

# PRODUCT CATALOG

Electronic Shelf Labels

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**SOLUM**  
Solution provider.

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Digitizing the Retail and Industrial Market with Industry-Leading ESL Solutions since 2011.

**70+**

Million ESLs



in

**6000+**

Stores across **35+** countries

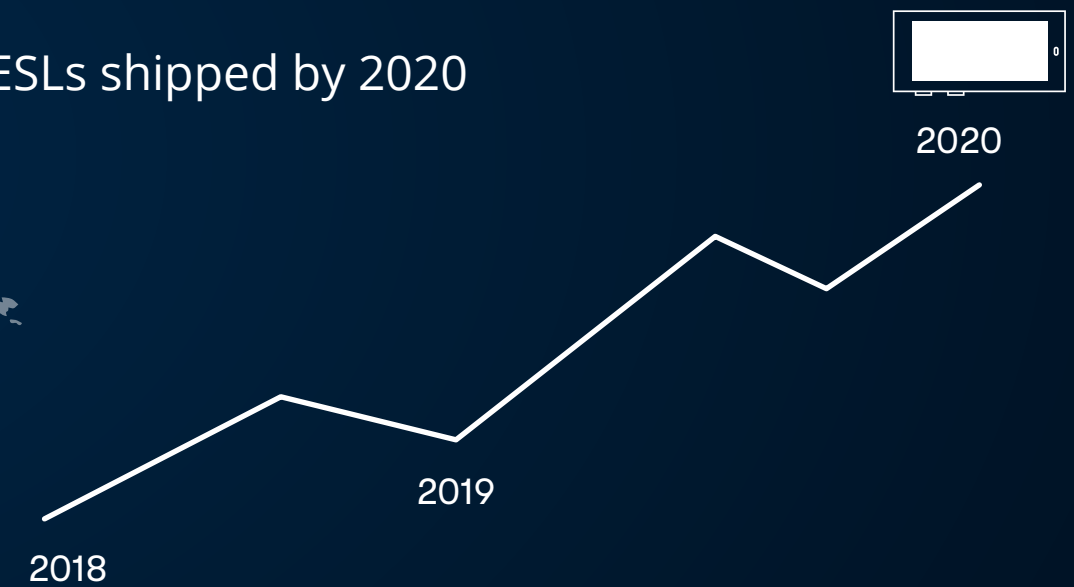


**100**



**million**

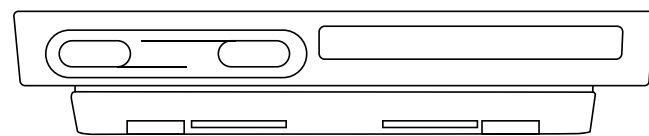
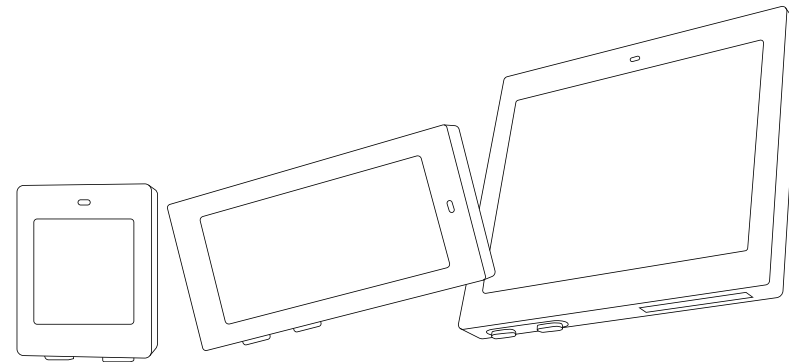
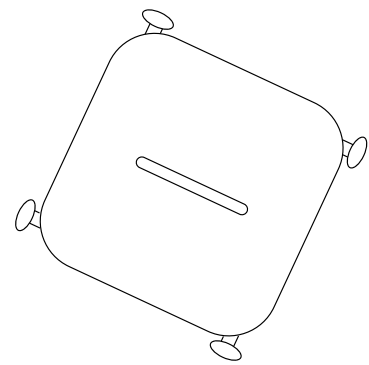
target ESLs shipped by 2020



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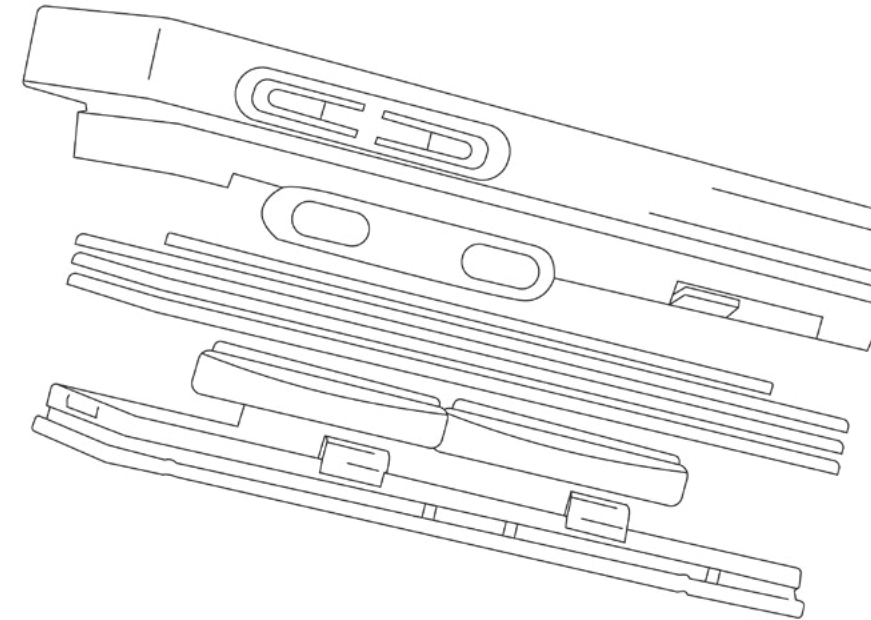
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## MESSAGE FROM THE CEO

TEN YEARS AGO, we penetrated the market with a product that was deemed avant-garde and ahead of its time: an electronic shelf label featuring an E-paper display. SOLUM has grown rapidly since then producing labels for global retail giants such as LOBLAWS, THE BEER STORE, MACY'S, ROGERS AND FIDO and more.

In fact, we've supplied more than 70 million ESLs in over 35 countries and over 6,000 stores worldwide.

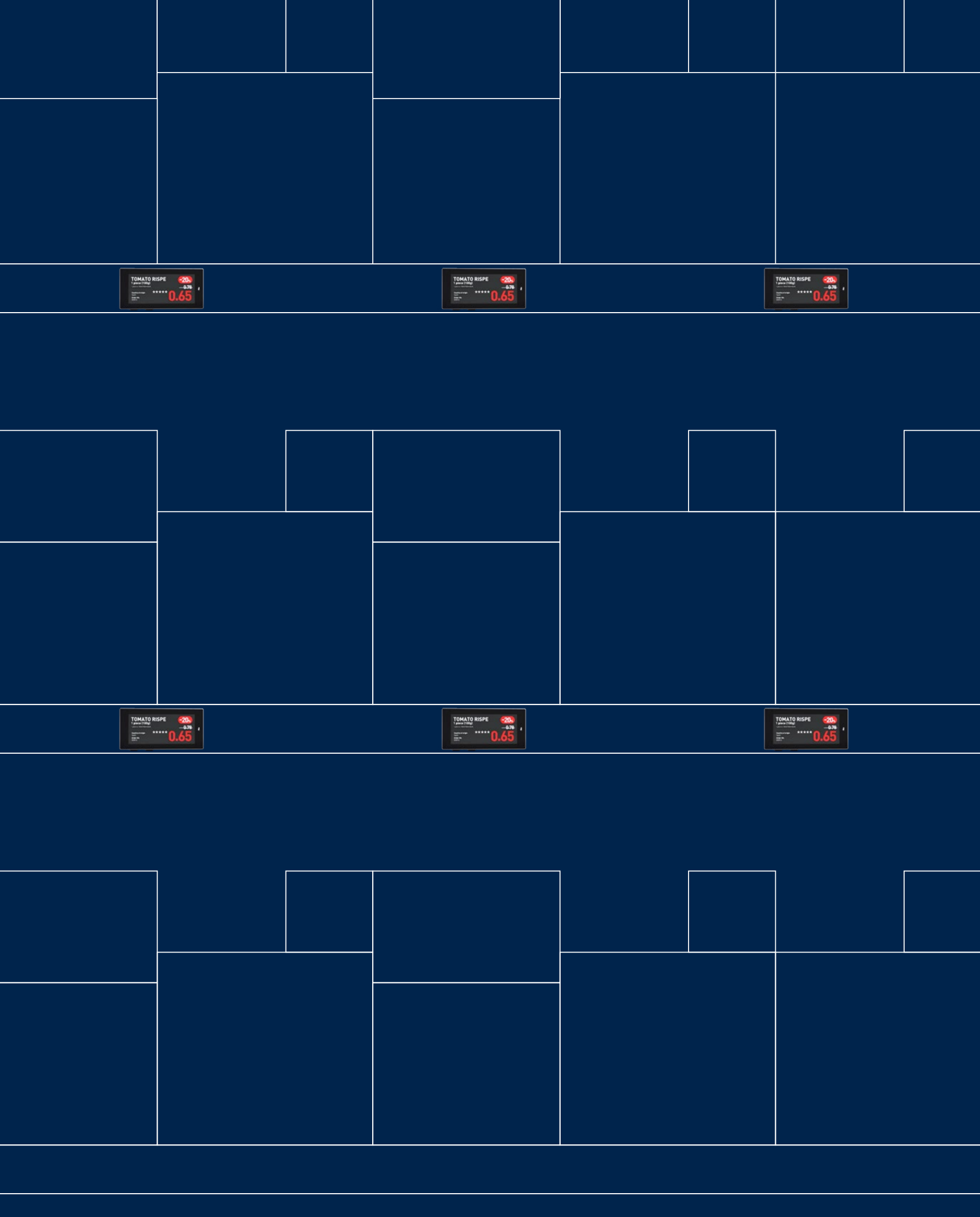
Despite the relative success with our initial rollout, we are far from satisfied. We are fully aware that growth, whether digital or otherwise, is always continuous. To be successful with technological endeavors, a business should aim to never be stagnant.

And where does the initiative to grow and keep growing begin? At the top. I believe that digital transformation rests on the shoulders of C-level leaders. Business managers and owners need to do their due diligence; whether that's researching on their own volition or hearing the advice of more knowledgeable members of their board. CEOs in particular must never fall asleep at the wheel, and be the driving force so the rest of the company may be mobilized to reassess their approach to technology and growth.

This product catalog showcases what our company has to offer for all our clients across the retail and industrial sectors. We don't just think that our daily lives are now more technologically-driven... we know so. Which is why we champion the newer, the faster, the better. We've upgraded the ESL with features that will drive customers to physical retail stores and ultimately improve your businesses' ROI. On that note, may your future business endeavors be triumphant... and digital!

**J.H. Yoo**  
President, SOLUM America





## INTRODUCTION

As a spin-off company of Samsung, SOLUM has 45 years of experience with wireless communication technologies and devices. SOLUM's technical excellence, combined with proven product quality enables us to lead the world in ESL technology innovation. SOLUM has launched numerous innovations in the ESL industry and was the first company to offer e-paper based ESLs in 2010. We were also the first company to deploy the Central Server System to help companies reduce infrastructure costs.

Moreover, we are the only ESL supplier with its own manufacturing facilities – allowing us to shorten development time, maintain high standard quality control, optimize the supply chain system, and most of all, maximize cost competitiveness.

SOLUM is founded on a broad technological basis and immense industry know-how. We invest deeply in innovation, design & product development, to achieve the highest standard of quality. This enables SOLUM to develop and sustain long-lasting customer relationships.

For the last ten years, SOLUM has constantly been developing new products and solutions. This year, we are proud to present another innovative ESL solution designed and optimized to enhance further the efficiency, connectivity, and overall profitability of the retail and industrial business operations.

Introducing: Newton.

Multiple sizes. Limitless possibilities.





**Attach** Newton on your shelves.

**Detach** from the limited world of paper labels.





We set the bar for providing high-tech,  
well-designed digital solutions.



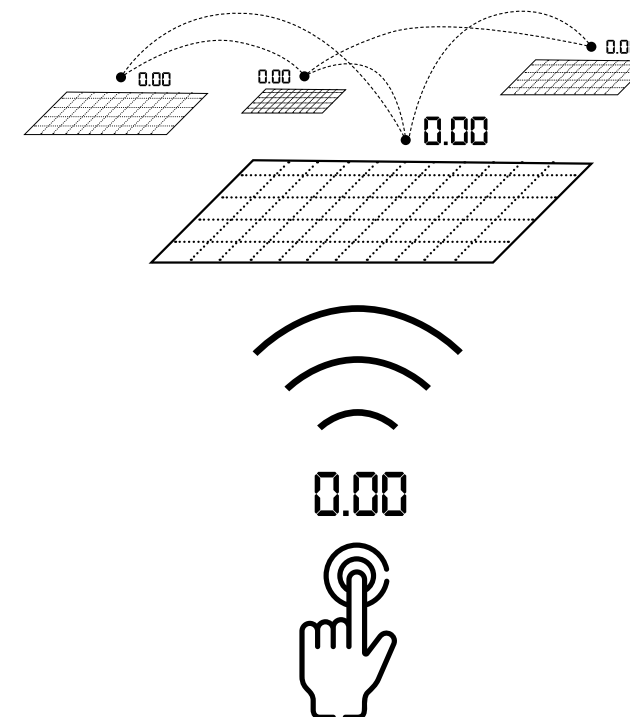
Battery lasts up to 10 years

Up to 10x faster



Multifunctional buttons





## HOW DO SOLUM'S ELECTRONIC SHELF LABELS WORK?

It's a wired, wired world, and the long arms of the Internet reach into almost every aspect of our waking life: from the way we communicate, to our data storage, and even to commerce practices.

It's only smart for businesses to leverage society's addiction to the worldwide web to increase their growth at an exponential rate. More and more companies are feeling the pressure to bridge e-commerce processes and physical shopping into one modern, streamlined retail model.

It's a need that is invariably recognized by the retail industry. - the Electronic Shelf Labels (ESLs)



A recent innovation that's taking over the retail universe, one store at a time, is something called ESL, or electronic shelf labels.

Its name basically describes itself: they are systems used in the retail industry for selling products in brick-and-mortar stores. They typically refer to the digital screens that are attached to the outer edge of display shelves that show the pricing and other relevant information of a product.

The business world is slowly recognizing the need for automated price management. According to research analysts, ESL is predicted to grow to be worth \$1,425 million by the year 2023.

### How do Electronic Shelf Labels work?

The display modules use electronic paper or liquid crystal paper to display information on a screen.

A local network makes it easy to change the price displayed whenever a product is updated. Since communication between the central servers and the tags are powered by wireless technology, the different components rely on reasonable range, speed, and battery life to be able to function properly.

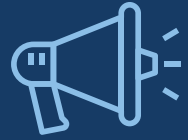
With just a few clicks from a remote server, thousands of displays across several channels can automatically be changed simultaneously without needing to print out paper labels and deploy store staff to manually replace the price tags on every shelf.

This is one of the strongest features that makes ESLs a great solution for businesses that offer shopping in physical locations. Not only are price and promo strategies easily manipulated with speed and accuracy, you can also do so with consistency—which is especially helpful when a store has several branches in varying locations.



# WHY SHOULD MY BUSINESS USE ESLs?

Sure, this emerging technology is exciting and interesting... but what does it do for your business, exactly?



## 1. Targeted advertising

Among other things, one great feature offered by ESLs is better and more effective advertising campaigns. Connect with smart consumers and send precise, targeted promotions to your patrons based on past purchases, search engine histories, and social media activities.

The technology also allows showrooming consumers to show competitors' prices and user reviews, which can be really effective in convincing customers to patronize your stores.



## 3. Additional revenue from brand partnerships

Some ESL modules have colorful and fully digital displays, and therefore can feature promos and rewarding in-store offers. This can open up so many possibilities, such as partnerships with brands to endorse their products on your labels.



## 2. Digital records

ESLs allow businesses to get ahead of their competition and respond to big data at a much faster speed. Taking the responsibility of manually replacing paper labels away from store associates will not only reduce costs but free up your employees' plates, giving them more time to focus on sales and other important tasks.

Simply update any shelf-edge, anywhere, in mere seconds. And you know what's the best thing about having a digital system in place for managing pricing? It's that you will automatically have audit trails that can be viewed, stored, and manipulated on a digital platforms.



## 4. Easier management of inventory

Other important internal processes may be sped up, too. Since inventory information is now digital, associates will be better able to locate where stock needs to go, improving replenishment and returns. This inventory information can also be connected to your online store, so order fulfillment done through your store's website can be easily managed.



## THE FUTURE OF RETAIL

The rise of progressive e-commerce websites has been posing a threat to traditional retailers, which is what moved these brick and mortar stores to explore alternative strategies that will allow them to rise to the challenge of their competitors. Although brick-and-mortar stores will still be the heart and soul of shopping, several steps and components of the typical consumer experience can be improved by digital platforms.

With the help of technology and big data, physical stores can be transformed into dynamic spaces that can provide personalized, exciting, and modern customer experiences.

**Reports postulate that the industry's skyrocketing growth is driven by several factors:**

1. The ever-growing popularity of retail automation
2. Issues arising with regards to government regulations on commodity pricing
3. Rising labor cost
4. Optimized operational efficiency
5. Real-time product positioning



# I. Newton Label

Shelf labels of today are more than just price displays.

For many, the shelf edge is prime real estate: being at consumer eye level, there is so much potential in this area even though it only measures several square inches.

Newton has redefined what it is that shelves can do for store owners, and for warehouse managers, and especially for customers.

Limitless possibilities. That's the Newton promise.

# Newton

New electronic shelf label.

## KEY FEATURES

### 10 YEARS BATTERY LIFE

For the last 20 years, the general expected lifetime of the ESL has been 5 years. But with Newton, changing batteries every five years is now a thing of the past. We have managed to increase Newton's battery life to an unparalleled ten years.

The expected battery life of Newton is 10 years in 10°~40°, 5 years in 0°~10° and 3 years in -0°~-25°.



#### Advantages:

- a) Lower lifetime cost
- b) Lower labor cost



### X10 FAST UPDATE SPEED

Three thousand tags can be updated within 5 minutes with a single Newton Gateway, which means it takes 0.1 seconds to update one tag. That makes Newton 10 times faster compared to other ESLs.

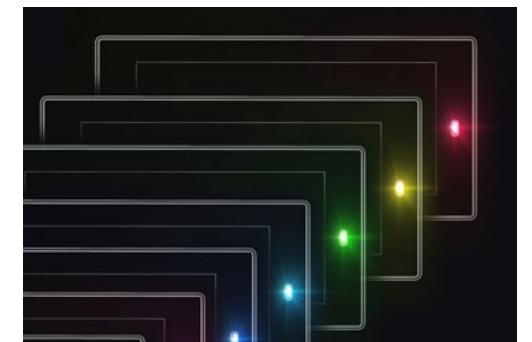
#### Advantages:

- a) Assignment process time between a label and product is 6~10 seconds
- b) Labor efficiency, increased store productivity

### 7 COLORS LED

The innovation of Newton in the battery life allows more possibility of heavy usage of LEDs. In other LED tags, the LEDs can only be lit on when it's requested to because of the high battery consumption.

Only 240 times of one LED light per a day (about 10 times of 10-seconds-set of LED blink-ing) is allowed to maintain the 5 years of battery life. But now this new generation tag allows the continuous LED blinking for a promotional purpose. With 3 sec of interval and 8 hours of operation in a day (8,228 times of LED light per a day) and for 100 days for a year, the battery life can still go up to 5 years.



### 2 PROGRAMMABLE BUTTONS

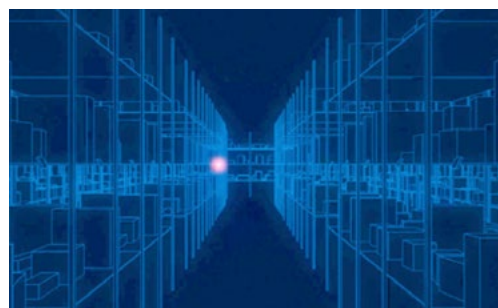
Newton comes with two programmable buttons which allows for more efficient tasks execution in retail and industrial environments. These two buttons can be associated with simple or complex actions - from initiating help from customer service to completing an order picking process.

With these buttons, customers can interact with the store more seamlessly, and staff can make their daily tasks easier and more efficient, leading to enhanced productivity.



## LOCATION BASED SERVICE (LBS)

Thanks to radio-frequency identification (RFID) technology, Newton is able to support Location Based Service. This feature allows automated product location and product navigation by detecting signal strength between the Gateways and ESLs.



## PROTECTION WINDOW

Labels can break for many reasons: they can be dropped, stepped on, or hit by shopping carts. The new screen protection cover increases the durability of the label screen up to 80% (323 kg m/s<sup>2</sup>) making it safer from potential hazards.



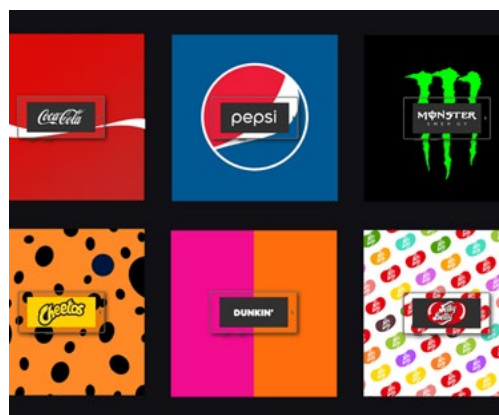
## REFINED AESTHETIC DESIGN

When it comes to design, we've completely redefined the capabilities of an ESL. SOLUM Newton comes with a whole new look—sleek and straightforward—giving a premium and modern look to wherever you choose to put it.



## CUSTOMIZABLE DESIGN

The real beauty of Newton is the fact that it is customizable. With Newton, you can incorporate your company's colors, patterns, and company logo. Now, that's what we call branding.



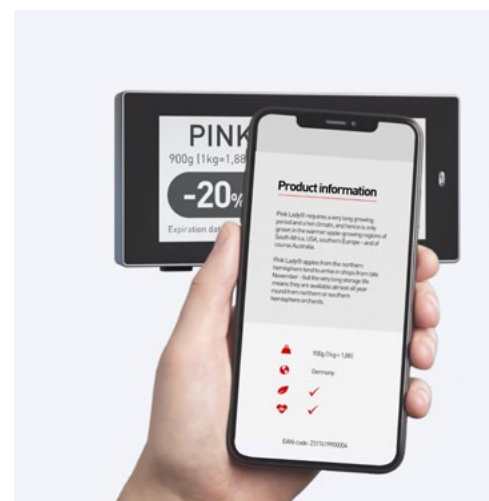
## UP TO 7 PAGE

All products are not created equal: there are some that are accompanied with more information than others. From nutritional facts to expiration dates to allergy warnings, all of this information can be uploaded into Newton's 7 pages. Using the multifunctional buttons, customers can flip through the different pages to access more data about the product.



## NFC

Newton's built-in NFC capabilities allow you to perform mobile payments (self-checkout), link to your company's online website, and download a digital coupon.



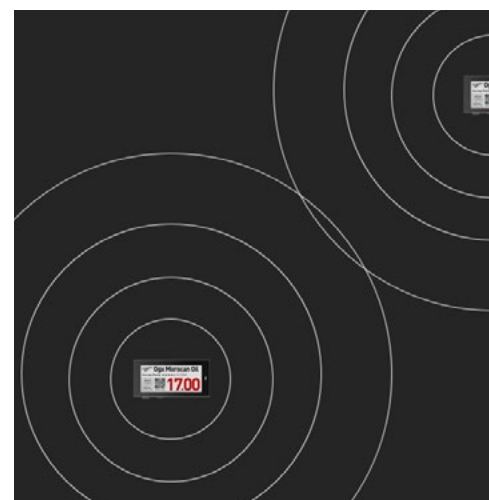
## MORE THAN 60 RF CHANNELS

Newton allows more than 60 RF channels (meanwhile, competitors offer only 11~16 available channels) which means it's a lot easier to select the communication channels in case of a very crowded WIFI circumstance.



## AUTO CHANNEL SELECTION

Even though we've found a means to prevent unexpected WIFI collisions thanks to our more than 60 RFI channels, the Auto Channel Section function of Newton gives you the opportunity to move to a free channel to avoid any RF interference. This means your store associates need not worry about any wireless communication issues, as the ESL system is always interference-free.



## IP67

Newton is fully water- and dustproof. You can put it anywhere, wet or dry. It can withstand the different temperatures in the fish, meat, or garden sections and last up to 30 minutes in water. Even the tiniest dust particles won't be able to penetrate it.





## SECONDARY FEATURES



### COMPLETE SEALING SYSTEM

The screen is also completely sealed to prevent the display colors from fading or drying out, meaning your display can retain that crisp color for longer.



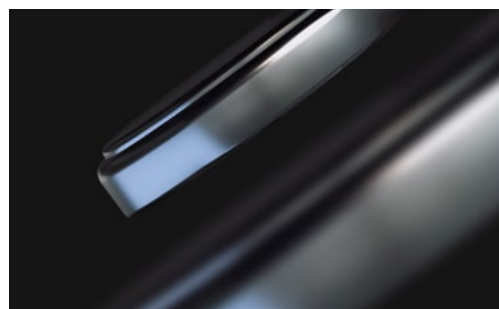
### HIGH RESOLUTION

Newton's screen resolution got upgraded by 20%: now, the crisp and clear display comes with 184dpi for our 1.6" display, and 145dpi for our 2.9".



### EASY LOCKING SYSTEM

Installation and removal have never been easier with Newton's easy locking system. You won't need any other tools for installation. Just use the Newton remover to detach a tag from the shelves.



### EASY BATTERY REPLACEMENT

Each Newton unit comes with its own battery, which can be replaced manually. Instead of sending a whole tag to the RMA (Returns Management Authorization) center, SOLUM can simply deliver a replacement battery pack. This reduces the processing time and cost. The LED tags on each ESL unit are also programmed to blink constantly as an indication that a tag is running low on battery.

# Newton GATEWAY



Newton Gateway digital numbering system gives it a modern and digitized look. But more importantly, this makes it easier for managers to identify the Gateway's ID for internal device management purposes.

Another improvement with Newton Gateway is that it has a tag and load-balancing system which means that the number of connected labels will always be evenly distributed. No overloading or underloading between Gateways and no need to manually track the Gateways' load.

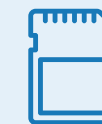
It has more than 60 RF channels which means that there's almost no interference issue. And its auto-channel selection system allows it to avoid channel collisions.



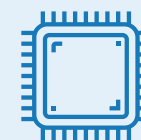
**50,000 labels**  
CAPACITY



**Ranges up to 30 meters or 98 feet**  
COMMUNICATION RADIUS



**4GB**  
FLASH MEMORY



**1GB**  
RAM



**10W**  
POWER CONSUMPTION



**Ethernet**  
INTERFACE

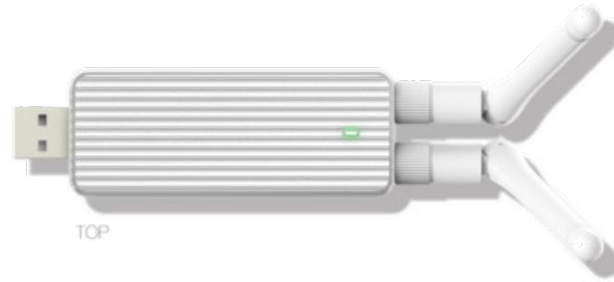
# Newton USB GATEWAY

The USB Gateway is a stand-alone system. However, it can also be an extension to the Newton Gateway. It can offer additional capacity, memory, range, among others, without the added infrastructure.

With Newton's Gateways, you can achieve a more seamless and automated data exchange between your electronic shelf labels and your command system.



FRONT



TOP



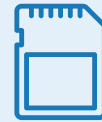
SIDE



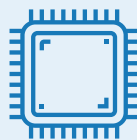
**50,000 labels**  
CAPACITY



**Ranges up to  
25 meters or 82 feet**  
COMMUNICATION RADIUS



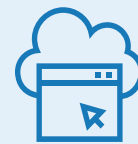
**4GB**  
FLASH MEMORY



**512 MB**  
RAM



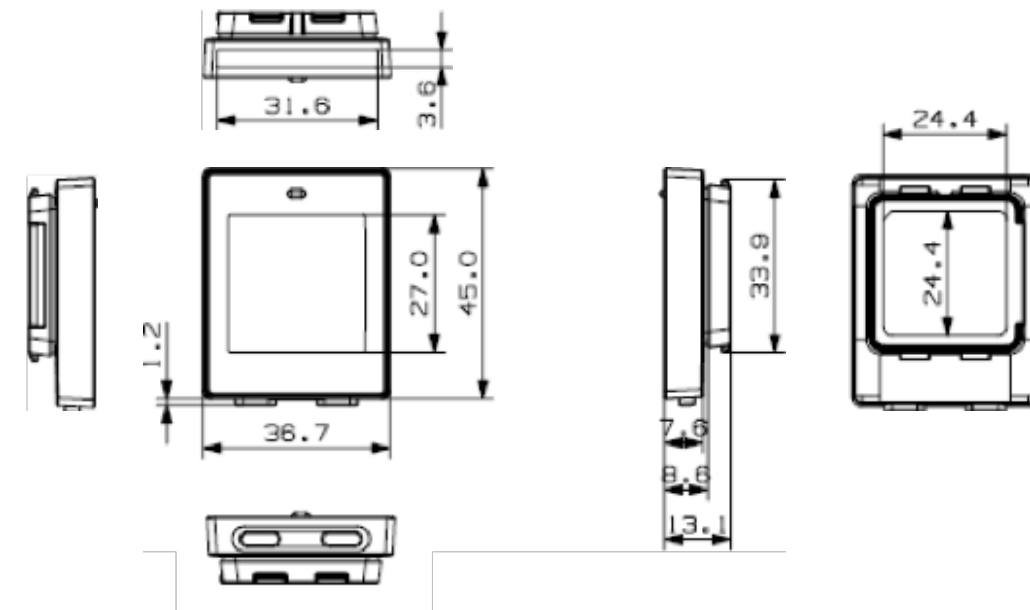
**5W**  
POWER CONSUMPTION



**USB**  
INTERFACE

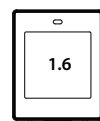


# TECHNICAL SPECIFICATIONS

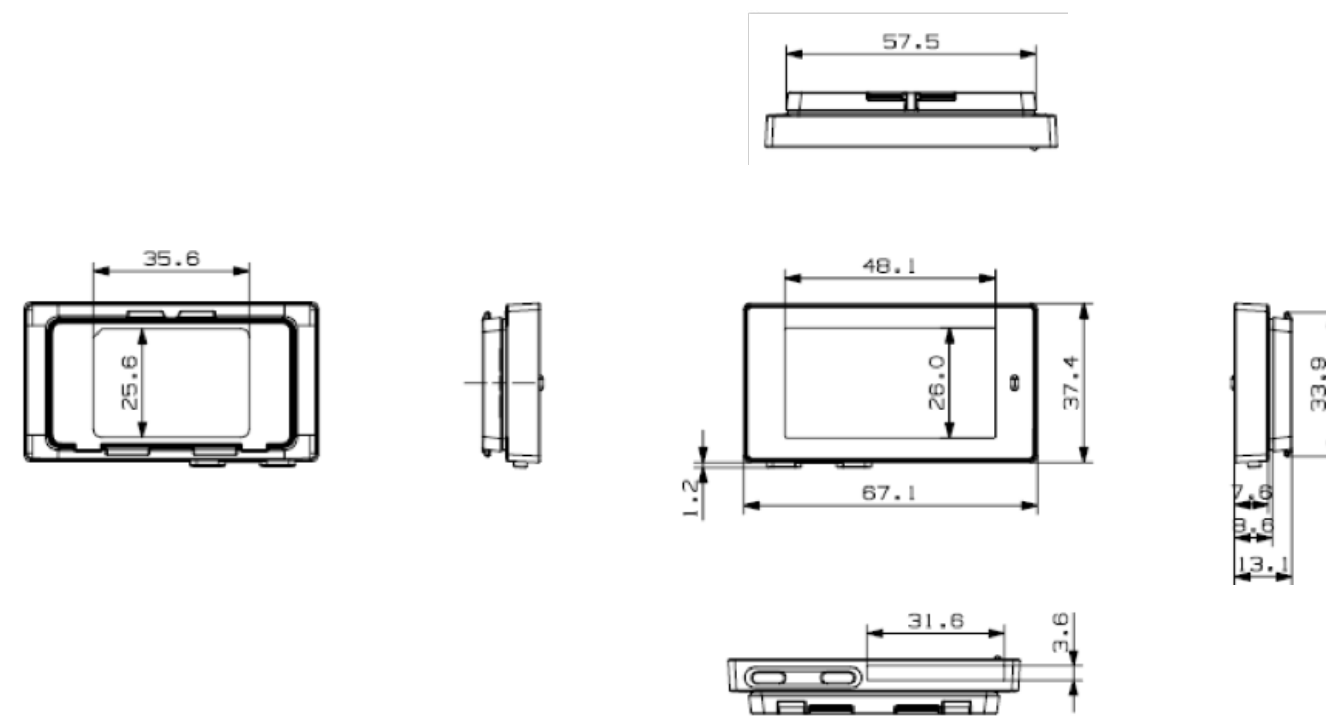


## TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL016H3WRA/WWW B:EL016H3BRA/WWW	<b>Pixels color</b> BW / BWR / BWY	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 36.7 × 45.0 × 13.1 (mm) 1.4 x 1.7 x 0.5 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 27.0 × 27.0 (mm) 1.0 x 1.0 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 200 x 200	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 184 dpi	<b>Battery</b> CR2450 × 1ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 5 years (2 Update/day) + 3 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes

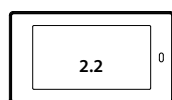


1.6 inch

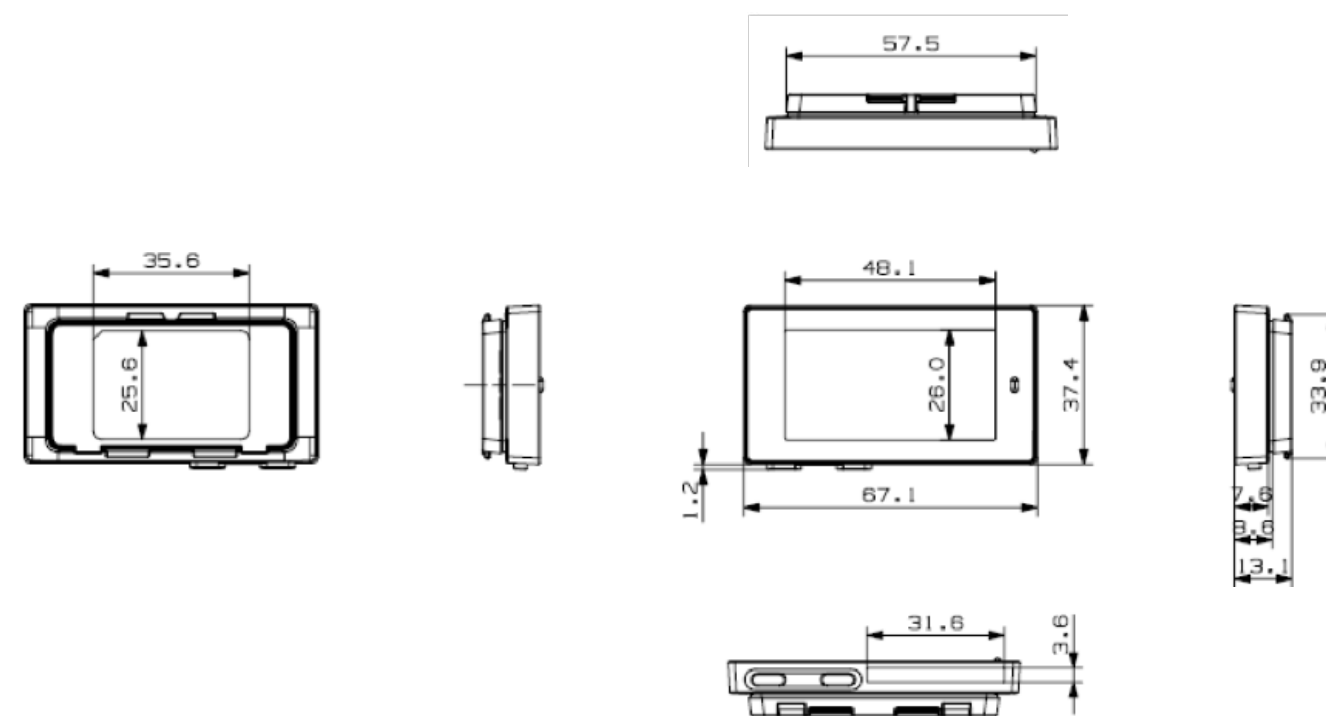


### TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL022H3WRA/WWW B:EL022H3BRA/WWW	<b>Pixels color</b> BW / BWR / BWY	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 67.1 × 37.4 × 13.1 (mm) 2.6 x 1.4 x 0.5 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 48.1 × 26.0 (mm) 1.8 x 1.0 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 296 × 160	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 156 dpi	<b>Battery</b> CR2450 × 2ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 10 years (2 Update/day) + 5 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes

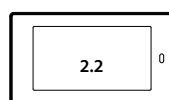


2.2 inch



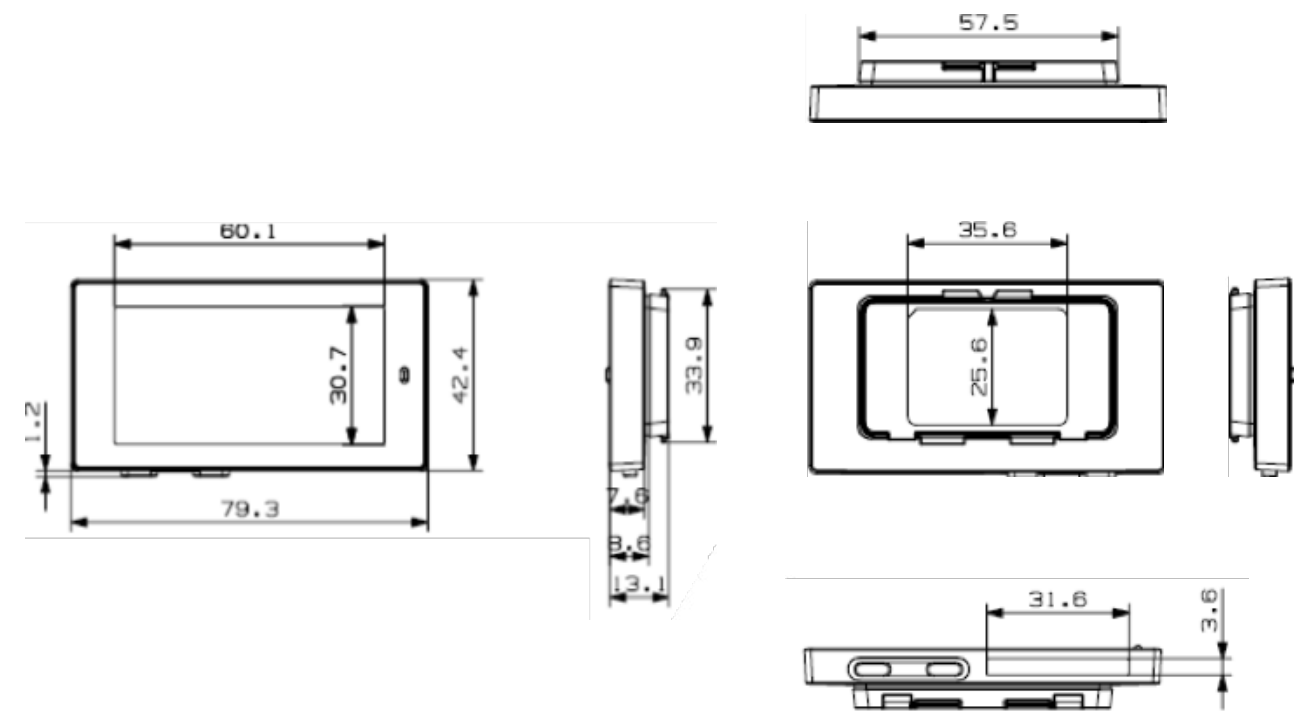
### TECHNICAL SPECIFICATIONS

<b>Model</b> W:ELF22H3WMA/WWW B:ELF22H3BMA/WWW	<b>Pixels color</b> BW	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 67.1 × 37.4 × 13.1 (mm)      2.6 x 1.4 x 0.5 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 48.1 × 26.0 (mm)      1.8 x 1.0 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 296 × 160	<b>Operating temperature</b> -25 ~ 0°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 156 dpi	<b>Battery</b> CR2450 × 2ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 3 years (1 Update/day)	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes



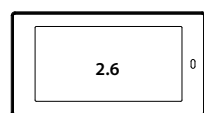
**2.2 inch  
freezer**



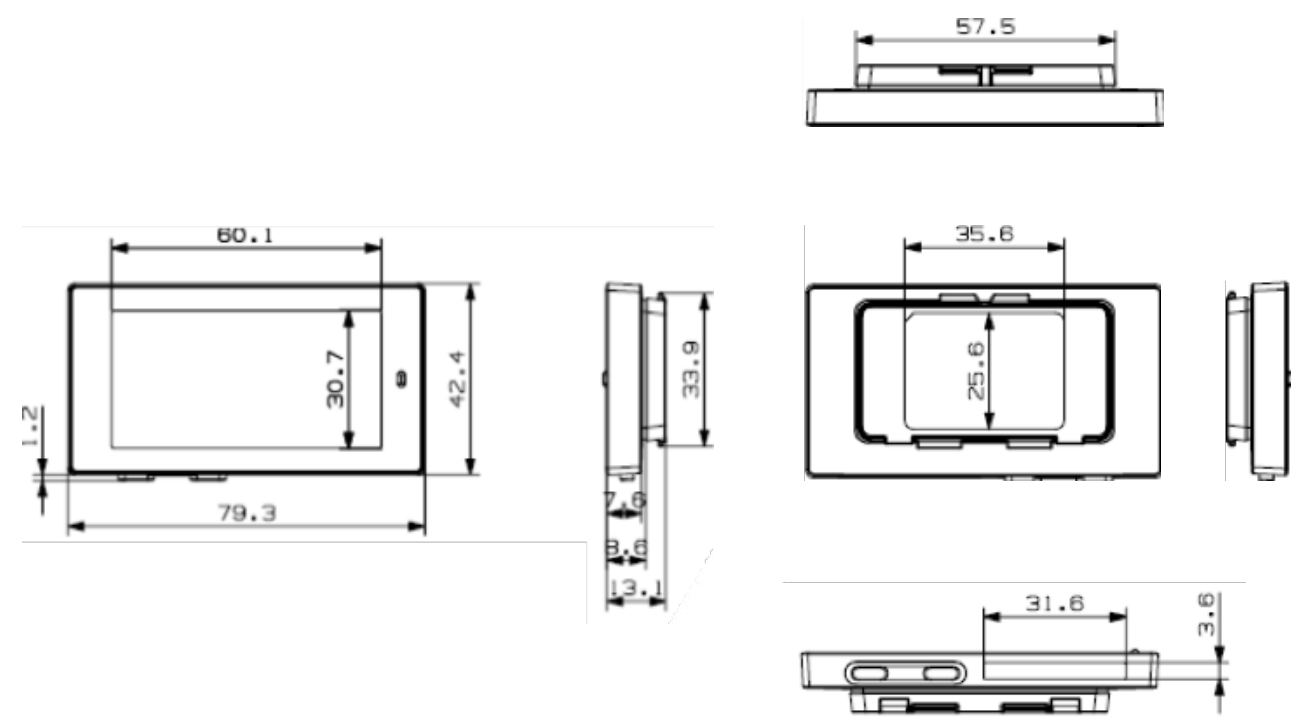


### TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL026H3WRA/WWW B:EL026H3BRA/WWW	<b>Pixels color</b> BW / BWR / BWY	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 79.3 × 42.4 × 13.1 (mm)      3.1 x 1.6 x 0.5 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 60.1 × 30.7 (mm)      2.3 x 1.2 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 360 × 184	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 152 dpi	<b>Battery</b> CR2450 × 2ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 10 years (2 Update/day) + 5 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes

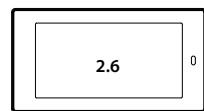


2.6 inch

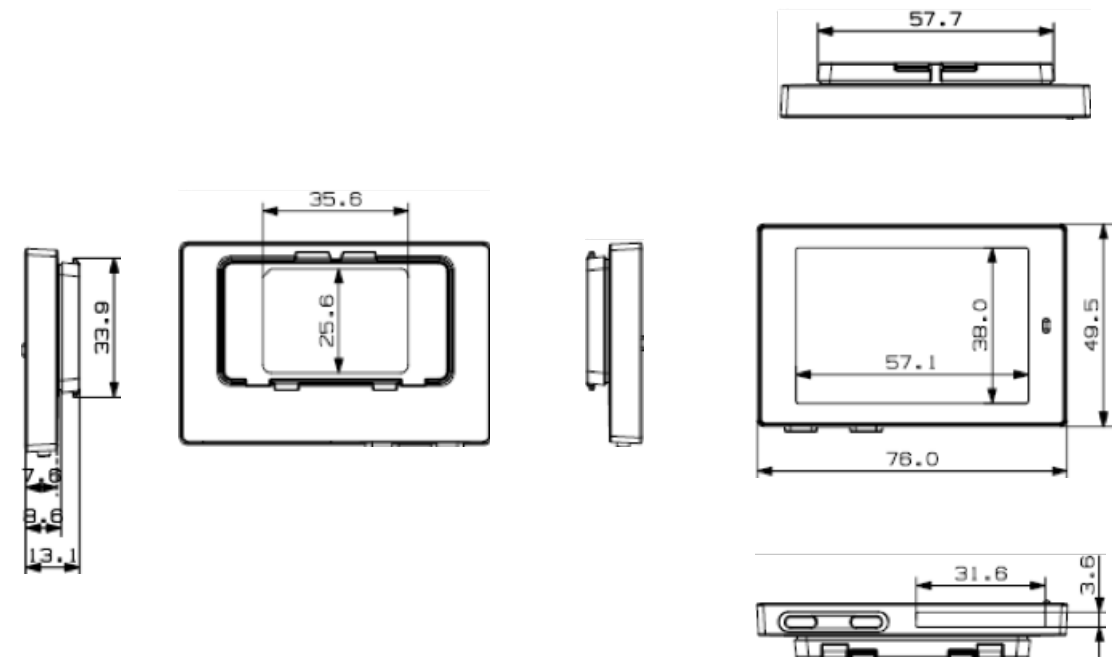


### TECHNICAL SPECIFICATIONS

<b>Model</b> W:ELF26H3WMA/WWW B:ELF26H3BMA/WWW	<b>Pixels color</b> BW	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 79.3 × 42.4 × 13.1 (mm)      3.1 × 1.6 × 0.5 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 60.1 × 30.7 (mm)      2.3 x 1.2 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 360 × 184	<b>Operating temperature</b> -25 ~ 0°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 152 dpi	<b>Battery</b> CR2450 × 2ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 3 years (1 Update/day)	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes

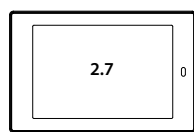


**2.6 inch  
freezer**

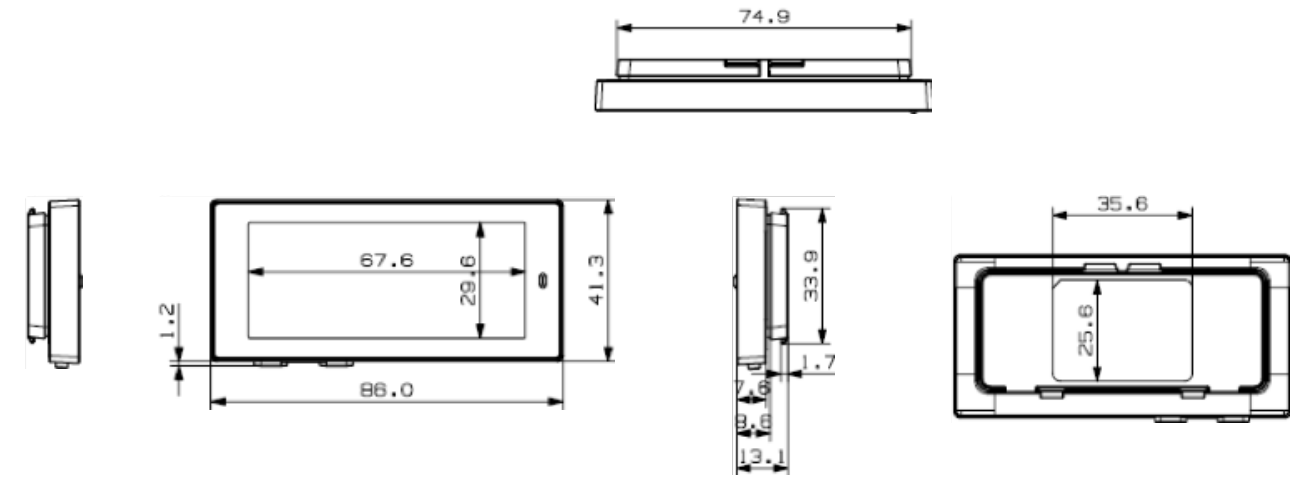


### TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL027H3WRA/WWW B:EL027H3BRA/WWW	<b>Pixels color</b> BW / BWR / BWY	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 76.0 × 49.5 × 13.1 (mm)      2.9 x 1.9 x 0.5 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 557.3 × 38.1 (mm)      2.2 x 1.5 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 300 × 200	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 133 dpi	<b>Battery</b> CR2450 × 2ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 10 years (2 Update/day) to 5 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes

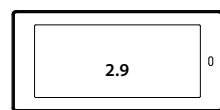


2.7 inch

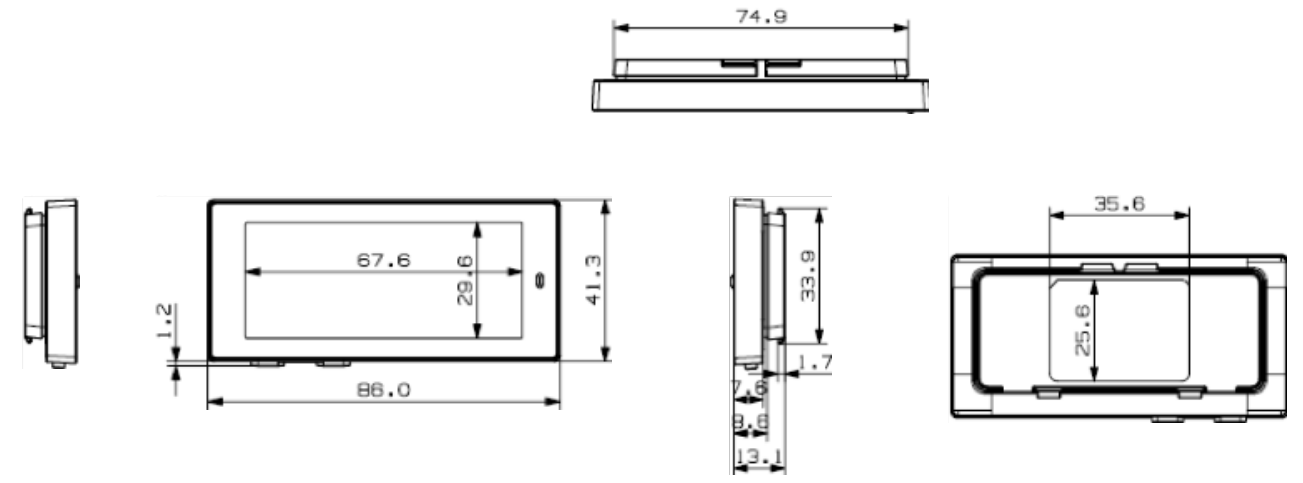


### TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL029H3WRA/WWW    B:EL029H3BRA/WWW	<b>Pixels color</b> BW / BWR / BWY	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 86.0 × 41.3 × 13.1 (mm)    3.3 x 1.6 x 0.51 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 67.6 × 29.6 (mm)    2.6 x 1.1 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 384 × 168	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 144 dpi	<b>Battery</b> CR2450 × 2ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 10 years (2 Update/day) + 5 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes

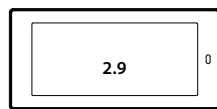


2.9 inch



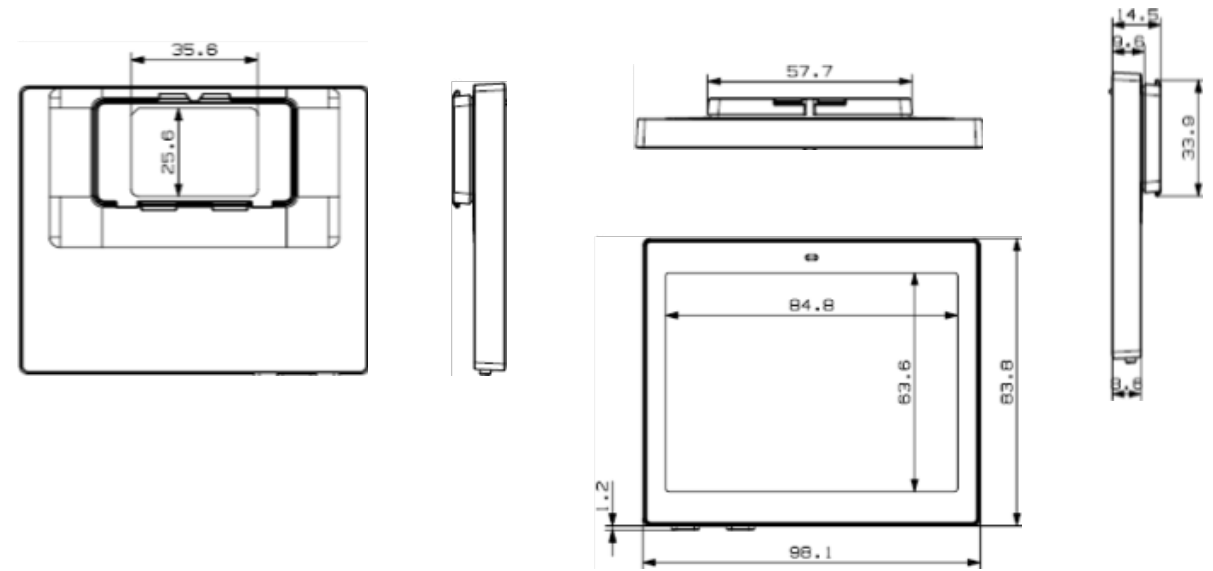
### TECHNICAL SPECIFICATIONS

<b>Model</b> W:ELF29H3WMA/WWW B:ELF29H3BMA/WWW	<b>Pixels color</b> BW	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 86.0 × 41.3 × 13.1 (mm)      3.3 x 1.6 x 0.51 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 67.6 × 29.6 (mm)      2.6 x 1.1 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 384 × 168	<b>Operating temperature</b> -25 ~ 0°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 144 dpi	<b>Battery</b> CR2450 × 2ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 3 years (1 Update/day)	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes



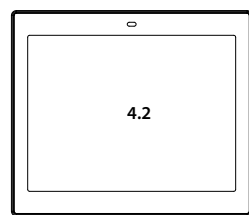
**2.9 inch  
freezer**



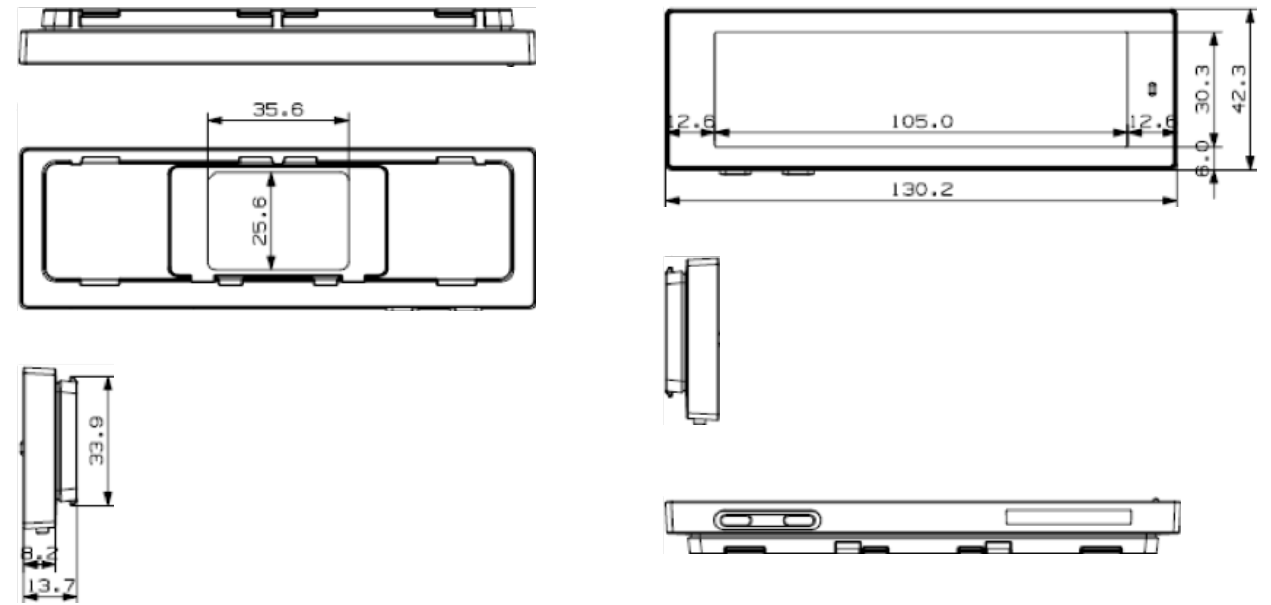


### TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL042H3WRA/WWW B:EL042H3BRA/WWW	<b>Pixels color</b> BW / BWR / BWY	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 98.1 × 83.8 × 14.5 (mm) 3.8 x 3.2 x 0.5 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 84.8 × 63.6 (mm) 3.3 x 2.5 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 400 × 300	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 120 dpi	<b>Battery</b> CR2450 × 2ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 10 years (2 Update/day) to 5 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes

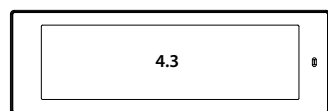


4.2 inch

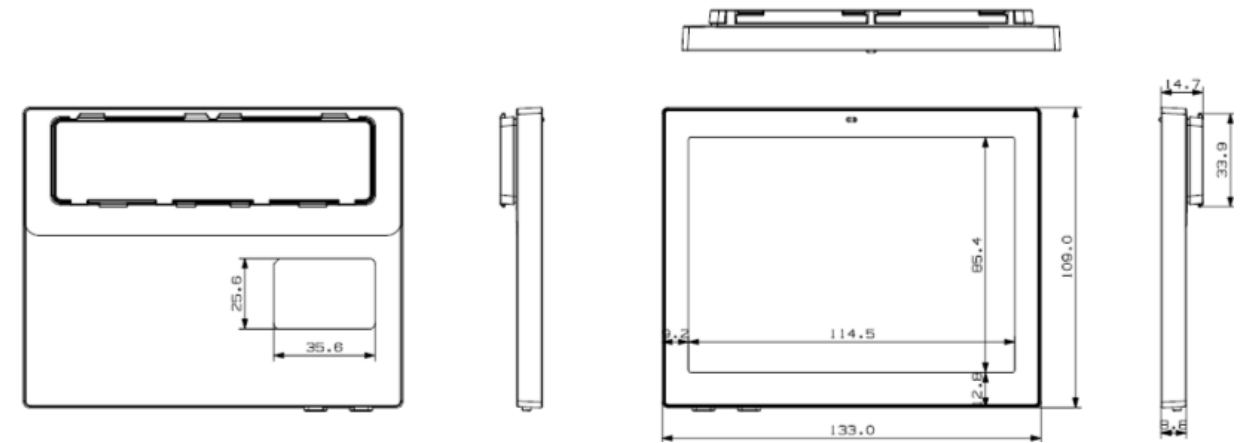


### TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL043H3WRA/WWW B:EL043H3BRA/WWW	<b>Pixels color</b> BW / BWR / BWY	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 130.3 × 42.4 × 13.9 (mm) 5.1 x 1.6 x 0.5 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 105.4 × 30.7 (mm) 4.14 x 1.20 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 522 × 152	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 125 dpi	<b>Battery</b> CR2450 × 2ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 10 years (2 Update/day) + 5 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes

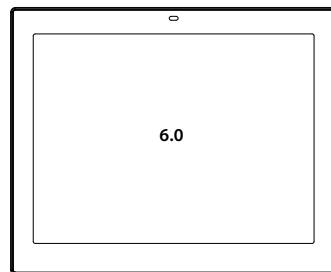


4.3 inch

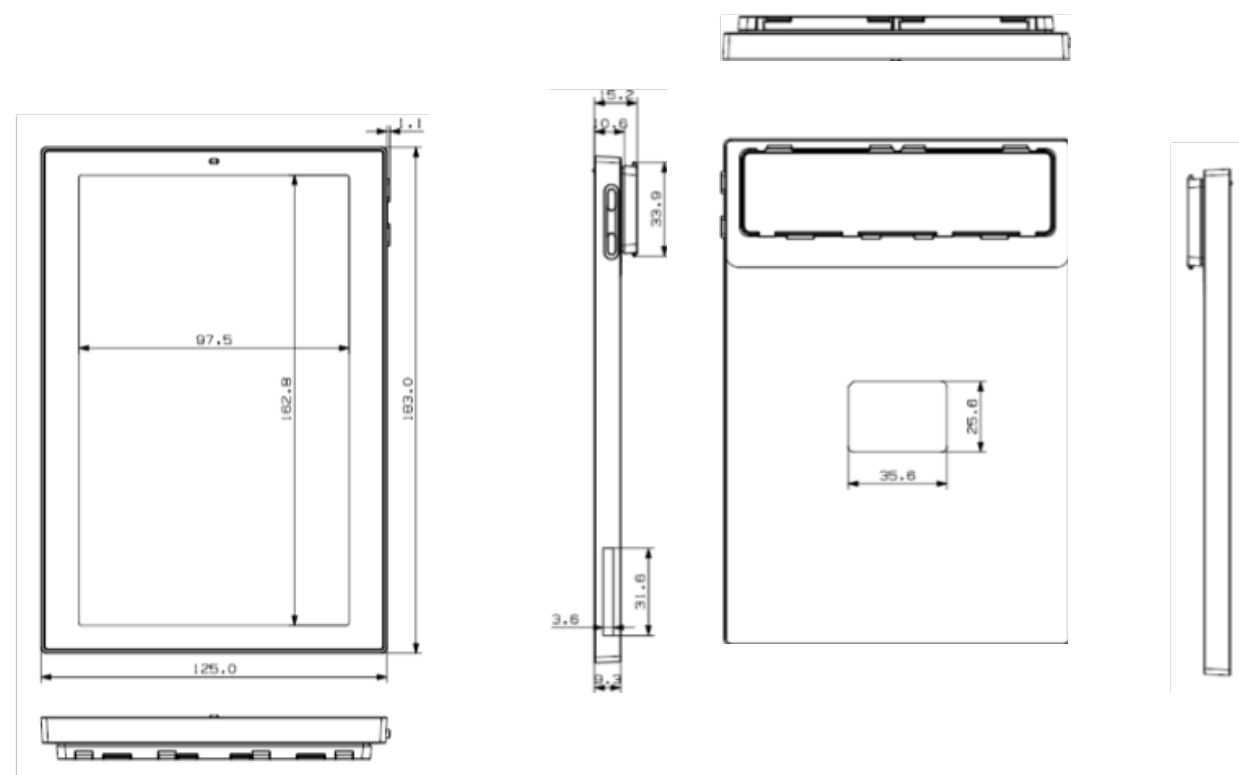


### TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL060H3WRA/WWW B:EL060H3BRA/WWW	<b>Pixels color</b> BW / BWR / BWY	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 133.0 × 109.0 × 14.7 (mm) 5.2 x 4.2 x 0.5 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 114.9 × 85.8 (mm) 4.5 x 3.3 (in)	<b>Usable pages</b> 3 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 600 × 448	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 132 dpi	<b>Battery</b> CR2450 × 4ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 10 years (1 Update/day) + 5 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes

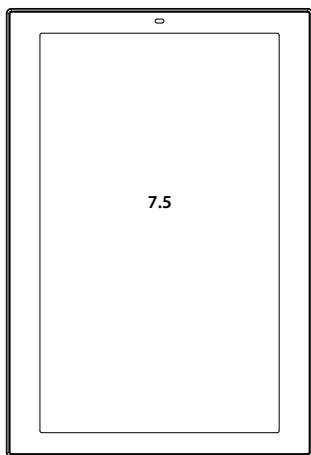


6.0 inch

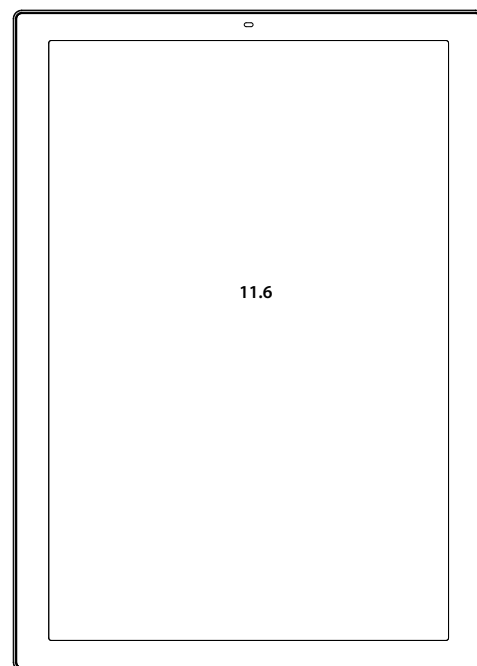
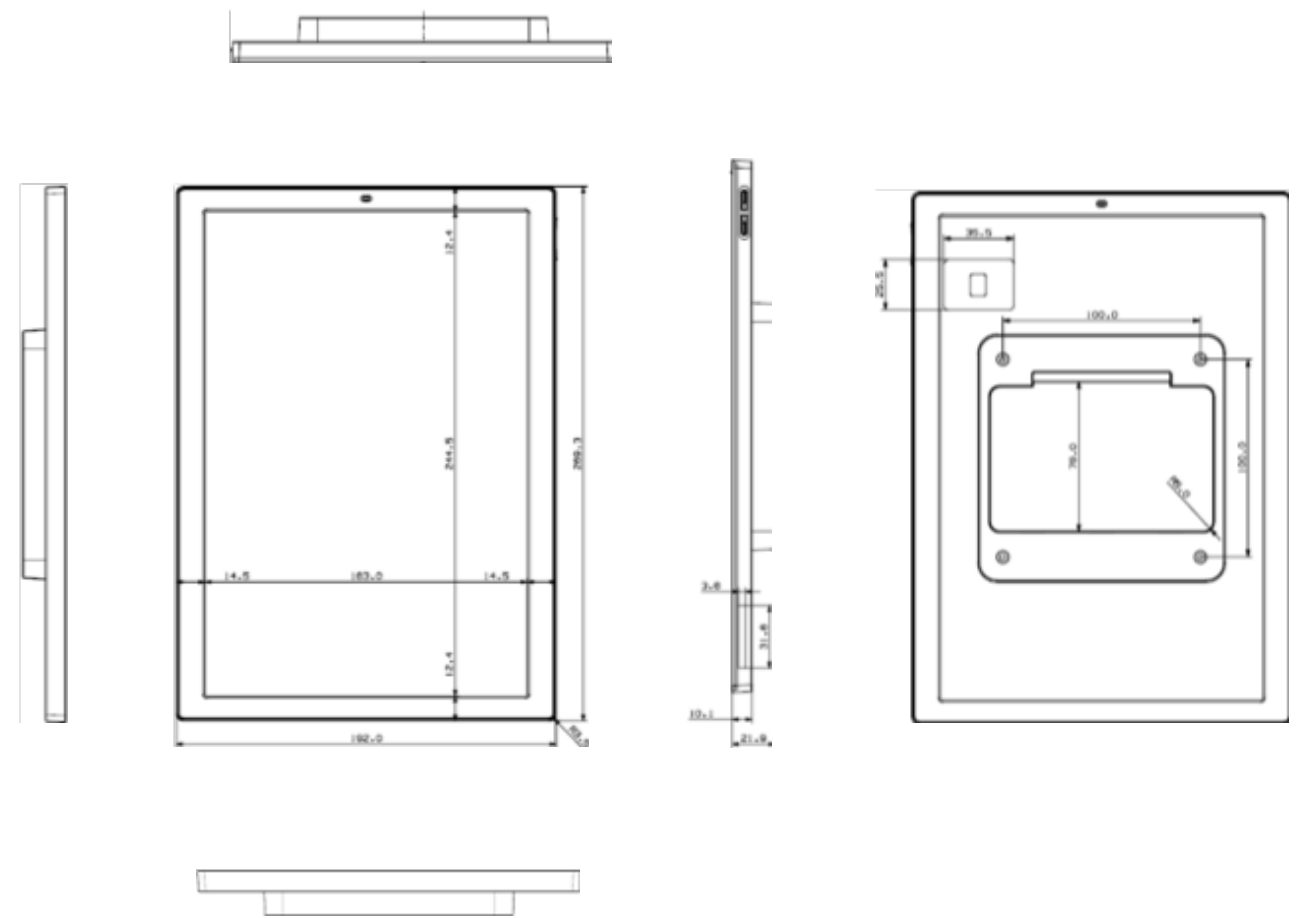


### TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL075H3WRA/WWW B:EL075H3BRA/WWW	<b>Pixels color</b> BW / BWR	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 125.0 × 183.0 × 15.2 (mm)      4.9 x 7.2 x 0.6 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 163.2 × 97.9 (mm)      6.4 x 3.8 (in)	<b>Usable pages</b> 3 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 800x480	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 126 dpi	<b>Battery</b> CR2450 × 4ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 10 years (1 Update/day) + 5 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes



7.5 inch



11.6 inch

### TECHNICAL SPECIFICATIONS

<b>Model</b> W:EL116H3WRA/WWW B:EL116H3BRA/WWW	<b>Pixels color</b> BW / BWR	<b>Compliance</b> CE, RoHS, FCC
<b>Dimension</b> 192.0 × 268.0 × 21.9 (mm)      7.55 x 10.5 x 0.8 (in)	<b>Viewing angle</b> Nearly 180°	<b>NFC</b> FeliCa NFC Forum Type 3
<b>Active display area</b> 163.0 × 244.5 (mm)      6.4 x 9.62 (in)	<b>Usable pages</b> Up to 7 pages	<b>Waterproof</b> IP67
<b>Resolution (pixel)</b> 640 × 960	<b>Operating temperature</b> 0 - 40°C	<b>Button</b> 2 Buttons
<b>Pixel density</b> 100 dpi	<b>Battery</b> AA × 4ea	<b>LED</b> 7 Colors (Red/Green/Blue/Yellow/Cyan/Magenta/White)
<b>Display technology</b> Full Graphic E-ink Display	<b>Battery lifetime</b> Up To 10 years (1 Update/day) + 5 years in 0°~10°	<b>ESL operating frequency</b> 2.4 Ghz
<b>Bezel color</b> White or Black, Customizable Color(Optional)	<b>Encryption</b> 128-Bit AES	<b>Wireless firmware update</b> Yes



## II. AIMS Software

SOLUM's very own Advanced Information Management System (AIMS) is a platform that can be deployed locally, through a central server, and via Cloud. With AIMS, our clients can get the most of their Newton label, resulting in increased business productivity and maximized return on their investment.

# AIMS

**AIMS**  
Site server

**AIMS**  
Central server

**AIMS**  
SaaS

The central command center of our Newton label, AIMS is an adaptable, scalable, and highly-intuitive ESL management software system specially designed to help you get the most out of our electronic shelf labeling solutions.

Our AIMS software server can be deployed in three environments - On-Site, Central Server/Cloud, and as a Service as a Software (SaaS). All these four options can be connected to all existing data sources which are relevant to your intended use of our ESL solutions, all while providing easy-to-use controls for commands such as price updates, stock replenishment, or locating distinct items in the warehouse.

For our retail clients such as hypermarkets, groceries, and fashion stores, AIMS software can

use data such as customer purchase history, stock levels, and product location to initiate timely promotional offers and discounts. In an industrial environment, AIMS software can activate applications such as pick to light, wireless Kanban, and smart ordering system to achieve a more seamless, cost-efficient, and sustainable warehouse and manufacturing operations.

From activating store promos to managing industrial warehouse and manufacturing operations, AIMS software is a holistic platform that powers our ESL solutions. With this software, you can easily manage all the ESLs located across all their premises and location in a centralized manner - resulting in reduced infrastructure costs, improved staff productivity, better data management, and increased revenue.



# Aims Site server

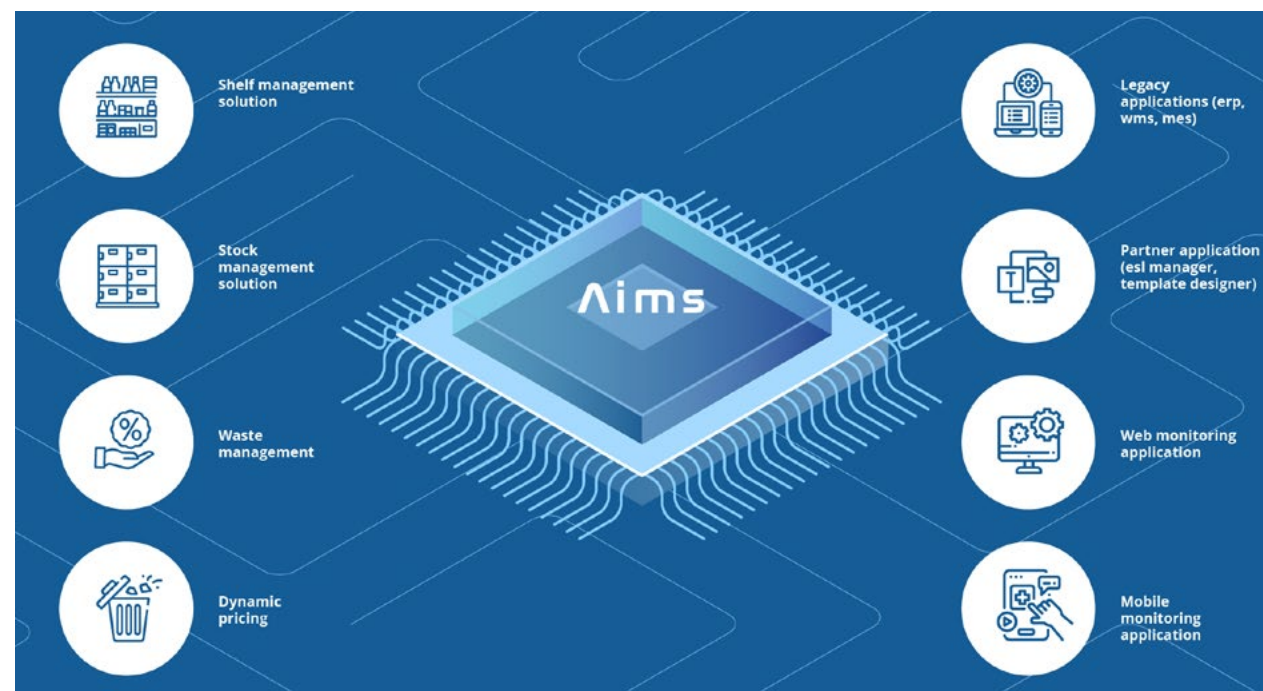
## I. AIMS SITE SERVER

With our AIMS solution, you will have a solid, reliable, and fast, ESL management software at your fingertips.

With our AIMS software package, you will not only own and manage the software, but you can also scale and customize it based on your unique preferences and needs. A flexible ESL management system, for flexible scaling, for flexible companies.

### AIMS Site Server Features

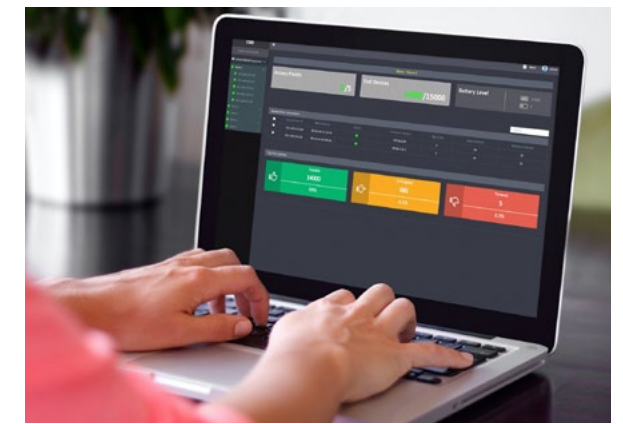
**1. Easy Integration with 3rd Party Solution** A modular architecture of AIMS makes it have a strong point in the integration with other IT solutions through rest API fast and easy.



### 2. Intuitive ESL Dashboard

AIMS has a store and central monitoring dashboards that display important information such as:

- The number and online/offline status of Gateways
- The number and online/offline status of Newton Labels
- Information/configuration of Gateways
- Detailed status of Gateways
- The number and list of labels associated with the Gateway
- Abnormal labels; such as those with low battery and bad RF signal strength
- Update status; view labels by status
- Detail information of labels and image preview.



### 3. Layout Designer

AIMS provides an easy and user-friendly Layout Designer tool that allows you to design the ESLs to fit the products you sell or to match your store's branding.



### 4. Web PDA / Mobile Application

With the web-based ESL management software for store PDA and mobile devices (Android or iOS), your staff can manage the ESLs remotely across your business premises.



# Aims Central server

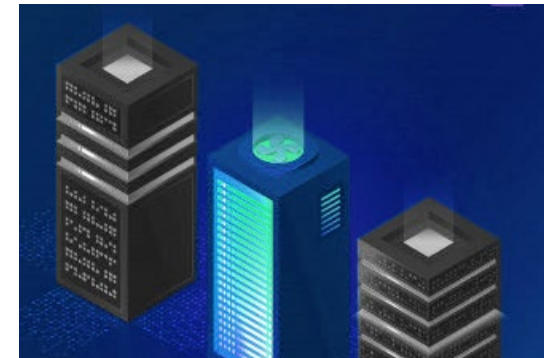
## II. AIMS CENTRAL SERVER

Keep your business IT infrastructure flexible by deploying AIMS in a Central Server. By using various features in AIMS Central Server, you can enhance performance on limited resources and improve information security.

**3. Parallel Processing** All instances share the load equally and process all tasks simultaneously without interfering with our system processing.



**4. High Availability** AIMS Central Server works as Active-Active server mode. If one system is down, the load will be shared by other existing WAS (instance of AIMS server) automatically.



### AIMS Central Server Features

**1. Horizontal Scalability** The user has the option to horizontally scale the server. So whenever there is more load, one can add more to other PC.



**2. Load Balancing** AIMS Central Server can divide all loads coming to the server in an equal manner and can also be configured. This allows the server to utilize all available resources (RAM and CPU) in different instances fairly.



### AIMS Central Server Security

With so much valuable data filtering through AIMS Central Server system, we also ensure that we pay attention to its security. SOLUM improves the security of our system and mitigates threats with robust data recovery and backup, user authentication, and disaster recovery.



DATA RECOVERY



BACKUP



WARNING & STATUS REPORTING



USER AUTHENTICATION



DISASTER RECOVERY



# Aims SaaS

## III. AIMS SaaS

SOLUM provides SaaS model using a robust, open, and flexible cloud computing platform. The primary business benefit of this is that it will not require you to maintain your own data center nor store server to manage your ESLs – all you need to do is to install the gateway, put the ESLs in place, and get a hosting service from SOLUM.

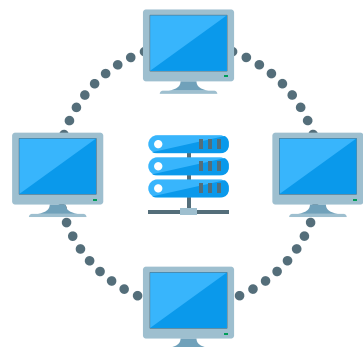
### Why AIMS SaaS?



**1. Reduced Implementation Time** S-SaaS is already installed and configured, reducing the possibility of any issues that can get in the way of the software deployment.



**2. Maximum Performance** By using optimum auto-scaling criteria and resource monitoring features, AIMS Central Server minimizes the redundancy in the production environment and ensure the high performance even in the peak hours.



**3. High Scalability and Integration** The need to buy another server or software when your capacity increases is no longer required as we will provide you with those as the need arises.



**4. Seamless Upgrades** We will manage software updates and upgrades for you, eliminating the need to install or download patches. At any one time, you can be assured that you will always have the most up to date AIMS software.

## AIMS SaaS Features

The AIMS SaaS comes with all the AIMS Site Server and Central Server features, but with the addition of the following:



**A stable operation which works on Cloud**



**User Authentication / Authorization**



**Horizontal Scalability for multiple and heavy traffic**



**Fast & continuous deployment of services & features**



**Performance & status monitoring and History check**



**Easy to manage multiple location stores (price matching, stock, promotion, etc.)**

## AIMS SaaS Security

Security is an important factor when moving to the cloud. That's why we make sure that our software is bolstered with all the necessary security measures and controls that will ensure your important business data are safe from potential threats.

### Identity Management

- User Authentication Based on Microsoft Azure Active Directory

### API Authentication and Authorization

- Authenticate calls to the API to registered users only
- Track who is making the requests
- Track usage of the API - Block or throttle any requester who exceeds the rate limits
- Apply different permission levels to different users.

### Application Delivery Control

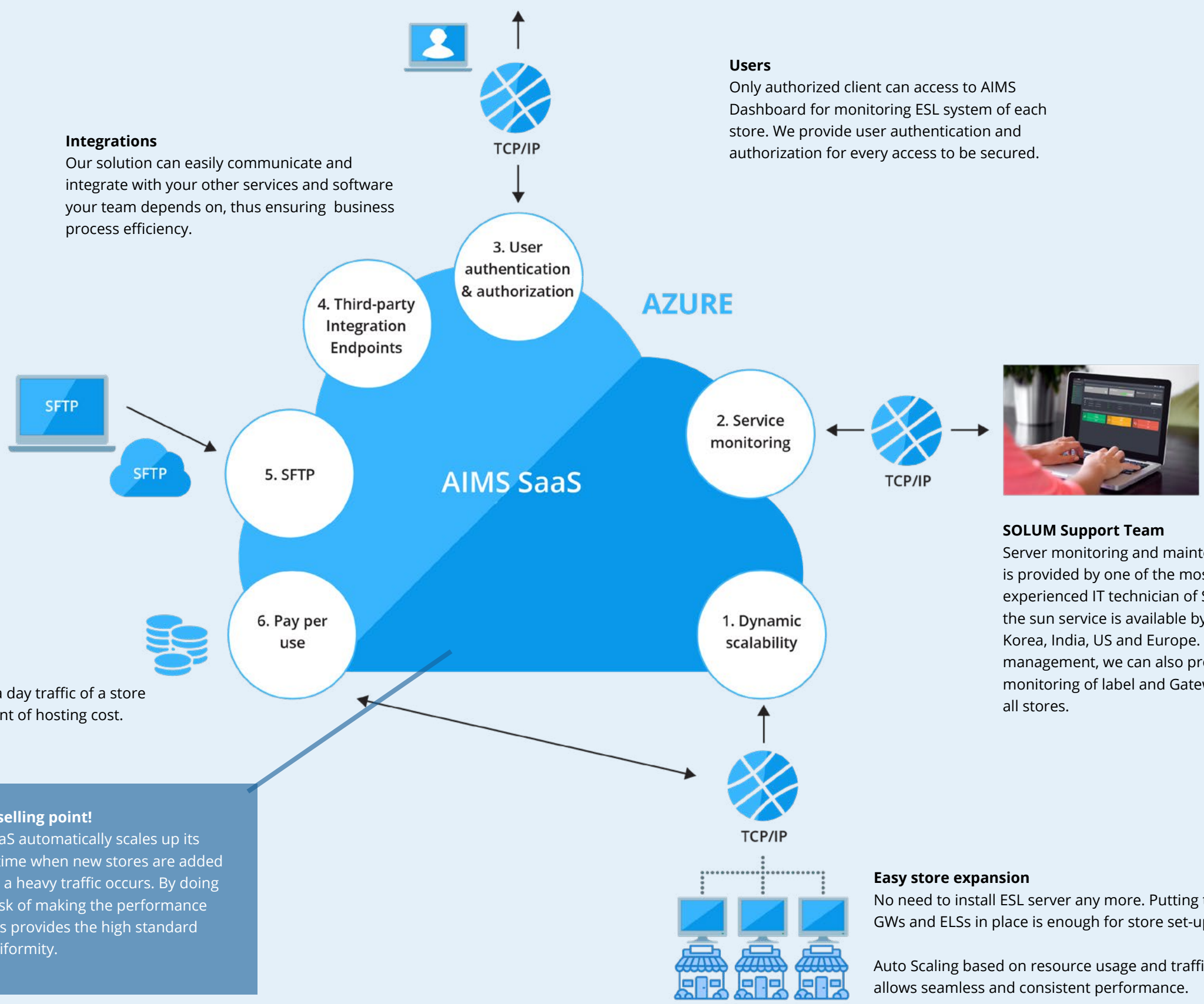
- Secure Sockets Layer termination and end to end SSL/TLS encryption
- WAF\_v2 : Centralized protection (Faster react by centrally patching a known vulnerability)

### Privacy

- All information is stored on Azure storage and Azure SQL Database
- Both encrypt data at rest by default using Azure Disk Encryption

### Logging and Auditing

- All logging data is stored on the internal location. Retention period is configurable



**Integrations**

Our solution can easily communicate and integrate with your other services and software your team depends on, thus ensuring business process efficiency.

**Users**

Only authorized client can access to AIMS Dashboard for monitoring ESL system of each store. We provide user authentication and authorization for every access to be secured.



**SOLUM Support Team**

Server monitoring and maintenance service is provided by one of the most skilled and experienced IT technician of SOLUM. 24/7 follow the sun service is available by service team of Korea, India, US and Europe. Not only for the server management, we can also provide a whole system monitoring of label and Gateway health check for all stores.

**Cost**

Pay per use based on a day traffic of a store with a minimum amount of hosting cost.

**This is the key selling point!**  
SOLUM AIMS SaaS automatically scales up its capacity in real-time when new stores are added or when there is a heavy traffic occurs. By doing so, there is no risk of making the performance down and always provides the high standard performance uniformity.

**Easy store expansion**

No need to install ESL server any more. Putting the GWs and ELs in place is enough for store set-up.

Auto Scaling based on resource usage and traffic allows seamless and consistent performance.



## III. Client References

Our list of clients serves as the hallmark of our excellence as ESL partner. Since our earliest days, we've catered from start-ups to multinational companies with the same partnership approach and commitment at the core of every engagement. SOLUM always strives to achieve great successes and lasting relationships with our clients.



**Sector:** Super/Hyper  
**Country:** Canada  
**ESL Introduction Year:** 2019

### Requirements

One of the main drivers for Loblaws to invest in ESL was the desire to both simplify and revolutionize their shelf labeling processes. They recognized that a fast, secure and reliable two-way wireless transmission system was needed in-store to enable real-time feedback on the status of the labels. It requested a product solution with clear shelf label visibility from the shopper's perspective. In addition, they were seeking a flexible solution for all types of stores: supermarket, hypermarket, express stores with refined design, easy to use and low infrastructure cost

### Solution

SOLUM has reached an agreement after 4 months of an intensive pilot review. This includes all banners stores of the retailer coast to coast across Canada

and the installation started in January 2019. The total number of ESL tags in this roll-out will be close to 10 million per year. About 40K tags per store will be installed. The project is expected to be completed at the end of 2021. This deployment is by far, the largest ESL deployment in the history of US and Canada, not only for the groceries but also in all the retail industry.

### Introduction effect

Now with ESL technology linking the POS price data with ESLs, Loblaws stores can automatically display accurate pricing information real-time and implement dynamic pricing at the shelf level. Using ESL, our client also enhanced the shopping experience by taking another step forward to digitizing the store and increasing the eco-friendliness of the store environment.





**Sector:** Department Store  
**Country:** USA  
**ESL Introduction Year:** 2017

**Requirements**

As a leader of technology and innovation, Macy's has been evaluating digitizing product pricing and information for years. Prior to SOLUM, all product-based electronic labels were shelf based and could not be used in the department store environments. Collaborating with and understanding Macy's requirements, SOLUM was able to design and develop the Item Label line. SOLUM Item Label not only provided the functionality of digitizing but also a new sleek design worthy of use with designer and fashion products.

**Solution**

SOLUM's design team worked with Macy's team to produce a vast lineup of designs for their different needs, which was ultimately narrowed down to 3 specific designs. SOLUM was able to expedite design,

development, and manufacturing of 500,000 ESLs within 3 months to meet Macy's target timeline. All this was possible because of SOLUM's in-house capabilities. For tag management, SOLUM provided the AIMS Central Server allowing Macy's to be able to centralize tag updates and pricing from a single location, helping save on infrastructure costs.

**Introduction effect**

Store associates no longer have to replace paper prices, they are able to focus more time on customer service and support. With SOLUM ESL, Macy's is able to update prices overnight for all stores and also schedule price changes during the day to provide dynamic store pricing, improve & efficiency, and increase sales. With the initial success, Macy's and SOLUM continue to discuss new design and application for future expansion.



**Sector:** Liquor Retail  
**Country:** Canada  
**ESL Introduction Year:** 2016

**Requirements**

In 2015, The Beer store started evaluating ESL solutions of various ESL vendors. They were looking for an efficient solution that offered centralized control of pricing and promotional information for all 445 of their stores all over Canada. Finally, in 2016, after thorough research, The Beer Store selected SOLUM as their ESL provider.

**Solution**

The Canada-based retailer is dedicated to doing its part to save the environment. And they manage to do this in a very unique way: they take back all the bottles, cans, cartons, caps, kegs, plastic bags, and can rings from consumers, as well as from the 19,850 bars and restaurants to which they sell their products to. All collected materials are then either reused or recycled.

SOLUM is extremely proud to be working with a company whose primary aim isn't to simply gain revenue but to make sure they reduce their carbon footprint and set an example for others in the industry. To help them fulfill this cause, SOLUM has delivered high-quality 3-color ESL which is designed and manufactured in-house to The Beer Store.

**Introduction effect**

Since they started working with SoluM, The Beer Store has saved on infrastructure investment and maximized management efficiency and ROI without having to build a server for each store. They are also able to reduce their consumption of paper labels significantly, allowing them to make their store operations more efficient and sustainable over the long run.





**Sector:** Consumer Electronics  
**Country:** Canada  
**ESL Introduction Year:** 2019

#### Requirements

In 2019, Rogers and Fido were looking for a solution provider that could help them unlock the full potential of a highly innovative ESL system for their telecommunications chain stores. While it was important to get the shelf labels customized to the colors of their respective brands, they were especially interested in installing a cloud-based ESL solution, which could easily be integrated into the IT infrastructure already in place, thus allowing them to have a fully-automated operation for pricing and product information labelling.

Since Canadian law imposes language regulations for specific regions regarding product information, the displays had to also be capable of displaying bilingual information in English and French to the customers.

#### Solution

SOLUM, the market leader for ESLs in North America, is proud to welcome both Fido and Rogers among its ever growing roster of ESL cloud server platform users. SOLUM's own optional cloud service comes at a competitive price and offers the same advantages as other server solutions proposed by

SOLUM, while freeing Rogers and Fido from the hassle of having to maintain and secure their own ESL server infrastructure.

#### Introduction effect

SOLUM ESL's are not a mere replacement for paper labels, their application ranges from better operations to better customer service and much more! They also come packed with enterprise ready software that can be easily installed onto almost any existing server infrastructure. Since Rogers and Fido opted for SOLUM's own cloud-based ESL server solution, they were able to fully leverage the functionality of SOLUM ESL's through the power of cloud computing!

SOLUM's shelf labels also come with multiple customization options. For Rogers and Fido the shelf labels were customized to red and yellow respectively, thus meeting their brand identity requirements. The legal obligations imposed by Canadian law could also be met, since SOLUM ESL's allow for bilingual display of price and product information. In fact, they even allow for up to seven screens to be displayed, and if needed, in different languages.



**Sector:** Home Improvement/Retail  
**Country:** U.S.  
**ESL Introduction Year:** 2020

#### Requirements

Ensuring efficient store operations has been extremely vital to Lowe's success as a retailer. In order to streamline their operations and improve their product pricing and promotional activities, Lowe's decided to shift from using paper shelf labels to electronic shelf labels.

The ESL solution they looked for should allow Lowe's to ensure accurate price changing during holidays which often overlap, retain their sensitive data such as product information and sales analytics in-house, and execute successful in-store promotions.

#### Solution

Lowe's selected SOLUM as its ESL solution provider in 2020, primarily because of the newly introduced Newton label, which provides the fastest update speed in the market today. The total number of ESL tags in this roll-out is 565,000 – all are custom-designed with Lowe's logo prominently displayed in the lower bezel. The project is expected to be completed by the 3rd quarter of 2020.

#### Introduction effect

Newton's update speed meant that Lowe's could change the product prices across their stores in real-time, which enabled them to develop a more sophisticated dynamic pricing strategy that helps them stay competitive.

Aside from its speed, Newton's custom bezel design has also helped Lowe's achieve consistent brand identity inside their stores. The data the ESL gathers is also helping Lowe's to gain insights about their customer behavior, allowing them to create more effective and timely promotion strategies.



Thank you very much for  
selecting SOLUM to receive  
the Red Dot Product Design  
Award 2020!



reddot winner 2020  
industrial design



# Become a Partner

We want to partner with experts in their industry, tech-forward business leaders who value innovation and quality above all else, and companies with successful sales track records. But more than that, we want partners whose work ethic and vision align with ours.

We are setting our sights long-term.

## CRITERIA

- Capability to provide onsite service nationwide.
- Capability to handle servicing for both software and hardware SOLUM ESLs.
- Willingness to undergo education and training for SOLUM ESL solutions.
- Has at least 5 years experience in retail service section
- Positive feedback from their current/previous retail customer.
- Provide service with a reasonable price but still sustainable.

## WHY PARTNER WITH US

SOLUM works in collaboration with many of the world's leading retail brands. We have established a name for ourselves globally, having provided 70 million tags to over 6,000 stores in 35 countries.

## BECOME A PARTNER

Align yourself with the best, and reap the benefits. Join us on SOLUM.



# SOLUM

Solution provider.



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