ground conductor is intact. ● The Wi-Fi device you are using must have USB interface that can support virtual Ethernet port feature. ● No structural interference between the Wi-Fi device you are using and HS_C09979. ● Confirm that USB power supply device can support at least 500mA output current and can support USB virtual Ethernet port feature.
Installation scenario	● Try to reduce the number of obstacles such as walls between the AP and user terminals. ● Limit the metal shielding around the AP to prevent cage interference effect.

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Items	Description
Installation distance	● If the shelf height is ≤3m, it is recommended that the installation distance of two Hanshow APs is about 25m, and at least 5m. ● If the shelf height is 3m ~ 5m, it is recommended that the installation distance of two Hanshow APs is about 20m and at least 5m. ● If shelf height exceeds 5m, the installation height of AP is determined according to actual situation after on-site field investigation. ● Keep the distance more than 2m from operator 4G mobile communication antenna. ● The AP installation height should be higher than shelf to avoid signal shielding. ● When mounting the ESL controller into the ceiling horizontally, the ESL controller shall keep at least 6cm away from the ceiling.
Network settings	● It is recommended to use the 5GHz frequency bands of your Wi-Fi AP, instead of using the 2.4GHz frequency bands. ● If Wi-Fi AP is 2.4GHz, recommended to set Wi-Fi channel to 1, 6 or 11. ● If Wi-Fi AP is 2.4GHz, recommended to stagger the update time with ESLs to achieve optimal performance. ● Hanshow AP may be limited or affected by other IoT devices that share the 2.4GHz frequency-band such as Wi-Fi, BT or Zigbee.
Post-installation check	● Install the AP firmly on the ceiling to avoid AP falling off and damaged. ● The power cable or network cable is intact and not spliced. ● The AP runs properly.

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8 Warranty policy

The product is guaranteed for 1 year since it is delivered. If you still need Hanshow's after sales services after the warranty period, please provide Hanshow with a warranty extension agreement in written form 1 month before warranty period expires.

9 Contact information

Table 9-1 Hanshow after-sales contact information table

SERVICE METHOD	DESCRIPTION
Hotline	● China: 400-0365-305； ● Netherlands: 0800-022-5037； ● Belgium: 0800-71-335； ● France: 0800-91-7602； ● Thailand: 1800-011-185；
Email	support@hanshow.com
Work order system	https://service.hanshow.online/
WeChat Official Account	

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10 FCC ID warning

10.1 Warning for nameplate

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

10.2 Warning for product manual

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.

For body-worn operation, the device has been tested and meets the FCC RF exposure, the maximum SAR value is 0.342 W/Kg at 0mm.

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11 IC STATEMENT

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

(1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils

radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

For body-worn operation, the device has been tested and meets the IC RF exposure, the maximum SAR value is 0.226 W/Kg at 0mm.

Pour une utilisation corporelle, l'appareil a été testé et répond à l'exposition RF IC, la valeur maximale du das est de 0,226 W/Kg à 0mm.

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