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ESL ACCESS POINT HS_C09851
PRODUCT MANUAL

Document Version 01

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Target Audience

This document introduces the uses, functions, hardware parameters, performance characteristics and precautions for Electronic Shelf Labels Access Point. This manual is applicable for the below engineers:

- Test Engineer
- Technical Support Engineer
- After Sale Technical Support Engineer

Symbolic Description

Icon	Description
	Reader should pay better attention
	Explanation for the context, making the document more easily accessible
[X-X]	Explanation of terms

Explanation of Terms

Proper Name	Full Name	Explanation
AP	Wireless access point	ESL Access Point
ESL	Electronic shelves label	ESL

Catalog

1 Overview

1.1 Instruction to ESL Access Point

HS_C09851 is the second generation of ESL Access Point system developed by HANSHOW. It operates in the 2.4G wireless frequency range and is responsible for data transmission and information exchange between ESL-Working system and ESL system. The second-generation ESL Access Point system continues the basic functions of the first generation ESL Access Point system, and greatly improved the processing and carrying capacity of the system on the basis of first generation. Characteristics as follows:

- Main processing system: Embedded Linux operating system, responsible for data interaction with ESL-Working system, including ESL Access Point system's registration, heartbeat reception, data transmission;
- Radio frequency system: Modular RF subsystem, supporting four RF subsystems, supporting parallel communication, improving the communication success rate, reducing the packet loss rate and improving the channel utilization;
- Support first generation EPL, second generation EPD, 3rd generation EPD, 3rd generation LCD series ESL.

1.2 System Architecture and AP Functions

ESL system consists of WebShop, ESL-Working, Wireless access point (AP), Electronic shelves label (ESL) and handheld terminal (PDA). ESL Access Point is responsible for data interaction between ESL and ESL-Working. System architecture is shown as figure 1:

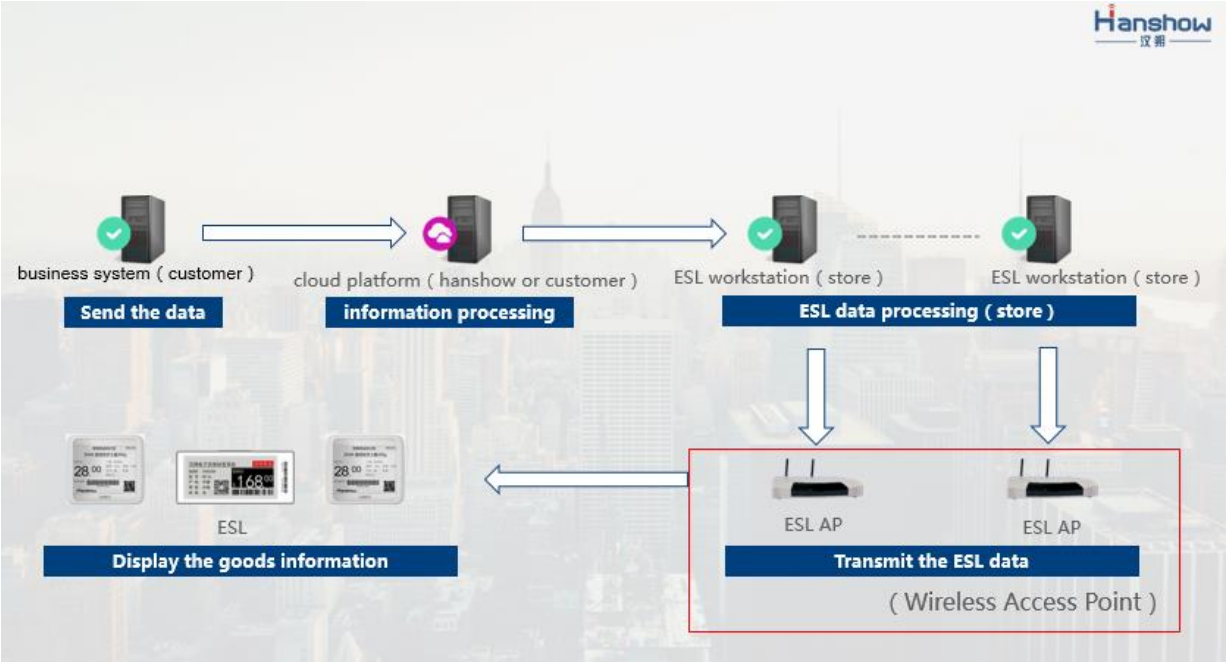

Figure 1-1ESL System architecture diagram

HS_C09851 is an important part of Hanshow electronic shelf label system, it as a data transmission link responsible for the important task of data forwarding:

（1） Forwarding uplink data：The ESL Access Point connected to ESL-Working over a wired network, to sent send the price changes, inventory, templates and other data to ESL;

（2） Forwarding downlink data：The ESL Access Point operates in the 2.4G protocol specification, based on the ESL radio protocol standard to ESL-Working platform to forward ESL heartbeat and other information.

1.3 HS-C09851 Characteristics

- Linux OS: Embedded Linux operating system, support network upgrade
- 4-way antenna: support 4-way antenna work at the same time
- Compatibility: Support LCD and EPD series ESL
- A variety of power: support POE and AC power adapter power supply
- LED light: LED light real-time display working status

2 PRODUCT ARCHITECTURE

2.1 Overview

ESL Access Point using modular design, HS-C09851 has four receiving and transmitting module, responsible for the transmission of wireless data; and it can interact with data of the price tag and remote control. data exchange.

2.2 Configuration and Appearance

2.2.1 Basic Configuration

HS_C09851 Configuration	
Power Module	
Input voltage	12V DC
Rated current	1A
Rated power	12W
Other	Overload / overvoltage / over temperature protection
Host Processor Module	
CPUFreq.	720MHz ARMprocessor
Storage	512M FLASH + 512M RAM
OS	Embedded Linux system
RF（2.4G Module）	
Working Freq.	2.402～2.480GHz
Channel bandwidth	500KHz
Modulation	GFSK
Transmission rate	Uplink：500K bps Downlink：100K bps
Antenna gain	0dBi（selectable）
Antenna feature	4- Rod antenna
Super-high sensitivity	-95dBm at 500Kbps -97dBm at 100Kbps
Ethernet Module	
Rate	100M（adaptive）
Self-negotiation	Support
Auto MDI/MDI-X	Support
DHCP	Support
POE Module	
Input voltage	36 ~ 57V DC
Output voltage	12V
Current	1A
Max power	12W

Standard	IEEE 802.3 , pre-standard(legacy) POE compatible
Power consumption	
Idle state power consumption	12V，300mA
Working state maximum power consumption	12V，450mA

2.2.2 Physical interface

Figure 2-1 Appearance of second generation ESL Access Point

Note

- ESL Access Point antenna, different batches will be different without affecting the transmission performance

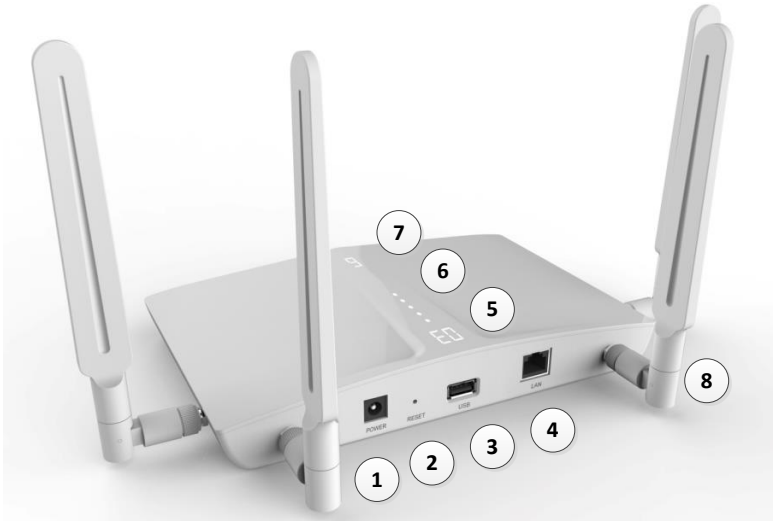

Figure 2-2 second generation ESL Access Point physical interface diagram

According to the physical interface diagram of the second generation ESL Access Point, the corresponding name and function of each interface are shown in Table 2-1.：

Table 2-1 AP interface and function description

Interface	Name	Functional description
1	Power source adaptor interface	12V-1A standard adapter access, Hanshow provide standard 12V adapter
2	Reset button	Restore factory settings button，Press this button for more than 5 seconds, the configuration can be reset. After reset, the system automatically loads the default settings; do not need to restart the ESL Access Point. Factory parameter see "Configuration Guide"
3	USB Interface	Type A USB interface, standard USB device is adapted.
4	Ethernet interface	Standard 100M Ethernet interface, connected to customer system via wire. POE powered supported.
5	Two digits Nixie light	Green, and displays Access Point ID. (The direction of Nixie light is aligned to interface direction. The Nixie light is correctly displaying when interfaces is facing up)
6	5 LED lights	5 LED indicators for working status
7	One digit Nixie light	Red indicates the Access Point condition. (The direction of Nixie light is aligned to interface direction. The Nixie light is correctly displaying when interfaces is facing up)
8	ESL Access Point antenna	Four antennas for 2.4GHz wireless communication. Can support synchronous transceiver mode, this mode is completely controlled by the system, do not need artificial configuration

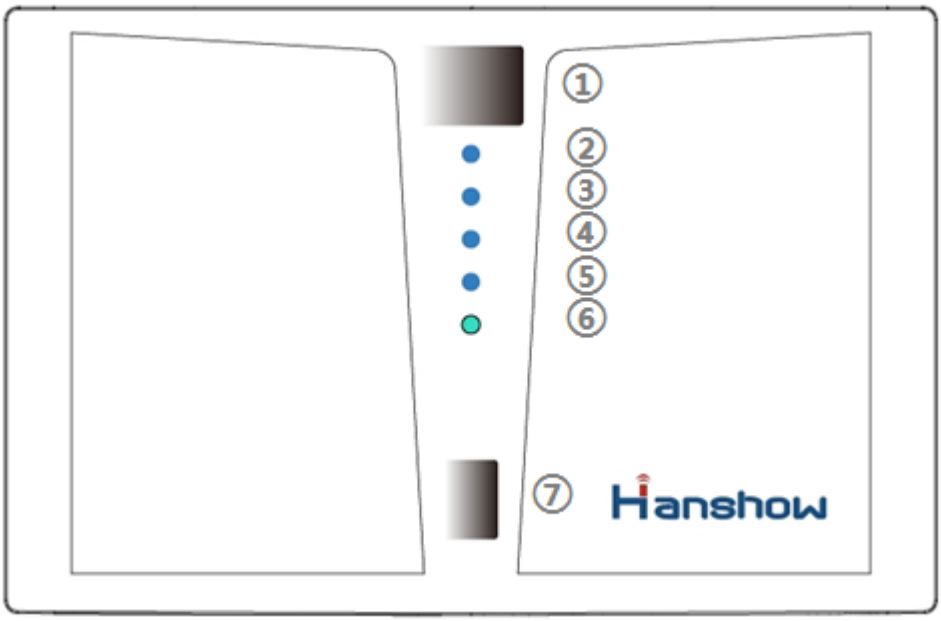

Figure 2-3 ESL Access Point front panel diagram

Table 2-2 ESL Access Point front panel

Number	Name	State	Meaning
1	Access Point serial number displayer	On	The ESL Access Point is connected to esl-working; the number displayed is the ID number of the current ESL Access Point，range 1 – 99.
		Off	The ESL Access Point is not connected
2,3,4,5	RF module indicator	On	The corresponding radio module is in the receive data state
		Off	The corresponding radio module is in the idle state
		Flicker	The corresponding RF module is in the data transmission state
6	Power Indicator	On	Power on
		Off	Power off
7	Access Point status indicator	On	The ESL Access Point is abnormal. The displayed number is the corresponding error code (see error code meaning)
		Off	The ESL Access Point system is operating normally

Caution

- POE and DC power supported
- IP address and MAC address are default setting. IP address can be modified on configuration page.

2.2.3 AP Appearance Parameters

Table 2-4 ESL Access Point appearance parameters

Materials	
Face shell and bottom shell	ABS plastic material
Indicator lamp cover	Translucent PC
Dimension	
Length（mm）	218.2
Breadth（mm）	142.1
Height（mm）	38
Weight	
Overall with packaging（g）	934
Product Weight（g）	462

3 ESL ACCESS POINT INSTALLATION

3.1.1 Installation requirements

In actual use, the ESL Access Point should be installed in a higher position to achieve better transmission and coverage, as shown in Figure 3-1.

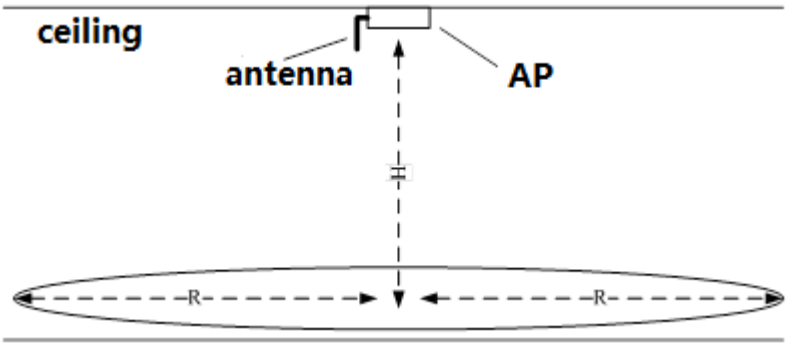

Figure 3-1 ESL Access Point installation diagram

Note: the H in the diagram, is suggested to be between 3 to 3.5 meters to cover a area of raduis of 15 meters

3.1.2 Accessories

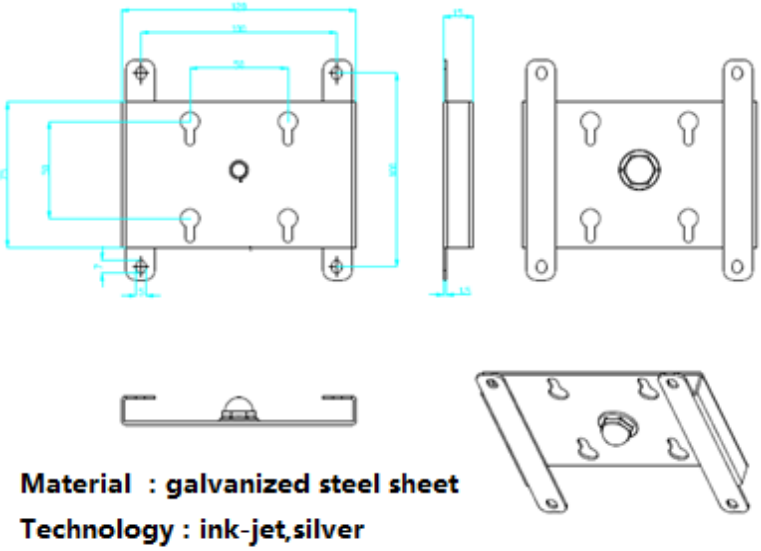

Figure 3-2 ESL Access Point installation accessories diagram

Figure 3-2 is the ESL Access Point standard installation accessories structure; recommend the use of hanging installation, the assembly diagram shown in Figure 3-3.

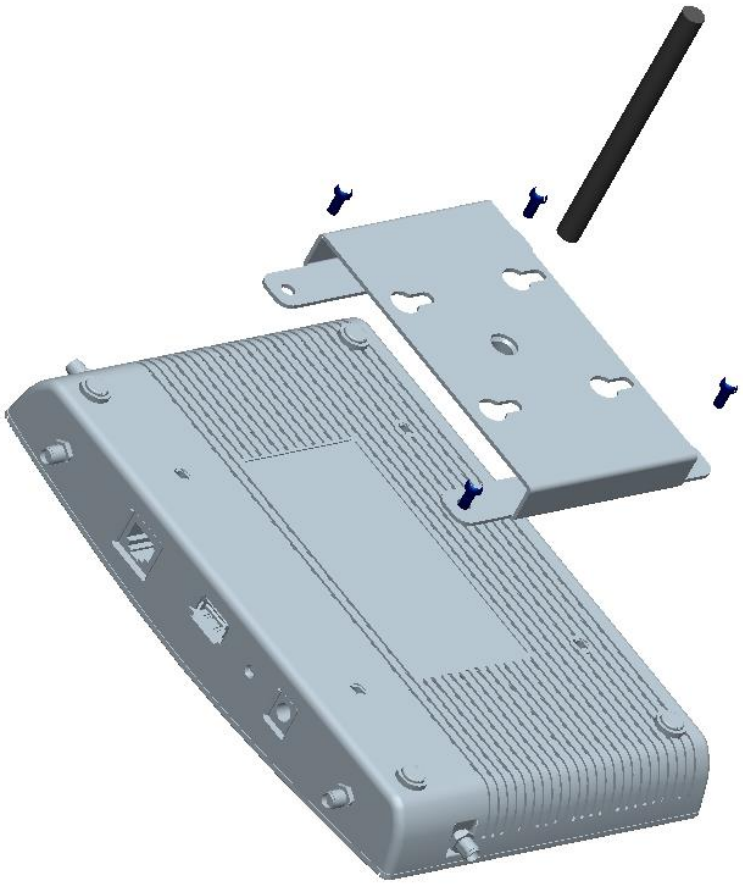

Figure 3-3 ESL Access Point mounting accessories

Note

- Accessories are to set the Access Point up on the ceiling.

4 PRODUCT FUNCTIONS

HS-C09851 Host function：

（1） RF sub-system: embedded processing unit, individual RF module

（2） Display：Nixie light and LED display for Access Point ID, working condition and error code display

（3） Interface：power source, reset button, USB interface, Ethernet interface

（4） Upgraded：software of host processing system and firmware of RF sub-systems support interface and webpage upgrading

（5） Configuration：Settings on webpage

5 ESL ACCESS POINT CONFIGURATION

The Access Point support http page configuration. Login coorespoding webpage via IP address to modify the settings of Access Point. For example, login http:192.168.51.100 for the Access Point IP address is 192.168.51.100.

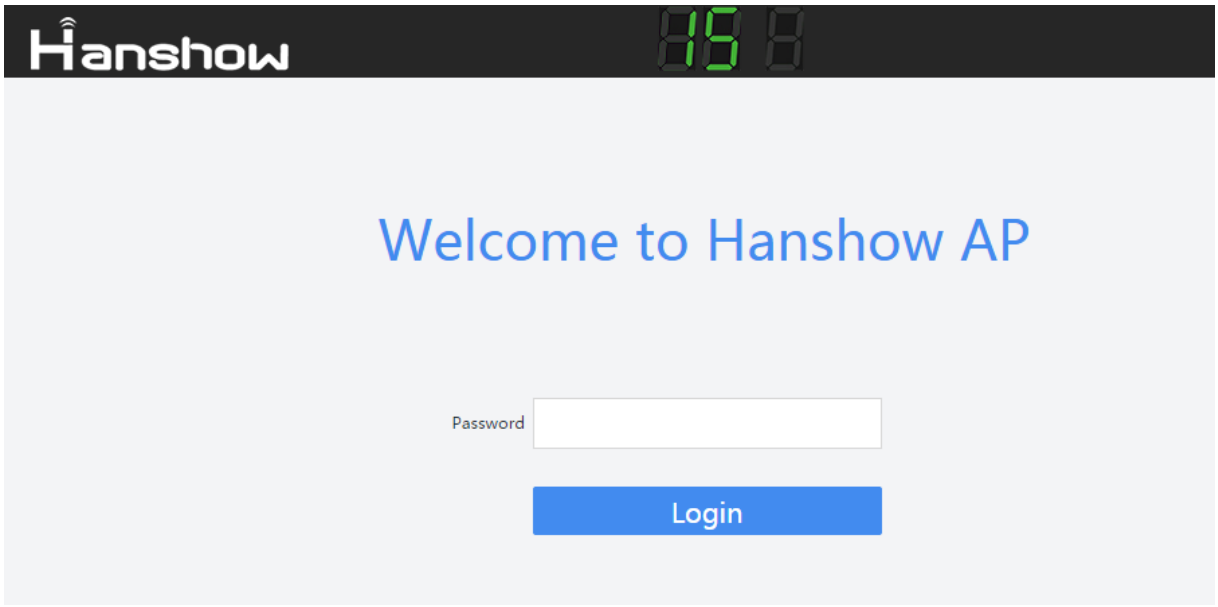

Figure 5-1 ESL Access Point configuration landing page

Default password：admin. Enter the password to log into the configuration page, as follows:

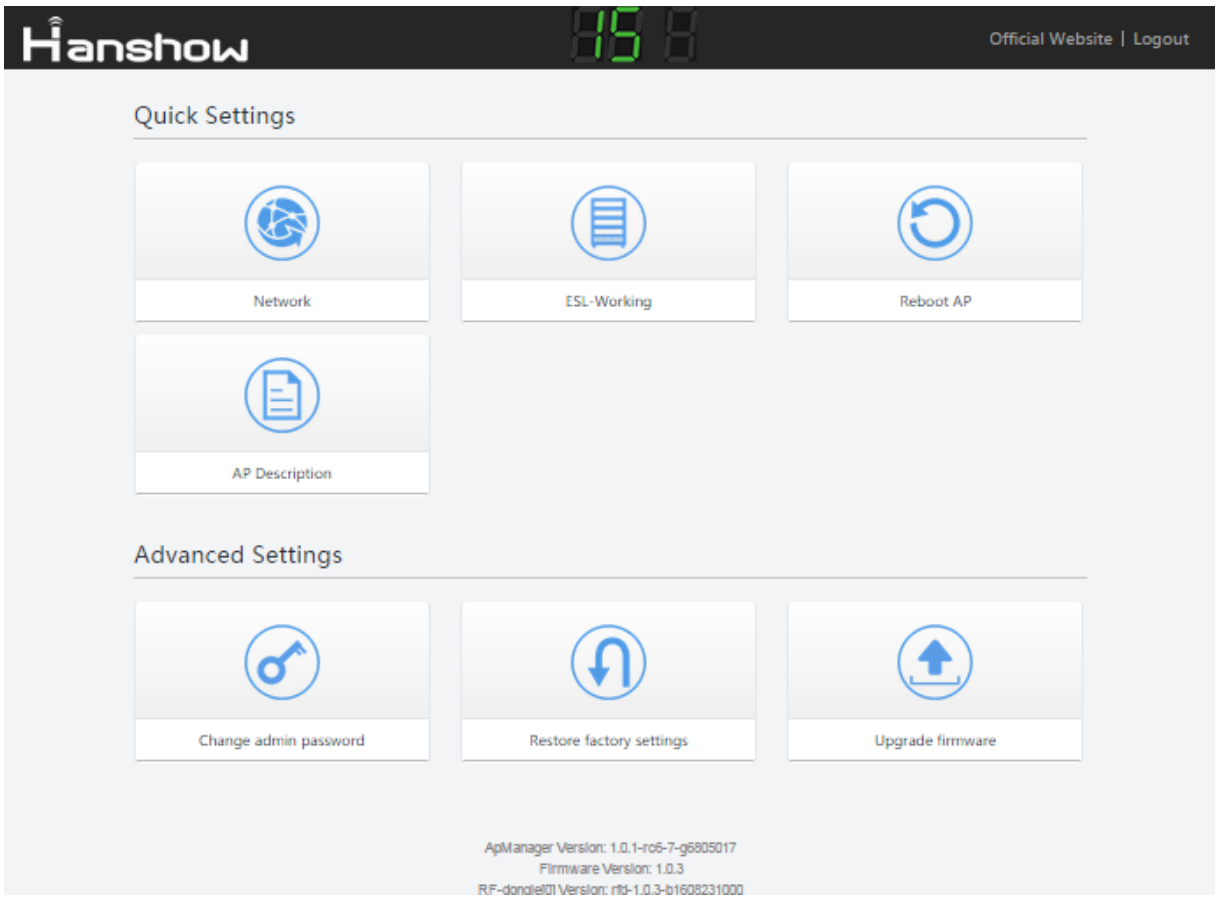

Figure 5-2 ESL Access Point shortcut design interface

The configuration page contains:

（1） Network configuration: Access Point network settings, like DHCP switched IP address, subnet mask, etc.

（2） ESL-working configuration: set the ESL-working system IP address and port.

（3） Restart Access Point: reset Access Point software.

（4） Change password：change the login password.

（5） Restore factory settings：reset all the Access Point settings.

（6） Upgrade system: upgrade the software of Access Point system and RFID sub-systems.

6 HOW TO USE

（1） Please plug in the power source and network wire.

（2） The system is working when the Access Point is powered by either 12V DC or POW adaptor and green light is on.

（3） The starting up time is approximately 40 seconds. All the LEDs will light up once when complete starting up.

（4） Please first configure the Access Point IP and ESL-working system IP as described hereinbefore.

（5） The red Nixie light will keep displaying 1 and try to make connection to the ESL-working system at a regular time unless it is successfully connected

（6） When connected to the ESL-working system, the two digits Nixie light will display the Access Point ID. The Access Point is now capable of communication operation like receiving heart-beat, data communication, ESL query, etc.

7 PACKING LIST

7.1 Packing diagram

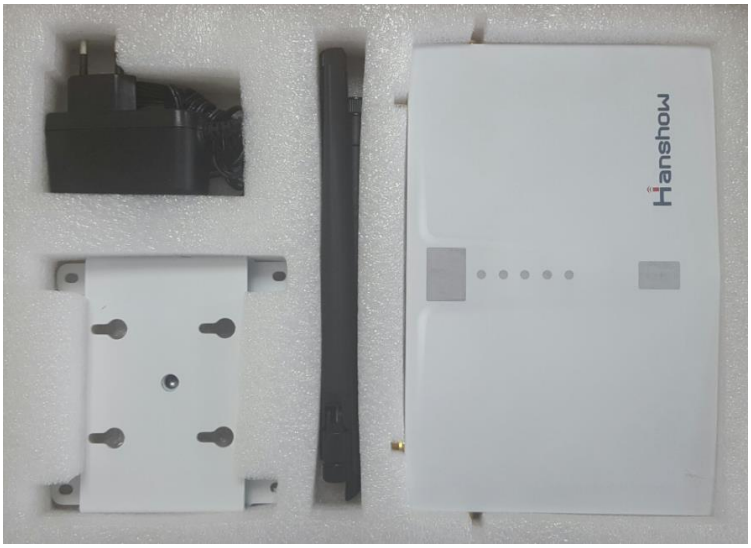

Figure7-1ESL Access Point package

7.2 Pack Contents

Package includes: 1 ESL Access Point, 4 white antennas, 1 AC-DC 12V power adapter, 1 mounting kit and 5 screws.

8 NOTICE OF PERATION

8.1 Installation

Caution

- Please use the standard power adapter;
- Installation height of 3 to 3.5 meters;
- ESL Access Point covers a radius of 15 meters;
- ESL Access Point to avoid placing metal interference around the periphery. In particular the need to avoid the formation of cage-like interference effects;
- ESL Access Point installation must be firmly installed to avoid loose off.

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.

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

NOTE: 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 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.