



Hanshow Nebular Pro Series Product Manual

V1.0.2

HS-ESL-EPDN002

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ABOUT THE MANUAL

This document describes Nebular Pro series, including features, specification, package, and precautions.

Please read this manual carefully before using the device, 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; Netherlands: 0800-022-5037; Belgium: 0800-71-335; France: 0800-902-530; Thailand: 1800-011-185; Germany: 0800-182-7358; Australia: 0061-1800-953-008) 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 Pro 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.
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.

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1 Overview

The Nebular Pro series is Hanshow's newest generation Electronic Shelf Labels (ESLs). They adopt E-ink screen to achieve page switching, light flashing, pricing and so on based on 2.4GHz wireless communication. With ultra-thin, extended life and high-definition visual effects, the Nebular Pro series widely serves traditional retail, new retail, department stores and fashion, pharmacies, culture, and entertainment.

1.1 System architecture

Hanshow ESL system includes ESLs, ESL Controller, 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.

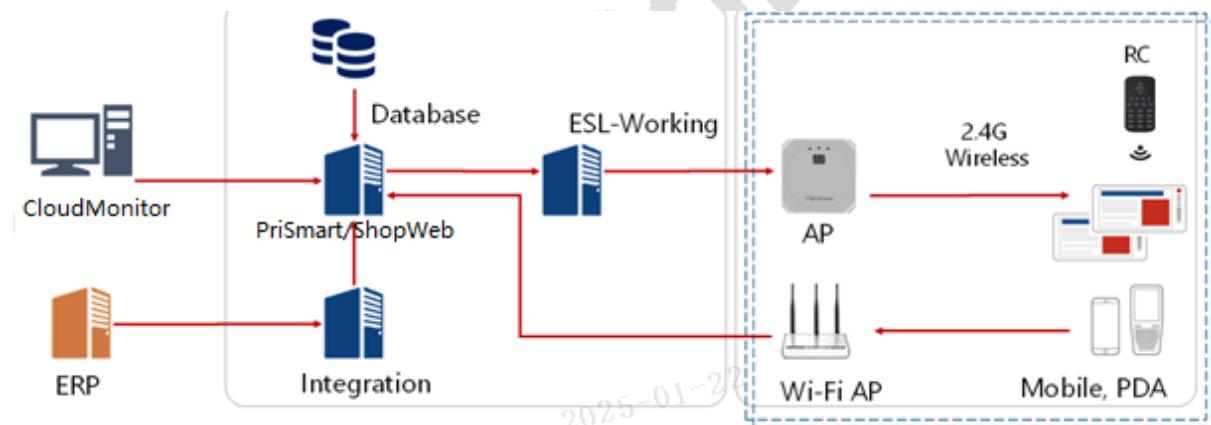


Figure 1-1 Hanshow ESL system architecture

1.2 Features

The features of Nebular Pro series are as follows:

- Nebular Pro ESLs come in 11 ESL sizes: 1.54", 2.0", 2.13", 2.66", 2.9", 3.46", 3.5", 4.2", 5.83", 7.5" and 9.7".
- Display colors include: Black, White, Red, Yellow, Orange and Grey, display (Only BW (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.
- The freezer ESLs come in two sizes: 2.13", 2.66" and 3.5" that function in temperature -25°C ~ 0°C.
- Nebular Pro 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 Pro series' appearance and composition.

2.1 Product appearance

Figure 2-1 shows Nebular Pro family.



Figure 2-1 Nebular Pro family

Each section of Nebular Pro and its relative description is shown in *Figure 2-2* and *Table 2-1*.

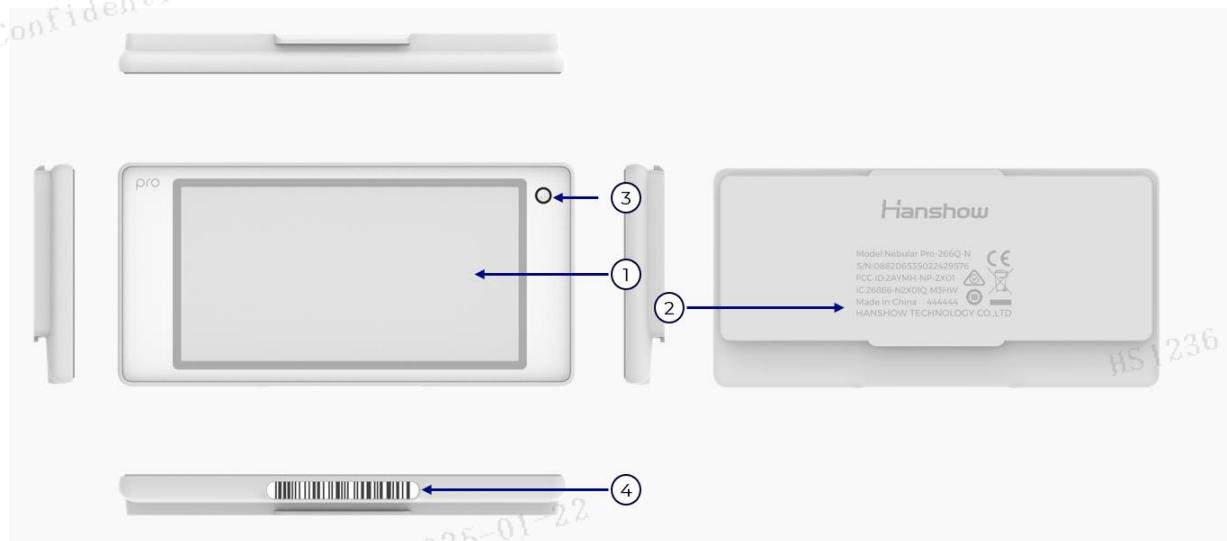


Figure 2-2 Key area of Nebular Pro

Table 2-1 Each area description of Nebular Pro

No.	Name	Description
1	LED indicator	Supports 7-color flashing.
2	Display area	<p>Supports BWR display on E-ink screen.</p> <ul style="list-style-type: none"> Display text, 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 Pro series.

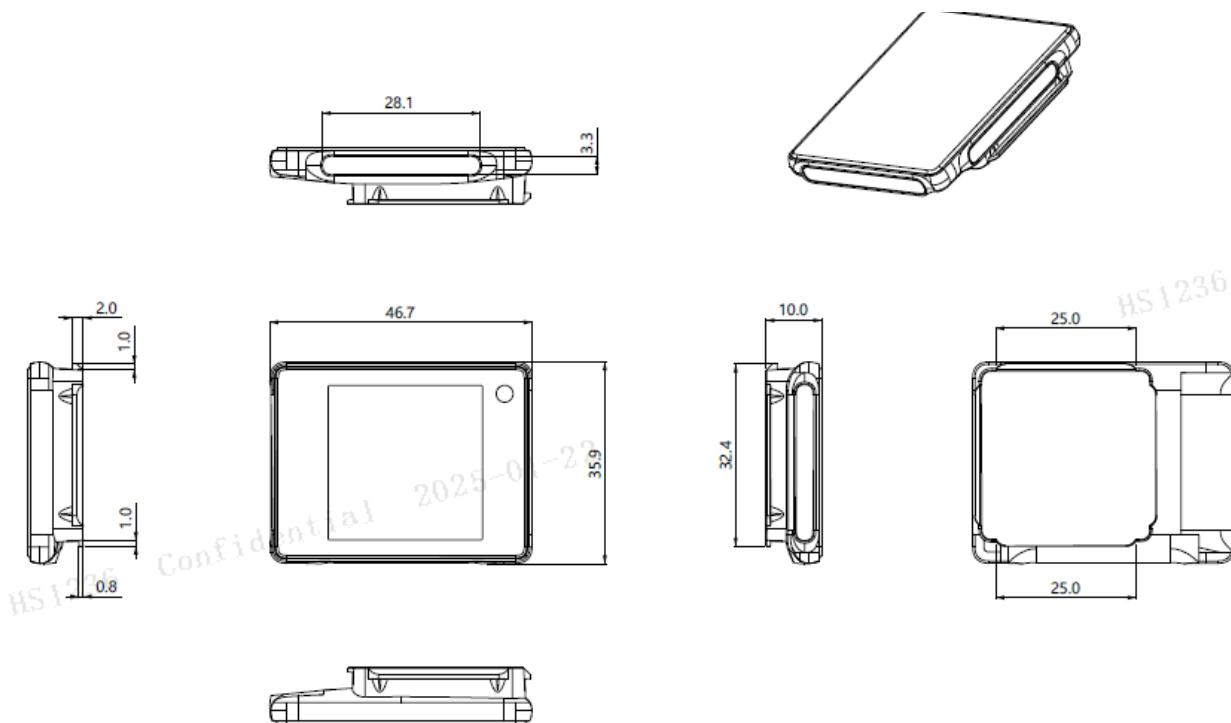


Figure 2-3 1.54" dimension

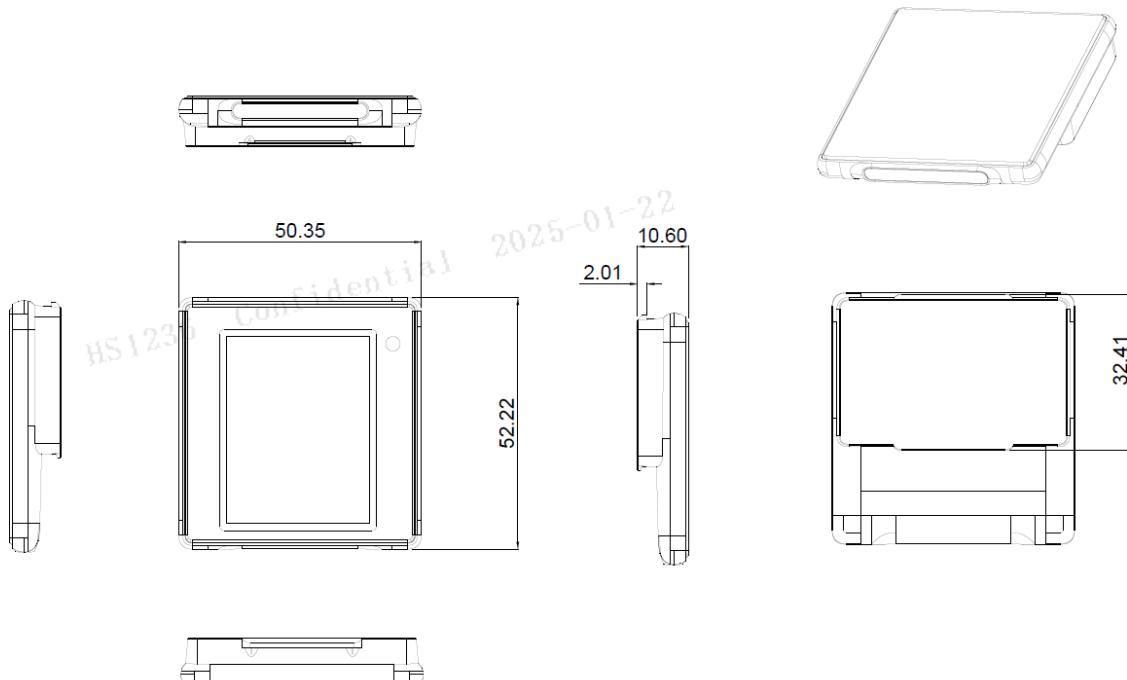


Figure 2-4 2.0" dimension

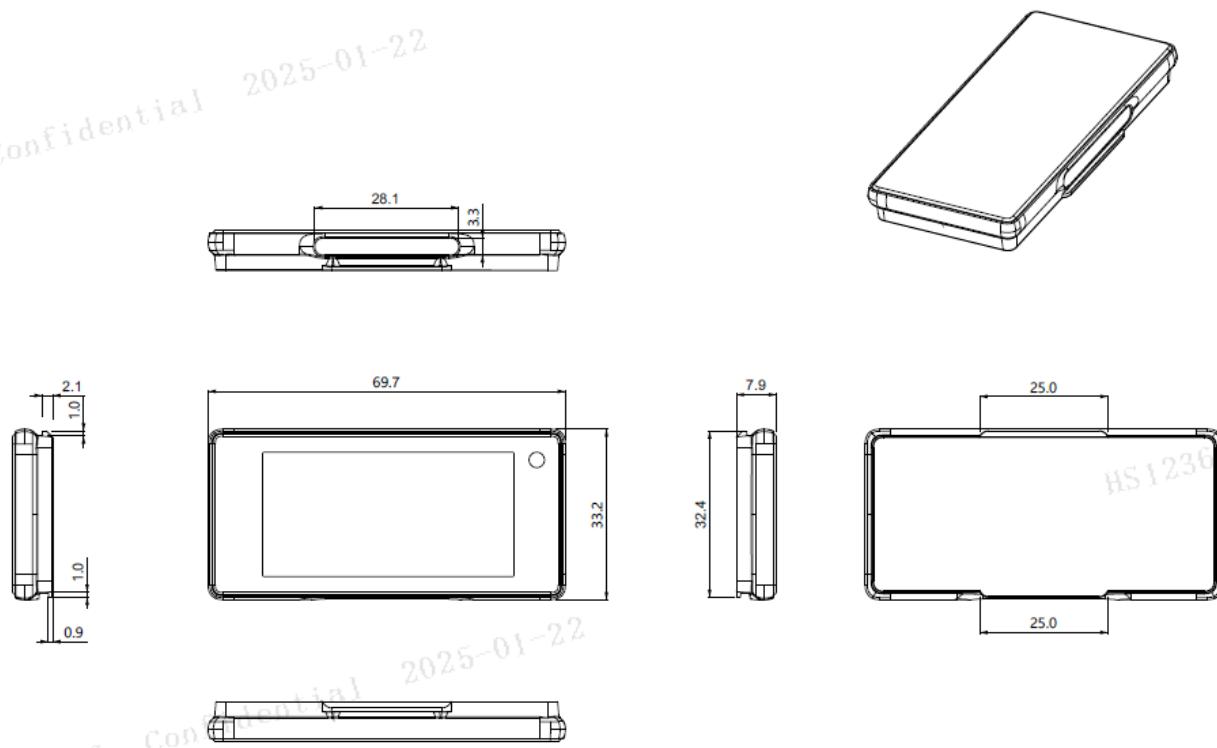


Figure 2-5 2.13" dimension

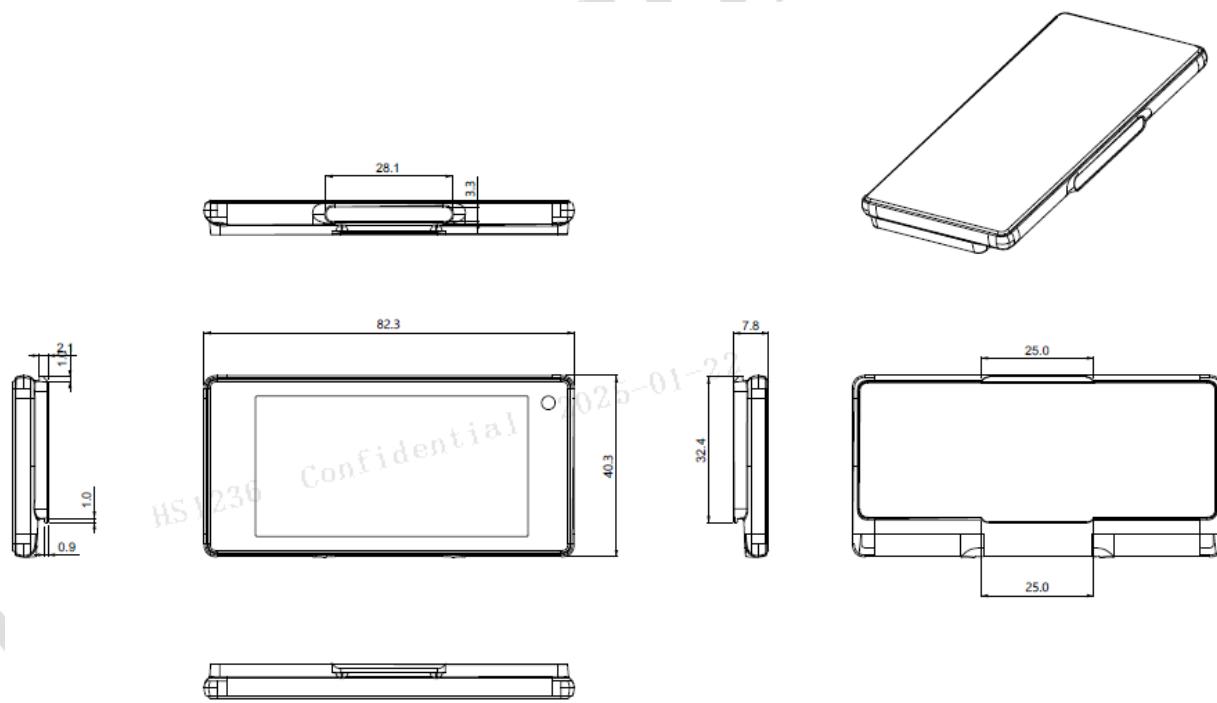
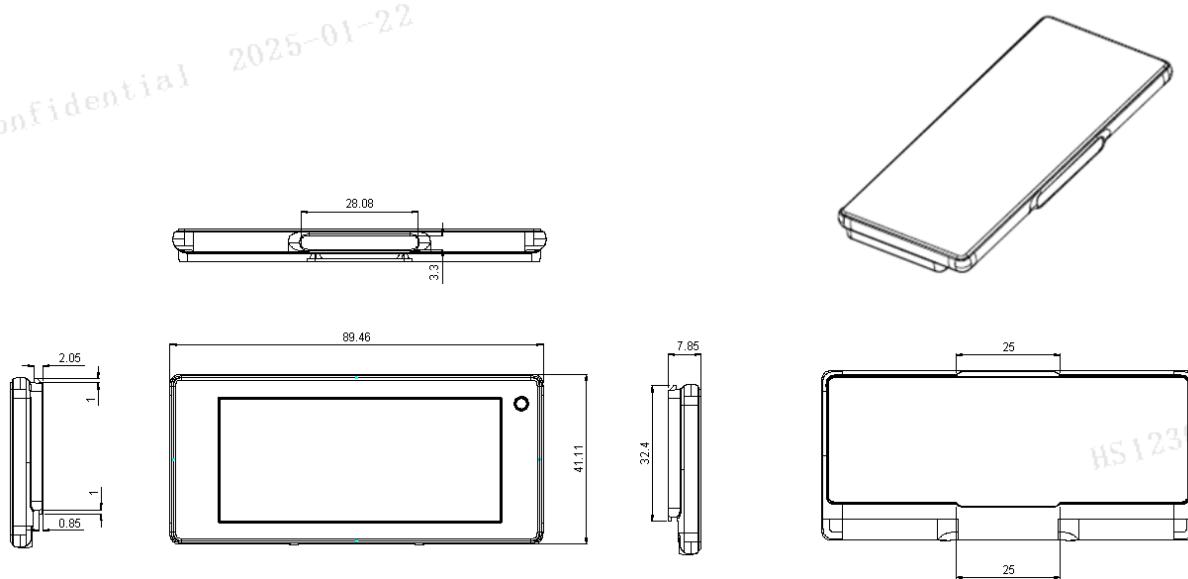
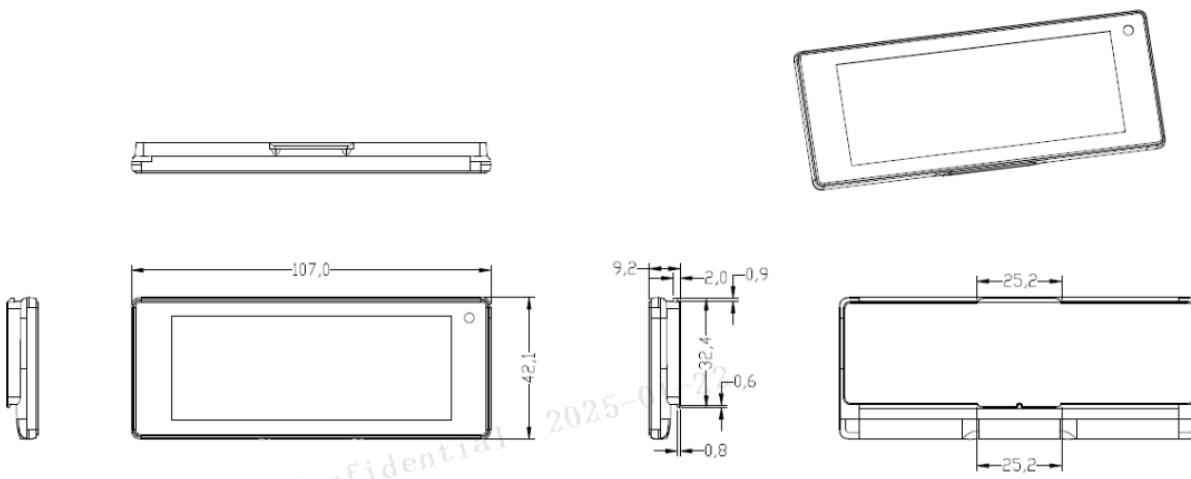


Figure 2-6 2.66" dimension

**Figure 2-7 2.9" dimension****Figure 2-8 3.46" dimension**

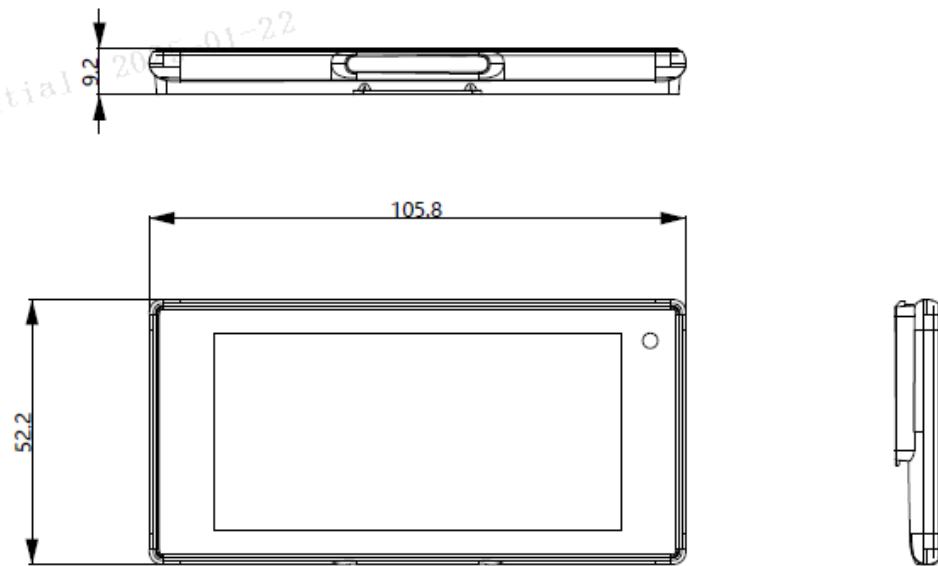


Figure 2-9 3.5" dimension

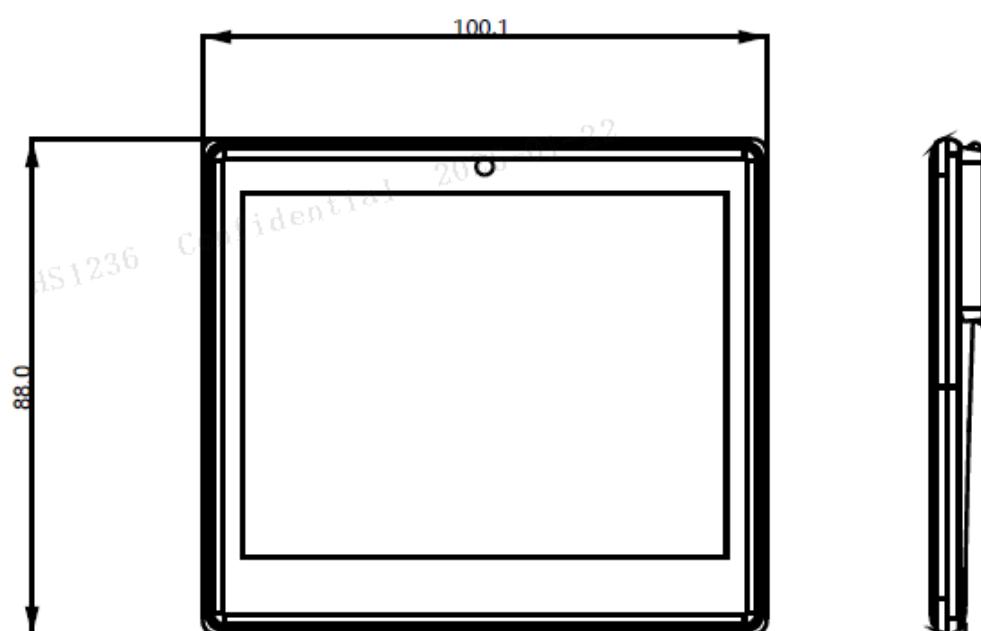
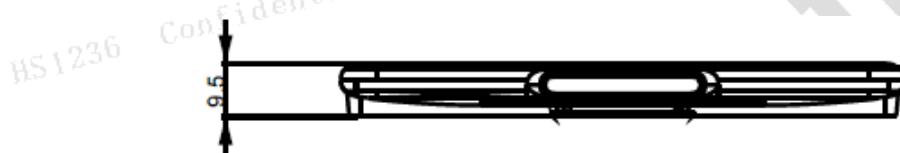


Figure 2-10 4.2" dimension

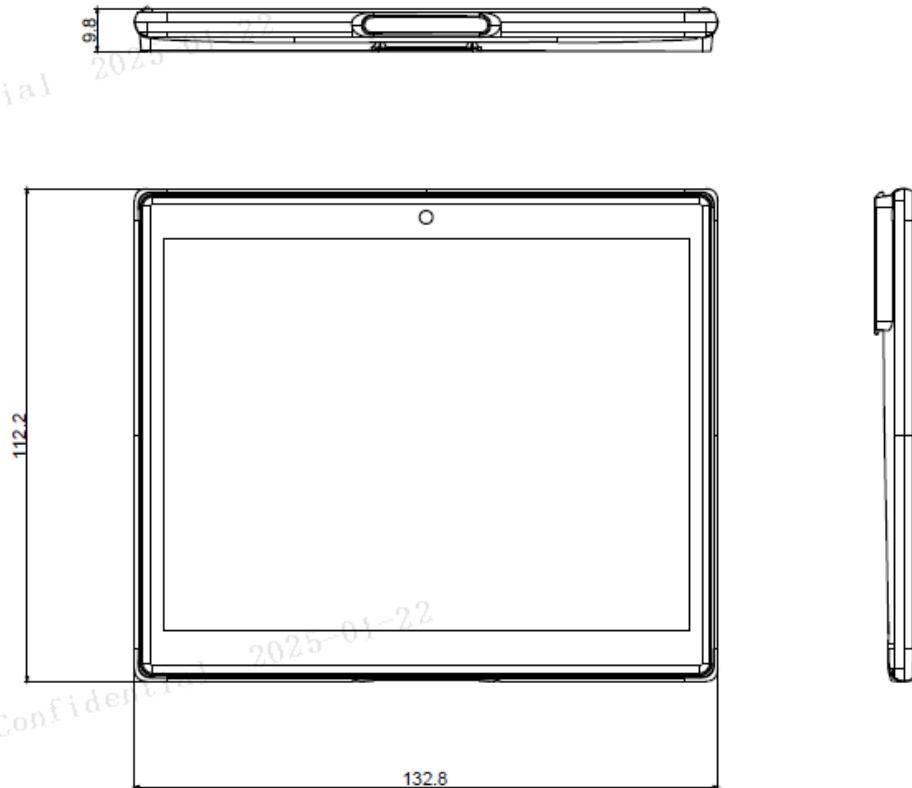


Figure 2-11 5.83" dimension

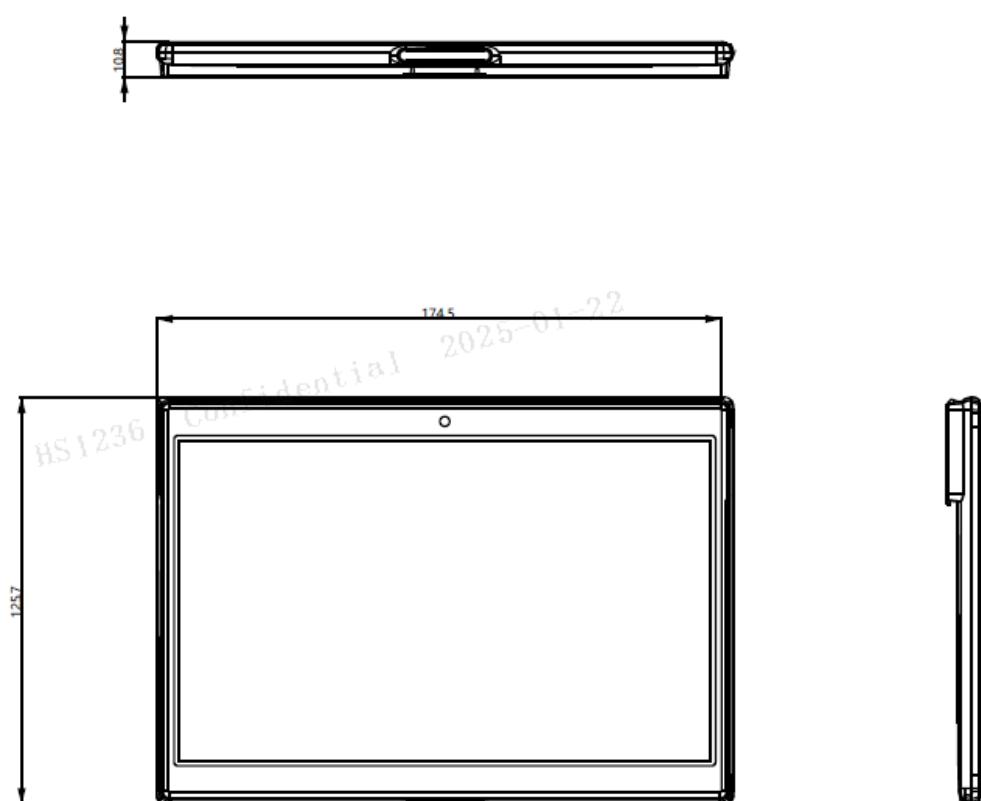


Figure 2-12 7.5" dimension

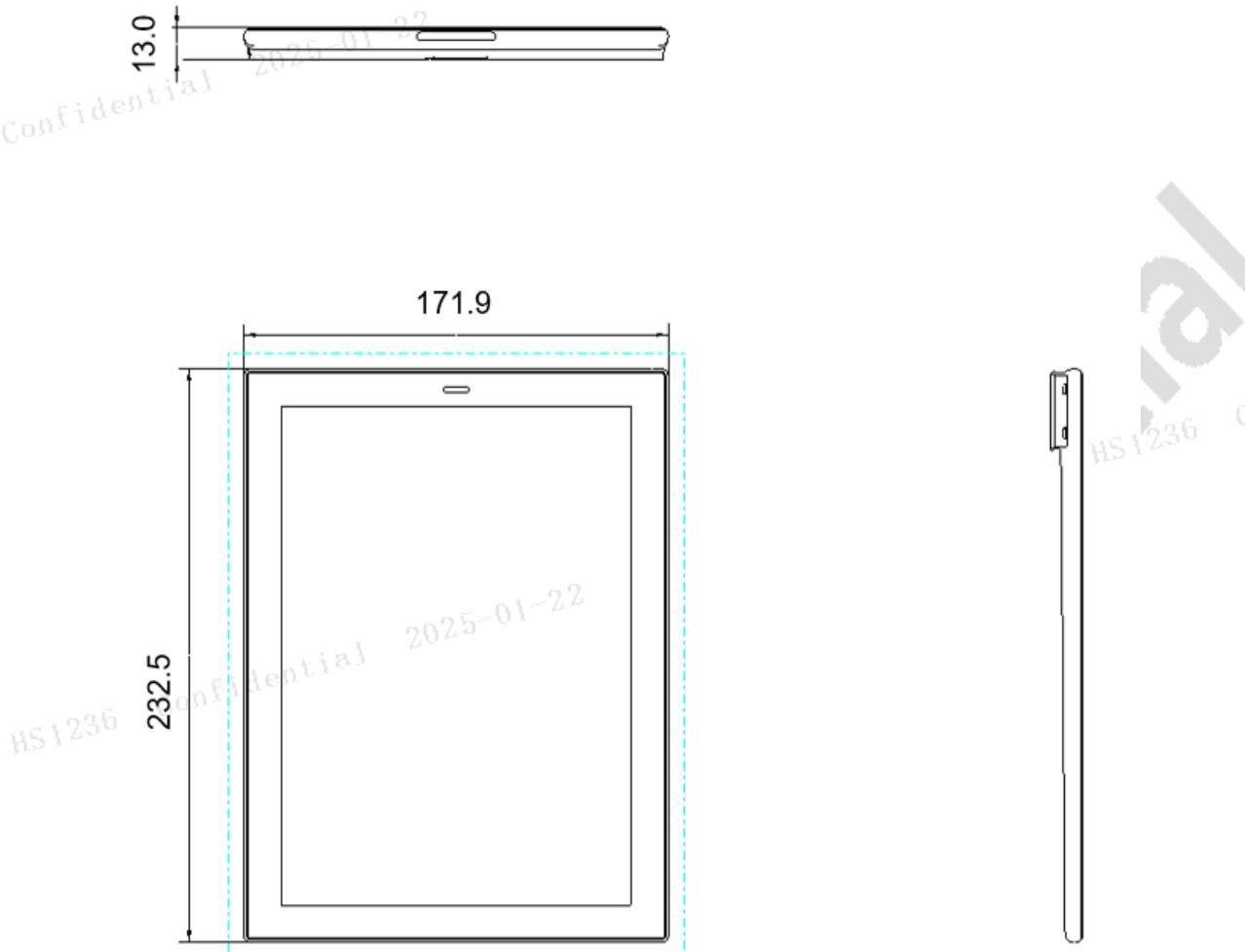


Figure 2-13 9.7" dimension

3 Hardware performance

3.1 Specifications

Table 3-1 lists the Nebular Pro specifications.

Table 3-1 Nebular Pro specifications

Name	1.54"	2.0"	2.13"	2.66"	2.9"	3.46"	3.5"	2.13" Freezer	2.66" Freezer	3.5" Freezer	4.2"	5.83"	7.5"	9.7												
Dimensions (mm*mm*mm)	46.7*35.8*10.0	50.35*52.22*10.6	69.7*33.2*7.8	82.3*40.3*7.8	89.5*41.1*7.8	107.0*42.2*9.2	105.8*52.2*9.2	69.7*33.2*7.8	82.3*40.3*7.8	105.8*52.2*9.2	100.1*88.0*9.5	132.8*112.2*9.8	178.1*125.7*10.8	171.9*232.5*13.0												
Active display area (mm*mm)	27.0*27.0	29.0*38.2	48.6*23.7	60.1*30.7	67.6*29.6	82.6*30.3	79.7*38.2	48.6*23.7	60.1*30.7	79.7*38.2	84.8*63.6	118.8*88.2	163.2*97.9	141.1*201.6												
Size (inch)	1.5	1.9	2.13	2.66	2.9	3.46	3.5	2.13	2.66	3.5	4.2	5.83	7.5	9.7 ^[3-4]												
Resolution (pixel) ^[3-1]	200*200	152*200	250*122	296*152	296*128	176*480	384*184	250*122	296*152	384*184	400*300	648*480	800*480	672*960												
DPI ^[3-1]	188	133	131	125	112	148	123	131	125	123	120	138	126	121												
Display color	Black, White, Red, Yellow, Orange, Grey (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			Up to 15 years			Up to 10 years															
Page switch	8 pages																									
Protection level	IP68																									
Operating temperature ^[3-3]	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40	-25 ~ 0	-25 ~ 0	-25 ~ 0	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40												
Storage temperature ^[3-3]	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40	-25 ~ 30	-25 ~ 30	-25 ~ 30	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40												
Humidity (%RH)	45 ~ 65																									

Note:

- [3-1]: The resolution and DPI might be subject to slight variations.
- [3-2]: Battery life is calculated based on the following scenarios: The battery life is up to 10 years if updated once a day for the following sizes: 1.54" /3.46"/3.5"/2.13" Freezer / 2.66" Freezer / 3.5" Freezer.
- [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.
- [3-4]: The battery of the 9.7" product is replaceable.

3.2 Product nameplate

Taking Nebular Pro 266Q-N as an example, *Figure 3-1* shows the nameplate of Nebular Pro.



Figure 3-1 Nameplate of Nebular Pro

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

4 Packaging and accessories

This chapter describes Nebular Pro series' packaging and required accessories.

4.1 Packaging

Nebular Pro family packaging and the specific ESL quantity is shown in [Figure 4-1](#).

Screen Size (inch)	Num. of ESL per Inner Box (pcs)	Num. of ESL per Out Box (pcs)	Inner Box Dimensions (mm)	Out Box Dimensions (mm)
154	30	300	354*57*46	383*247*131
200	30	360	372*60*60	389*378*155
213	35	280	333*80*44	367*193*177
266	35	280	333*93*51	367*389*119
290	35	280	333*100*51	367*221*217
346	20	140	228*117*51	370*255*145
350	20	120	228*116*61	378*245*150
420	35	140	352*108*96	367*207*245
583	20	100	380*160*145	835*420*190
750	/	10	/	270*216*165
970	25	50	321*182*248	385*340*274
213F	35	280	333*80*44	367*193*177
266F	35	280	333*93*51	367*389*119
350F	20	120	228*116*61	378*245*150

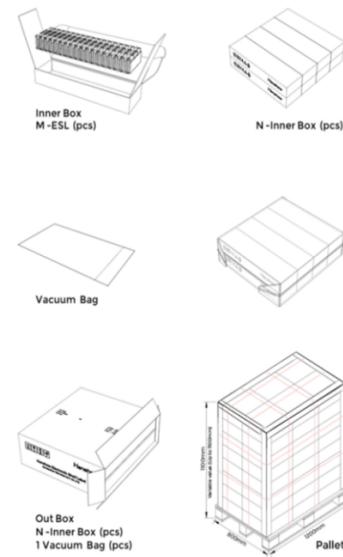


Figure 4-1 Nebular Pro family packaging

4.2 Product accessories

Common accessories of Nebular Pro series are shown in [Table 4-1](#).

Table 4-1 Common accessories of Nebular Pro series

Rail	
Table stand	
T-hook	
Basket clip	

5 Application scenarios

Nebular Pro series are available to various zones and shelves of hypermarkets, supermarket 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 Pro series, please note the following precautions.

6.1 Transportation considerations

Avoid the following considerations during transport:

- Water leakage or heavy moisture.
- Heavy stacking.
- High heat conditions above 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 Pro 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 Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

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