1 General Description

SOLUM NEWTON Electronic Shelf Labels (ESLs) are components to a total SOLUM's ESL System. The SOLUM's ESL System consists of the ESLs, Gateway(s), Server, and optional accessories (such as the Newton Remote Controller) and is used to electronically displays key information such as price and product information, that are traditionally printed or written on paper in environments like supermarkets, warehouses, and factories.

SOLUM's Newton ESLs are the industry leading solutions that provide the longest battery life (up to 13 years), fastest update speed, built in LEDs, built in buttons, IP67 rating for rough environments, multiple pages per ESL, and more to take the operation beyond just displaying information on the ESLs.

Newton ESLs come in various sizes and colors to meet all customer use cases. They are battery powered for ease of deployment and wirelessly receive updates from SOLUM Gateway for.

2 Specification

This section details specification of each ESL by size. ESLs are identified by the diagonal measurement of the display in inches. For example, a 2.9" ESL is referring to an ESL with the diagonal display dimension of 2.9".

2.1 Product Specification

Item	Description
Label Dimensions	**12.2":** 216.2 x 260.0 x 15.35 mm / 8.51 x 10.23 x 0.60 inch)
Display Dimensions	**12.2":** 190.1 x 237.6 mm / 7.48 x 9.35 inch
Display Resolution	**12.2":** 768 x 960 Pixel(102dpi)

Item	Description
Label Weight	**12.2"**: 586.00gr
Viewing Angle	Nearly 180°
Display Colors	●● BWRY (black, white, red, yellow) ** color options are not available for all sizes. See Section 3.XX for full list of options.
Battery	Type and quantity of batteries defer based on ESL CR2450 Lithium Battery - 6P: 12.2"
Wireless Communication	2.4 GHz Unlicensed ISM band SOLUM proprietary protocol FeliCa NFC Forum Type 3 (13.56MHz) NFC Passive Only
Communication Distance	147 feet (45m) radius Line of Sight
Security	128-bit AES Encryption
Compliance	FCC, IC, CE, TELEC, RoHS

Operating Temperature	**Nominal ESLs** **BWR:** 32F ~ 104F (0C ~ 40C) @45~70% RH **BWY:** 32F ~ 86F (0C ~ 30C) @45~70% RH **BWRY:** 32F ~ 104F (0C ~ 40C) @45~70% RH **Freezer ESLs** **BW:** -13F ~ 31F (-25C ~ 0C) *freezer ESL must be used in freezer enviroments
Storage Temperature	32F ~ 104F (0C ~ 40C) @45~70% RH

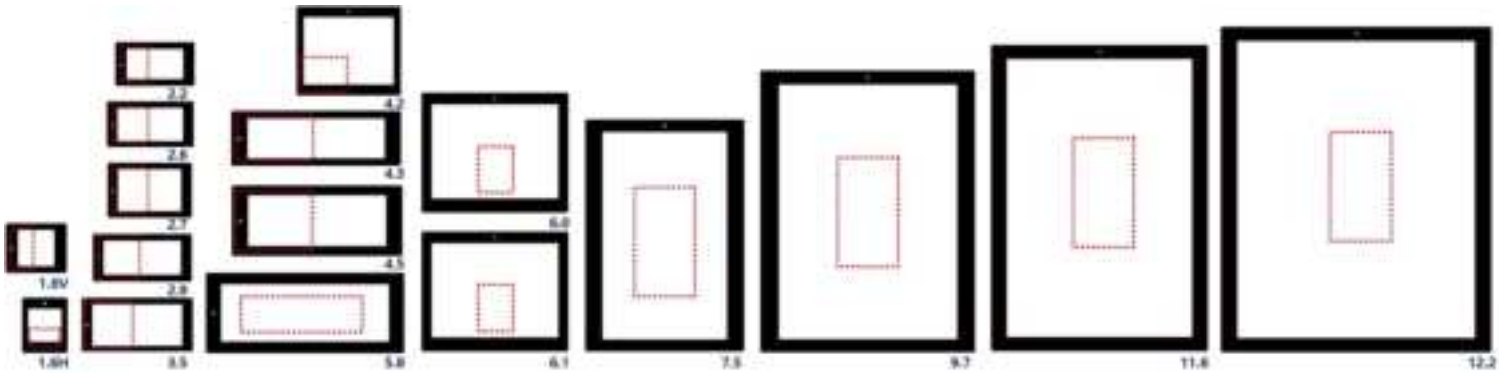
2.2 Radio (RF) Specification

Item	Parameter	Specification			Unit	Condition
		Min	Typ	Max		
Tx	Tx Power	-	4	-	dBm	
	[Carrier Frequency Offset and Drift]	-75	0	75	kHz	
	Tx Current		-	10	mA	total current at max Tx Power
Rx	Receiver Sensitivity	-85	-	-	dBm	PER < 5%

2.3 NFC Specification

Item	Parameter	Specification			Unit	Condition
		Min	Typ	Max		
NFC	Read Distance	-	0.7	-	in	
		-	20	-	mm	

NFC antenna location shown for each ESL size.



3 Product Handling Precautions

Provisions should be made to protect against any damage to the product caused by improper handling. The purchaser assumes any responsibility for damage to the product caused by improper handling.

Product should be stored in 32F ~ 104F (0C ~ 40C) @45~70% RH environment and should be installed within **90 days** of receipt.

3.1 Usage Environment

Take extra caution when using this RF device in the vicinity of other electronic devices and appliances. Most electronic devices and appliances use electromagnetic waves. Electromagnetic waves emitted by this RF device can affect other electronic devices and appliances.

If using the device in an explosion hazard area, follow all safety regulations, instructions, and signals.

3.2 Storage and Use

- Moisture and liquids can damage internal parts and circuit boards if allowed to enter into the device itself.
- Do not place or store the product on a sloped surface. The product may slide and fall off the surface and become damaged.
- Use the product in temperatures ranges of **0°C~40°C/32~104°F(BWR), 0°C~30°C/32~86°F (BWY), 0°C~40°C/32~104°F(BWRY) or -25°C~0°C/-13~32°F(Freezer)**. Parts and circuits may be damaged if operated or stored in extreme temperature.
- The display panel needs extra care during handling.
  - Do not apply any impacts on the e-Paper display as it is fragile.
  - Continuous exposure to excessive moisture (over 70% RH) or UV shortens display lifetime.
  - Ghosting image may appear in temperature conditions of less than **15°C/59°F for normal tags and -25°C/ -13°F for freezer tags**. (If ΔL* >2, we call it ghosting phenomenon)
- Avoid areas with strong magnetism or subject to magnetism.
  Contact between the device and a magnetic object can lead to malfunctions.
- Do not place the product near heat-producing kitchen appliances like a stove or a microwave or in the vicinity of highly pressurized containers.

- External impact to the product, such as from being dropped, can damage the product.
- Twisting and bending the product can damage the exterior casing and the internal components.
- If this product operates abnormally while removing battery or replacing battery, it needs to be discharged by contacting the battery terminals (+) and (-) in the product.
- This product uses the 2.4GHz frequency band for the wireless communication network. Radio communications can be limited or affected by other applications that share the same frequency band, such as WiFi, Bluetooth, Zigbee, etc.
- A prior investigation into the radio environment is strongly required for efficient and smooth installation.
- Frequent communications, updates and screen renewals may reduce battery life time.
- Low temperature environments may reduce battery life.
- FIFO (First In First Out)

3.3 Product Cleaning

For Spray Cleaning:

Steps

① Lightly spray all surfaces and wait a few seconds.
② Gently wipe clean using a cloth or tissue.
③ Let the labels dry.

Notes:

- Use mild, non-alcoholic detergents or glass cleaner.
- Recommend non-abrasive cloths: Microfiber, Cotton T-shirt, Cotton handkerchief, Cotton tea towel

For Wet Tissue Cleaning:

Steps

① Stand or lay down the labels.
② Wipe using wet tissues.
③ Let the labels dry.

3.4 Battery Replacement

Audience

- Authorized personnel with the following knowledge are allowed to replace the battery:
  Battery / Electronic assemblies (e.g. circuit board) / Compliance with the instruction

※ Note: Warranty is voided if battery is replaced by unauthorized personnel.
(When batteries require replacement, please contact the authorized personnel)

Instructions

- Risk of short circuit if battery is incorrectly installed/stored.
- Check that hands are dry before and at all times during the replacement process.
- Keep batteries away from children and infants.
- Do not heat, charge, bend, drop, short-circuit and/or disassemble battery.
- Do not mix together used and new batteries or different battery types.

※ Note: Battery rarely has minor stain or leak.

Battery **Directional**

Top: (+) Positive

Bottom: (-) Negative

Figure 15. Battery Directional

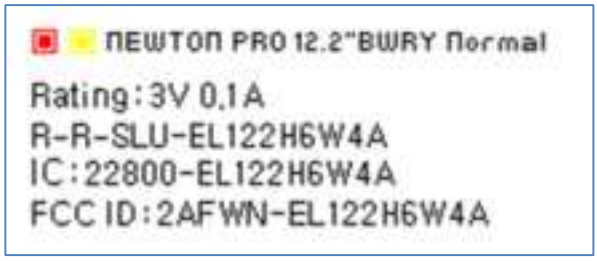
3.5 E-Label

[Accessed by the user]

−Step1 : There is a button on the right top side of the tag at the front view.

Press the button for 3 seconds and then ESL screen will be off.

−Step2 : Press the button for 3 seconds again and then E−Label will be shown during 1 minute on the display.



4 Battery Handling Guide

4.1 Avoiding hazards in lithium battery handling

1. Do not short circuit (Fig. 1)

. Direct connection of plus (+) and minus (-) poles may result in leakage, heat generation, explosion and/or fire.

. Do not store and/or carry batteries with metallic items, such as a necklace.

2. Do not stack and/or jumble batteries (Fig. 2)

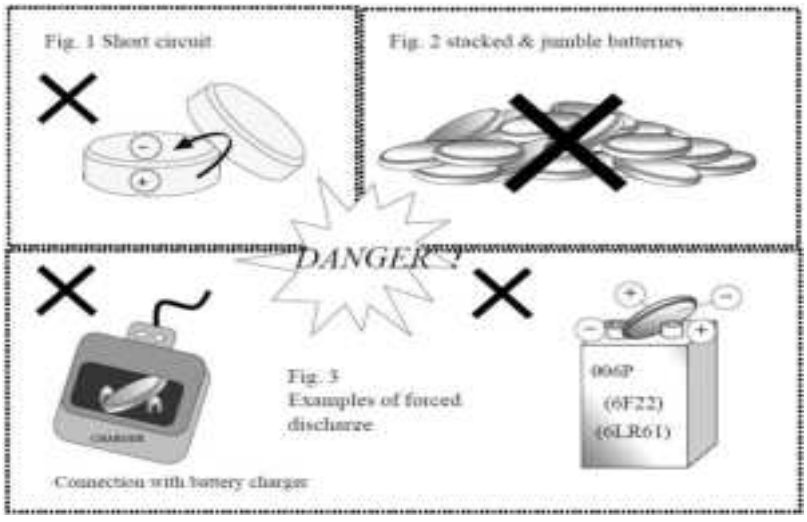
. Stacked and/or jumbled batteries may cause a short circuit and/or forced discharge from contact with other batteries.

. This may result in leakage, heat generation, explosion and/or fire.

3. Do not make forced discharge batteries (Fig. 3)

. On a forced discharge by an external power source,
the battery voltage goes to negative and
this causes gas generation in inside of the battery.

. This may result in leakage, heat generation,
explosion and/or fire.



4. Do not dispose of batteries in fire

. Disposal of batteries in fire is extremely dangerous with a risk of explosion and violent flaring.

5. Do not heat batteries

. Heating batteries above 100℃/212℉ may damage the resin in crimping, separator and other parts, potentially causing an electrolyte leak, internal short circuit, fire and/or explosion.

6. Do not solder directly onto batteries

. Direct soldering onto batteries may damage the resin in crimping, separator and other parts, potentially causing an electrolyte leak, internal short circuit, fire and/or explosion.

7. Do not recharge batteries

. Recharging of batteries may result in internal gas generation, causing electrolyte leak, battery swelling, fire and explosion.

8. Do not disassemble batteries

. Disassembly of batteries may generate gas that may irritate your throat.

. Lithium may also react with moisture to generate heat and fire.

9. Do not deform batteries

. Applying extreme pressure to batteries may cause deformation of the crimping and internal short circuit, causing electrolyte leak, battery swelling, fire and explosion.

10. Do not mix different type batteries

. For some applications, mixing different types of batteries or new and old batteries, can cause an overdischarge due to differences in voltage and discharge capacities.

. This may lead to the risk of swelling and/or explosion.

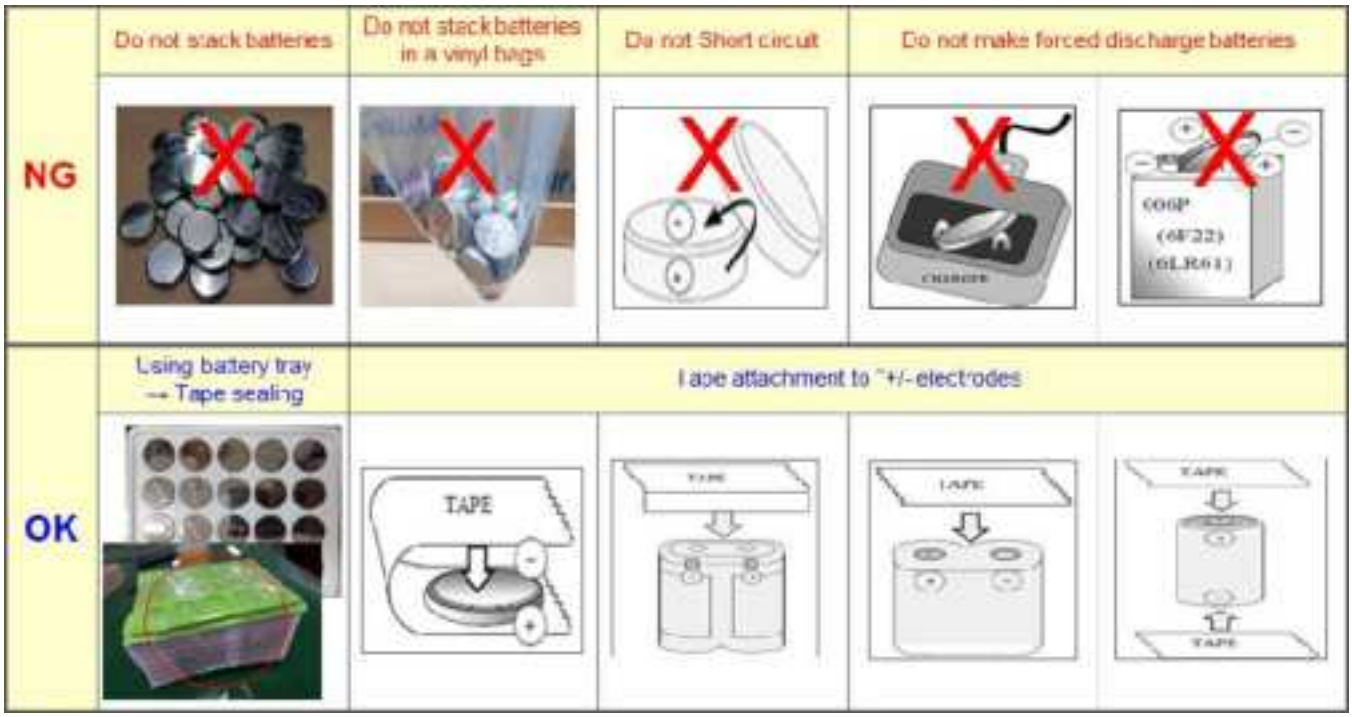
11. Do not insert batteries with opposite polarity

. For some applications, battery insertion with opposite polarity (reverse insertion of plus and minus) may result in leakage, heat generation, explosion and/or fire.

※ Please ensure the above precautions are strictly observed by related divisions including production, warehouse, product technology, sales, quality, customer stores, S/I companies, part-time workers, and external service companies.

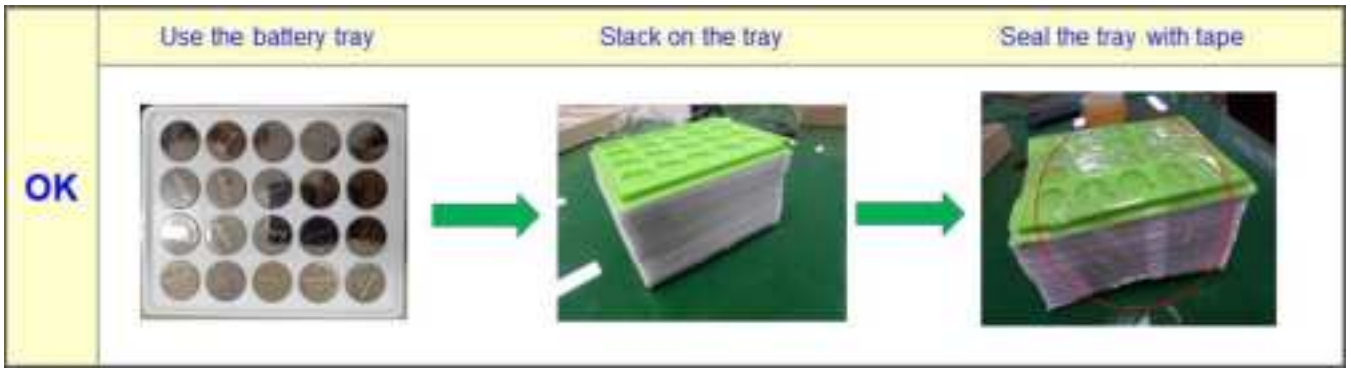
4.2 Proper Storing and Disposing of Lithium Batteries

■ To minimize risk of fire and explosion of batteries, be sure to follow the instructions below.



■ Proper use of battery tray is outlined below.

With batteries properly placed into each tray slot ➔ stack the trays in the same orientation ➔ use an empty tray on the top stack ➔ tape the stack together to avoid falling apart.



■ Follow local regulations for proper battery disposal guideline.

5

5.1.1 FCC

FCC ID : 2AFWN- EL122H6W4A

FCC Information to User

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution

THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE.

SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

IMPORTANT NOTE: FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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 of the device.

5.1.2 ISED

IC : 22800- EL122H6W4A

ISED Information to User

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, meme si le brouillage est susceptible d'en compromettre le fonctionnement. Attention: Tout changement ou modi_cation non expressément approuvé par le fabricant peut annuler le droit de l'utilisateur à utiliser l'équipement. exposition aux rayonnements radiofréquences. Pour se conformer aux exigences de conformité de l'exposition IC RF, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil et toutes les personnes

-PMN(Product Marking Name) ESL Label

-FVIN(Firmware Version Identity Number) V29

5.1.3 CE

We hereby declare under our sole responsibility that the electrical product above is in compliance with the essential requirements of the Radio Equipment Directive (2014/53/EU) by application of

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013

EN 62479:2010

EN 301 489-1 V2.2.0

EN 301 489-17 V3.2.0

EN 300 328 V2.2.2

and the Directive (2011/65/EU) on the restriction of the use of certain hazardous substances in electrical and electronic equipment by application of EN 62321 Series. **REV 1.1 SOLUM** Traceability

• SOLUM CO., LTD

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