



Hanshow Nebular Ultra-WQ Series Product Manual

V1.0.0

HS-ESL-EPDN002

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ABOUT THE MANUAL

This document describes Nebular Ultra-WQ series, including features, specification, packaging, and precautions.

Please read this manual carefully before using the product, and retain it 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; Benelux: +800-808-36000; France: 0800-90-2530; Germany/Poland: +800-836-86836; USA: 001-866-9570989; Australia: 0061-1800-953008) directly, we will provide you with multi-channel technical services.

TARGET USERS

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

- Testing Engineer
- Technical Support Engineer
- After Sales Engineer
- Installation Engineer

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

Acronym	Expanded form	Description
PriSmart	PriSmart Smart Retail System	Manage all store product data and issue price update command, as well as support multi-store management.
ESL-Working	ESL-Working System	Manage all the APs and ESLs in store, and ESL-Working 3.0 and above supports multi-store management.
AP	Wireless Access Point	Also called ESL controller that is used for data interaction between ESL-Working and ESL.
ESL	Electronic Shelf Label	Used for displaying product information like promotion information, price, and grade.

Table of Contents

1 Overview.....	1
1.1 System architecture.....	1
1.2 Features.....	2
2 Product view.....	3
2.1 Product appearance.....	3
2.2 Dimensions.....	5
3 Hardware performance	6
3.1 Specifications.....	6
3.2 Product nameplate.....	6
4 Packaging and accessories.....	7
4.1 Product accessories	7
5 Application scenarios.....	8
6 Precautions.....	8
6.1 Transportation considerations	8
6.2 Precautions for use.....	9
7 FCC ID warning.....	10
7.1 Warning for nameplate	10
7.2 Warning for product manual.....	10
7.3 portable device statements.....	10
8 IC statement.....	11
9 EU Regulations.....	12

1 Overview

The Nebular Ultra-WQ Series represents Hanshow Technology's independently developed next-generation ESL. This series utilizes e-ink displays and operates on the 2.4GHz wireless communication band to deliver multiple functions including price updates, page switch, and flashing. Featuring ultra-thin design, extended lifespan, and high-definition visual effects, the Nebular Ultra-WQ Series is widely applicable across traditional retail, new retail, department stores and fashion, pharmaceuticals and healthcare, as well as cultural and entertainment sectors.

1.1 System architecture

Hanshow ESL system includes Electronic Shelf Label (ESL), ESL Controller (i.e. Access Point or AP), ESL-Working, PriSmart/ShopWeb, Database, Integration server, CloudMonitor and Handheld Terminal (PDA), as shown in [Figure 1-1](#). Specifically, the ESLs are used for electronically displaying product information such as name and price, and services available for customers.

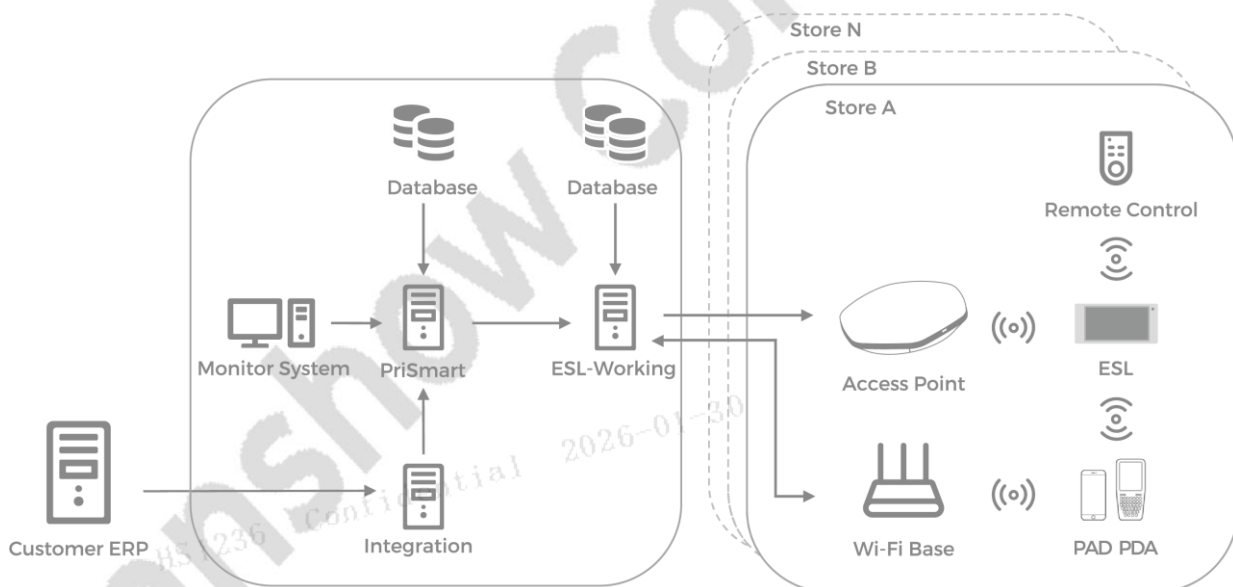


Figure 1-1 Hanshow ESL system architecture

1.2 Features

The features of Nebular Ultra-WQ series are as follows:

- Nebular Ultra-WQ ESLs come in 3 sizes: 1.6", 2.6" and 3.5".
- Display colors include: Black, White, Red and Yellow (Black-White display for freezer ESLs).
- Operating frequency band: 2,402MHz ~ 2,480MHz.
- IP68 waterproof and dustproof design.
- Built-in LED indicator: 7-color display assists in product location, promotion reminder, out-of-stock reminder, and low power reminder.
- Embedded NFC chip: Supports NFC function. NFC response distance is 10mm.
- 2.6" and 3.5" freezer ESLs support operation in low temperature range (-25°C ~ 0°C).
- Nebular Ultra-WQ ESLs support multiple functions, including binding/unbinding, updating, instant flashing, multi-page storage, page switching, geolocation, temperature collection, NFC function and so on.
- Supports AES-128 encryption.
- Supports OTA (Over-The-Air) upgrade.

2 Product view

This chapter describes Nebular Ultra-WQ series' appearance and mechanical dimension diagrams.

2.1 Product appearance

Figure 2-1 displays Nebular Ultra-WQ family:



Figure 2-1 The appearance of Nebular Ultra-WQ family

Each section of Nebular Ultra-WQ and its relative description is shown in [Figure 2-2](#) and [Table 2-1](#):

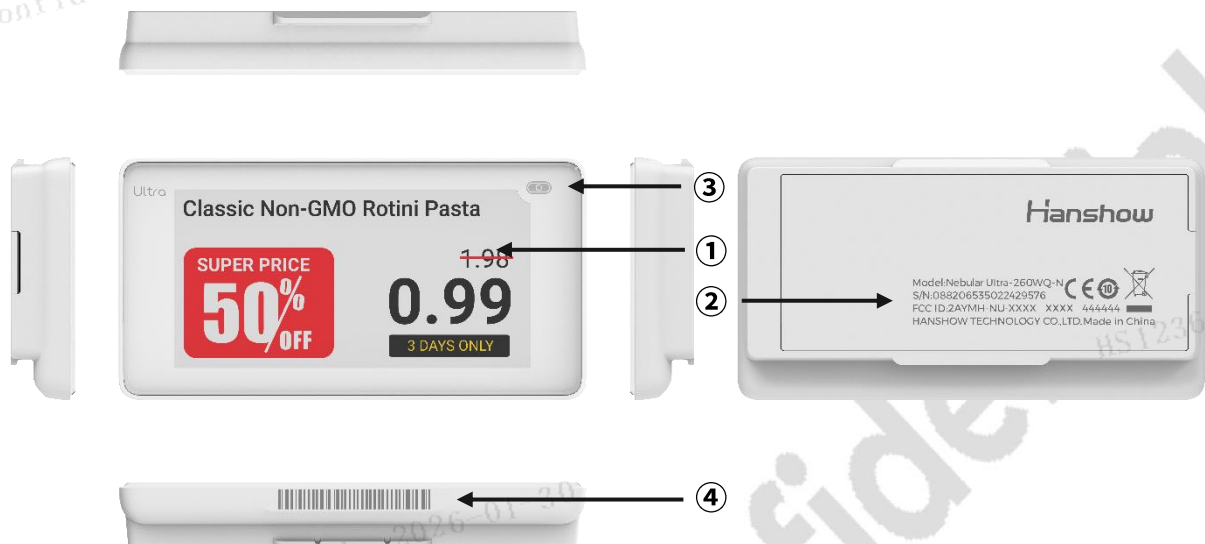


Figure 2-2 Key area of Nebular Ultra-WQ

Table 2-1 Each area description of Nebular Ultra-WQ

No.	Name	Description
1	LED indicator	Supports 7-color LED flashing.
2	Display area	Supports BWRY display on E-ink screen. ● Display texts, images, barcode, QR code and others. ● Product information display such as name, price, origin, unit, grade, phone number, barcode, and QR code. Supports customizable display position and font size. Supports 8-page storage and page switch functionality.
3	Nameplate	Product information mark, including model, S/N, and certifications such as CE.
4	Barcode area	18-digit barcode used for product binding and maintenance.

2.2 Dimensions

This section covers the dimensions of Nebular Ultra-WQ series:

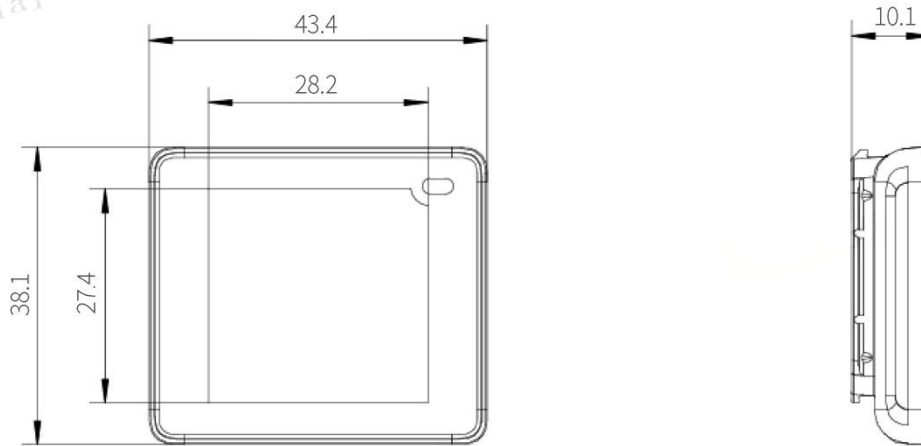


Figure 2-3 1.6" dimension

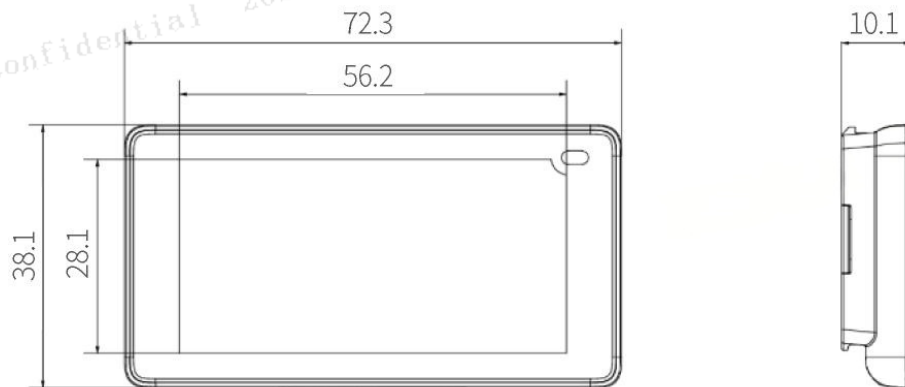


Figure 2-4 2.6" dimension

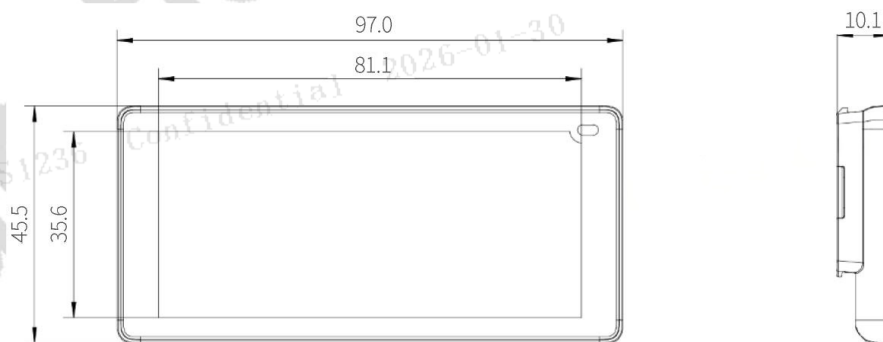


Figure 2-5 3.5" dimension

3 Hardware performance

3.1 Specifications

Table 3-1 lists the Nebular Ultra-WQ specifications:

Table 3-1 Nebular Ultra-WQ specifications

Name	1.6"	2.6"	3.5"	2.6" Freezer	3.5" Freezer
Dimensions (mm*mm*mm)	43.4*38.*10.1	72.3*38.1*10.1	97.0*45.5*10.1	72.3*38.1*10.1	97.0*45.5*10.1
Active display area (mm*mm)	28.2*27.4	56.2*28.1	81.1*35.6	56.2*28.1	81.1*35.6
Size (inch)	1.6	2.6	3.5	2.6	3.5
Resolution (pixel) ^[3-1]	200*200	296*152	480*232	296*152	480*232
DPI ^[3-1]	183	134	153	134	153
Display color	Black, White, Red, Yellow (only BW display for freezer ESLs)				
Viewing angle	Nearly 180 degrees				
Battery life ^[3-2]	Up to 10 years	Up to 15 years		Up to 10 years	
Page switch	8 pages				
Protection level	IP68				
Operating temperature (°C) ^[3-3]	0 ~ 40	0 ~ 40	0 ~ 40	-25 ~ 0	-25 ~ 0
Storage temperature (°C) ^[3-3]	0 ~ 40	0 ~ 40	0 ~ 40	-25 ~ 30	-25 ~ 30
Humidity (%RH)	45 ~ 65				

Note:

- **[3-1]:** Resolution and DPI vary depending on the screen provided by the screen supplier.
- **[3-2]:** Battery life is calculated based on the following scenarios: Room temperature (25°C) ESLs switch page twice a day; while freezer ESLs switch page once a day.
- **[3-3]:** Room-temperature ESLs operate within 0°C ~ 40°C, however, temperatures below 10°C might impact the ESL lifespan. Freezer ESLs operate within -25°C ~ 0°C.

3.2 Product nameplate

Taking 2.6" ESL as an example, *Figure 3-1* shows the nameplate of Nebular Ultra-WQ:



Figure 3-1 Nameplate of Nebular Ultra-WQ

 **Note:** Each ESL has a unique S/N number. The above is for reference only, actual label information might vary.

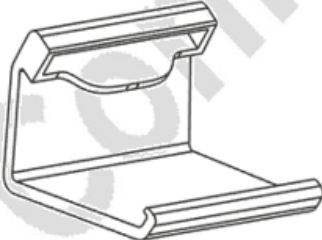
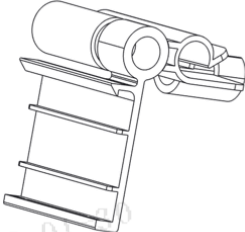
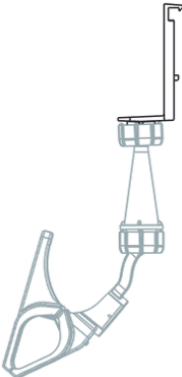
4Packaging and accessories

This chapter describes Nebular Ultra-WQ series' packaging and required accessories.

4.1 Product accessories

Common accessories of Nebular Ultra-WQ series are shown in [Table 4-1](#):

Table 4-1 Common accessories of Nebular Ultra-WQ series

Rail	
Table Stand	
T-hook	
Basket Clip	

5 Application scenarios

Nebular Ultra-WQ series is available to various zones and shelves of hypermarkets, supermarkets and retail stores. The ESLs are applicable to areas with different fixtures:

- Shelves
- Hooks
- Fences
- Tables

6 Precautions

During transportation and usage of the Nebular Ultra-WQ series, please note the following precautions.

6.1 Transportation considerations

Avoid the following considerations during transport:

- Ensure ESLs remain dry to prevent damage to electronic components.
- Do not crush ESLs to prevent screen damage.
- Maintain the ambient temperature below 40°C.

6.2 Precautions for use

Follow the precautions:

- The room-temperature ESLs operate best in normal operating and storage environment, 0°C ~ 40°C, 45% ~ 65%RH.
- The freezer ESLs operate best in normal operating, -25°C ~ 0°C, 45% ~ 65%RH and storage environment, -25°C ~ 30°C, 45% ~ 65%RH.
- Keep ESLs within the specified temperature range, otherwise ESL screens might be damaged and the battery life might be shortened.
- The output capacity will degrade at low temperature.
- Frequent communications or updates might shorten battery life during the use.
- Avoid dropping or tossing ESLs.
- Do not disassemble ESLs without permission.
- Do not disassemble ESL batteries.
- Do not scratch ESL bodies with sharp objects.
- Use Nebular Ultra-WQ dedicated disassembly tools when disassembling.
- The mineral substances in rainwater, moisture or liquids might corrode the electronic circuit. Avoid water on the product as much as possible.
- Regularly clean the screen.
- Promptly remove cosmetics, perfume and other dirty on ESLs to avoid screen, case, or lens damaged.
- Avoid direct contact with chemical detergent.
- Avoid direct sunlight or incandescent light on ESLs.
- Do not install ESLs in a strong magnetic environment.
- Do not place ESLs near or in a fire.
- Do not place ESLs near kitchen appliances such as a stove, a microwave oven.
- ESLs communications might be limited or affected by other wireless communication systems that share the 2.4GHz frequency-band, such as Wi-Fi, Bluetooth, or Zigbee.

7 FCC ID warning

7.1 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.

7.2 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 the receiver.
- Connect the equipment to 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.

7.3 portable device statements

The device has been evaluated to meet general RF exposure requirements. The device can be used in portable exposure conditions without restriction.

8 IC statement

This device complies with CAN ICES-003 (B)/NMB-003(B).

This device complies with Industry Canada licence-exempt RSS standard(s). 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.

Cet appareil est conforme à la norme CAN ICES-003 (B)/NMB-003 (B).

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.

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux rayonnements de la IC établies pour un environnement non contrôlé. Cet équipement doit être installé et fonctionner à au moins 20cm de distance d'un radiateur ou de votre corps.

9 EU Regulations

Frequency Bands and Power:

SRD 2.4 GHz 2402MHz-2480MHz:10dBm

WEEE:

Special precautions must be taken to safely dispose of this product. This marking indicates that this product may not be discarded with other household waste in the EU.

To prevent harm to the environment or human health from inappropriate waste disposal, and to promote sustainable reuse of material resources, please recycle responsibly.

To safely recycle your device, please use return and collection systems or contact the retailer where the device was originally purchased.