M2COMM

M2COMM ELSA-E 2.9 Inch ESL Tag (For Freezer)

Hardware Specification

(Model ES29-F)

PLATANUS™

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Revision Control

Ver.	Date	Description of Change	Approved
1.0	11/09/2018	First Release	

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1. Objective & Scope

1.1 Objective

This document defines the features and performance requirements for the M2COMM ELSA-E 2.9 inch ESL tag for freezer, to enable the successful integration with the other network equipment required for an ELSA system. To achieve this goal, the requirements detailed within this document will permit an independent evaluation.

1.2 Scope

This specification is a definition of the M2COMM ELSA-E 2.9 inch ESL tag for freezer, from a functional and design perspective.

This document may be updated as the product design evolves.

1.3 Glossary

ESL	Electronic Shelf Label
PCB	Printed Circuit Board
DPI	Dots Per Inch
mm	millimeters
RF	Radio Frequency
mAh	milli-ampere hour
ISM	Industrial, Scientific and Medical
PC	Polycarbonate
MAC	Media Access Control
EMC	Electromagnetic Compatibility

2. Overview

The M2COMM ELSA-E 2.9 inch ESL tag for freezer is available either a white or black bezel enclosed within a clear plastic housing, and monochrome (Black and White) display.

The tag utilizes a high resolution e-paper display for 180° viewing.

Communications with the tag is via a unique wireless protocol, M2COMM's proprietary Platanus network, tuned to optimize power consumption and network efficiency.
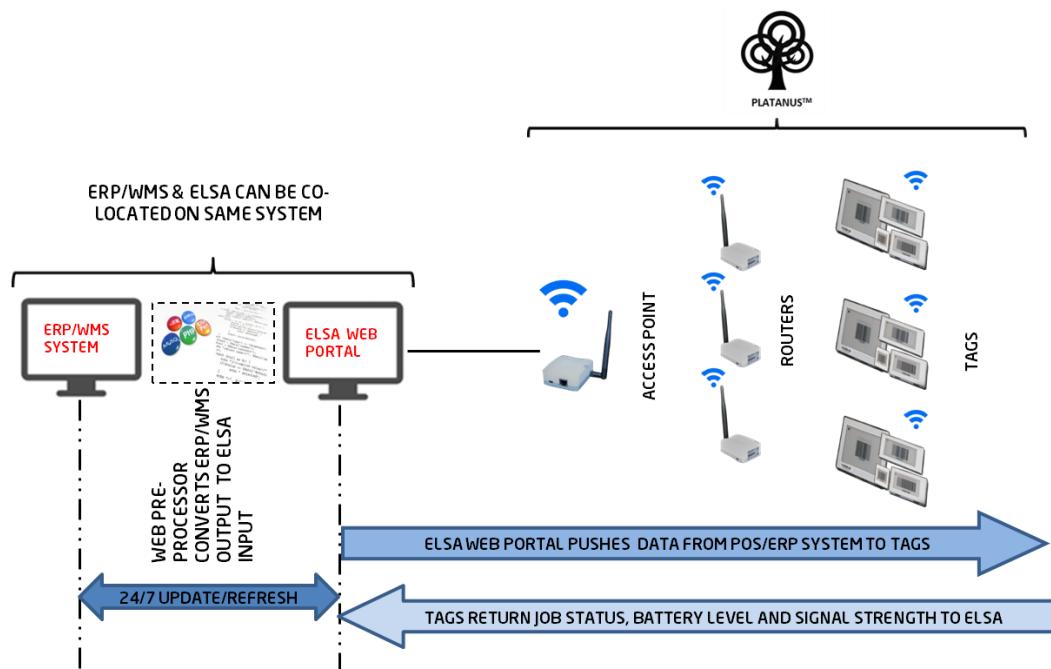
2.1 Operating Frequency

Radio Channel	
Frequency Range	Country/Region
864.25MHz - 867.75MHz	Europe
903MHz - 927MHz	US

Maximum RF Output power: 10.88 dBm (US)

3. Key Features and Components

3.1 Housing

The tag housing will consist of three individually molded plastic parts comprised of the front cover, rear PCB/battery housing and the battery access cover.

The housing shall be designed to allow easy customer access to the replaceable coin cell batteries.

The housing shall be designed for easy access to a recessed wake-up/reset button that will be mounted on the tag PCB assembly.

The rear housing shall be designed to accommodate easy assembly to customer shelf level pricing display rails and/or the M2COMM shelving mount.

3.2 Power

The rear housing will be designed to accommodate three lithium coin cell batteries

3.3 Display module

Custom E-Ink ePaper display (active matrix)

Size	Pixel Dimensions	Resolution (DPI)	Active Area (mm)
2.9 inch	296 x 128	112	66.1 x 28.3

4. System Physical Constraints

4.1 Power

3X Lithium Coin Cell batteries – CR2032
Each CR2032 battery energy reservoir is rated 210mAh (at 2.0V)

4.2 Installation Environments

The tag shall comply with the requirements defined as a retail signage product, operating within the ISM band frequency range.

4.3 User Replaceable Items

- Lithium Coin Cell Batteries
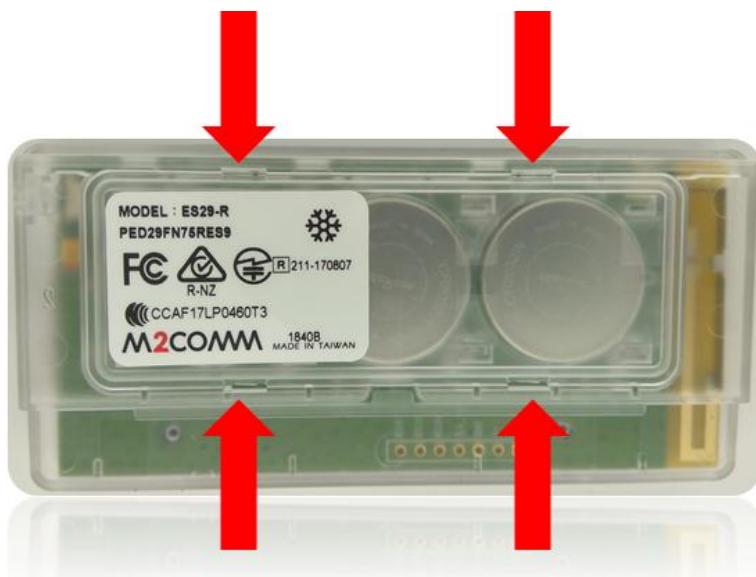
Locations of recessed tabs for battery cover removal

4.4 Service Life

Battery service life may vary according to the use scenario and environment.

For reference, the battery life is estimated of 45 months, continuous use at temperature range from 10°C to -25°C, with one update per day without external interference or system abnormalities.

In addition, the following components shall have evidence (from testing and analysis) that they will have the required L10 life in a normal service environment:

- Lithium Coin Cell Batteries

5. Dimensions & Weight

5.1 Material

Polycarbonate resin, TEIJIN PC Panlite L-1225L series

5.2 Key Dimensions

5.2.1 Housing Length x Width x Depth
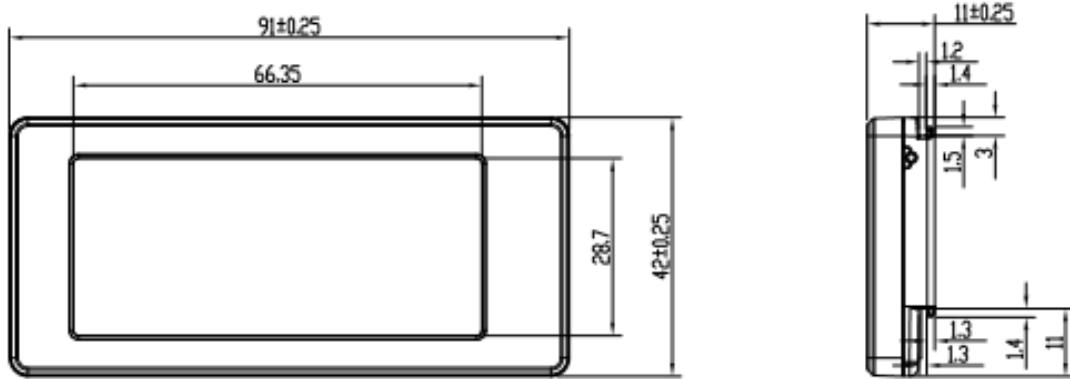
Dimensions are in mm
Dimensional tolerance ±0.25mm

5.3 Part & Subassembly Dimensions & Tolerances

Full dimensional tolerance analysis and critical-to-function analysis will be performed on the following;

- PCBA module
- Housing

5.4 Weight, Total

Assembled weight is 42g maximum, excluding transit packaging, documents, accessory kit, etc.

6. Labeling Requirements

Each tag shall carry the following labels.

6.1 Unique Tag MAC address and Barcode Label

Barcode shall be Code 128 compliant

Label shall be adhered to the bottom edge of the tag as shown above.

6.2 Manufacturer and Compliance Label

The manufacturer and compliance label shall be adhered to the rear of the tag as shown above.

7. Design for the Environment (DFE)

7.1 Hazardous Materials in Product or Process

No components or process containing the following material maybe used;

- Beryllium Oxide
- Cadmium
- Silicone
- Mercury
- Chlorinated paraffin's
- Poly Chlorinated Biphenyl (PCB)
- Polychlorinated Naphthalene (PCN)
- Poly Chlorinated Triphenyl (PCT)
- Poly Brominated Biphenyl Ethers/Oxides (PBBE/PBBO)
- Tetra Brominated Biphenyl A (TBBA)
- Chlorofluorocarbons (CFC)
- Class 1 Ozone-depleting substances

Coin Cell type batteries contain mercury, silver, cadmium, lithium, or other heavy metals as their main component and should be disposed off in accordance with country/region regulations.

8. Serviceability

8.1 Maintenance Items & Intervals

No subsystems or components shall require scheduled maintenance intervals.

8.2 Switches

The tag will be fitted with a multi-function switch, in the form of a momentary action switch.

The switch shall be located on the PCB and will be accessible via a hole in the side of the rear cover to protect against accidental operation.

Recessed switch location
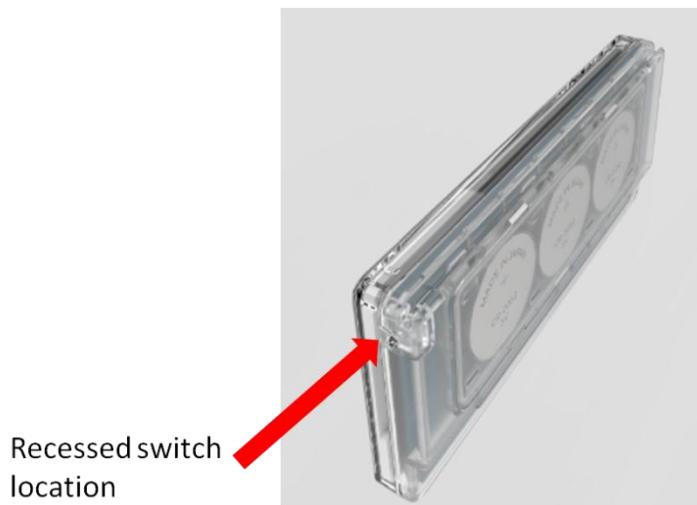
Switch Functions;
 I. Wake up (Short Press)
 II. Deep Sleep (Long Press for 3~5 seconds)
 III. Show Device Barcode Address and firmware version (Double-click)

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IV.   Show Devices detailed information (Double-click)

V.   Show Main Image (Double-click)

9. *Thermal*

9.1 *Component Operating Temperature Limits*

In any permitted configuration, all the tag components shall remain within the component manufacturers' normal operating specifications.

10. *Climatic Environments*

All tag features shall function normally in the operating ranges listed below. All tag features shall endure the non-operating ranges listed below without cosmetic or functional damage.

10.1 *Operating Temperature and Humidity*

-25°C to +10°C, 16 hrs dwell at extreme; IEC 60068-2-1
35% to 55% RH at 40°C, non-condensed; IEC 60068-2-3

10.2 *Shipping/Storage Temperature and Humidity*

10.2.1 *Shipping*

Temperature: -20°C to +50°C
Humidity: 35% to 80% RH
Duration: <240 hours (10 days)

10.2.2 *Storage*

Temperature: 0°C to +40°C
Humidity: 35% to 80% RH
Duration: <6 months

11. Mechanical, EMC, Environmental & Safety Compliance

11.1 Random Vibration

1 to 200 Hz, 1.15 Grms, 30 minutes in Z axis, 10 minutes in X, Y and Z axes

11.2 Un-packaged Non-operating Free Fall

500mm drop height; 3 drops onto unit bottom face; IEC 60068-2-32.

11.3 Un-packaged Edge/Corner Drop

800mm drop height; 6 drops onto bottom face; IEC 60068-2-31.

800mm drop height; 3 drops onto each corner, 12 drops total; 3 drops onto each edge, 12 drops total; IEC 60068-2-31.

11.4 Electromagnetic Compatibility – Emissions

11.4.1 Radiated Emissions

CE (Europe):
The Product shall comply with EN300220 Short Range Devices for radiated emissions.

FCC (USA):
The Product shall comply with FCC Part 15 Subpart B and Subpart C requirements. The limit for this product shall be Class B of the FCC Part 15 Subpart B requirements. The equipment was passed the test performed according to FCC Part 15 Subpart B and Subpart C requirements.

GITEKI (Japan):
The product shall comply with GITEKI ARIB-STD-T108. The limit for this product shall be in accordance with MIC standard for specific radio equipment specified in Article 2, item 8.

NCC (Taiwan):
NCC certification is required. NCC requires an accredited laboratory to perform the testing. The limit for this product shall be Class B of LP0002. The equipment was passed the test performed according to LP0002 class B.

C-Tick (Australia):
C-Tick certification is required. The equipment was passed the test performed according to AS/NZS CISPR 32 Class B.

ETSI (Europe):
The product shall comply with EN300220. The limit for this product shall be Class B of EN300220. The requirement was passed the test performed according to EN300220 Class B.
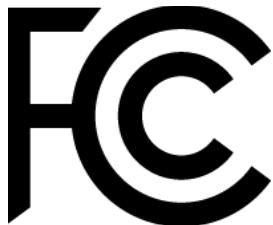
11.4.2   Electrostatic Discharge

CE (Europe):
The Product shall comply with EN55024: 2010. The test method used shall be EN61000-4-2. The test level to be used is ±4kV air discharge and ±2kV contact discharge.

11.5 Warning

11.5.1   Federal Communication Commission Interference Statement

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 of the following measures:
● Reorient or relocate the receiving antenna.
● Increase the separation between the equipment and receiver.
● Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
● Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

IMPORTANT NOTE:
FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance **20cm** between the radiator & your body.

11.5.2 CE

C E

This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

National Restrictions - This device is intended for home and office use in all EU countries (and other countries following the EU directive 2014/53/EC) without any limitation except for the countries mentioned below:

Country	Restriction	Reason/Remark
Bulgaria	None	General authorization required for outdoor use and public service
France	Indoor use limited to 10 mW e.i.r.p. within the band 865~868 MHz	Military Radiolocation use. Refarming of the 2.4 GHz band has been ongoing in recent years to allow current relaxed regulation. Full implementation planned 2012
Italy	None	If used outside of own premises, general authorization is required
Luxembourg	None	General authorization required for network and service supply(not for spectrum)
Norway	Implemented	This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund
Russian Federation	None	Only for indoor applications

Europe - EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 2014/53/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 2014/53/EC:

EN 300220, EN 301489-1/-17, EN 301489-1/-13, EN 62311 MPE, EN 60950-1 standard.

Declaration of Conformity (DoC)

This equipment may be operated in:

	AT	BE	BG	HR	CY	CZ	DK
	EE	FI	FR	DE	EL	HU	IE
	IT	LV	LT	LU	MT	NL	PL
	PT	RO	SK	SI	ES	SE	UK

Bulgarian Български	С настоящето, M2COMM декларира, че това безжично устройство е в съответствие със съществените изисквания и другите приложими разпоредби на Директива 2014/53/ЕC.
Czech Česky	Edge-Core tímto prohlašuje, že tento Electronic Shelf Labels, ESL je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 2014/53/ES.
Danish Dansk	Undertegnede M2COMM erklærer herved, at følgende udstyr Electronic Shelf Labels, ESL overholder de væsentlige krav og øvrige relevante krav i direktiv 2014/53/EF.
Dutch Nederlands	Hierbij verklaart M2COMM dat het toestel Electronic Shelf Labels, ESL in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 2014/53/EG. Bij deze Accton dat deze Electronic Shelf Labels, ESL voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 2014/53/EC.
English	Hereby, M2COMM, declares that this Electronic Shelf Labels, ESL is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EC.
Estonian Eesti	Käesolevaga kinnitab M2COMM seadme Electronic Shelf Labels, ESL vastavust direktiivi 2014/53/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
Finnish Suomi	Valmistaja M2COMM vakuuttaa täten että Electronic Shelf Labels, ESL tyyppinen laite on direktiivin 2014/53/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
French Français	Par la présente M2COMM déclare que l'appareil Electronic Shelf Labels, ESL est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53/CE.
German Deutsch	Hiermit erklärt M2COMM, dass sich dieser/diese/dieses Electronic Shelf Labels, ESL in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 2014/53/EG befindet". (BMWi) Hiermit erklärt M2COMM die Übereinstimmung des Gerätes Electronic Shelf Labels, ESL mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 2014/53/EG. (Wien)
Greek Ελληνική	με την παρουσα M2COMM δηλωνει οτι Electronic Shelf Labels, ESL συμμορφωνεται προς τις ουσιωδεις απαιτησεις και τις λοιπες σχετικες διαταξεις της οδηγιας 2014/53/εκ.
Hungarian Magyar	Alulírott, M2COMM nyilatkozom, hogy a Electronic Shelf Labels, ESL megfelel a vonatkozó alapvetõ követelményeknek és az 2014/53/EU irányelv egyéb elõírásainak.
Italian Italiano	Con la presente M2COMM dichiara che questo Electronic Shelf Labels, ESL è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53/CE.
Latvian Latviski	Ar šo M2COMM deklarē, ka Electronic Shelf Labels, ESL atbilst Direktīvas 2014/53/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lithuanian Lietuvių	Šiuo M2COMM deklaruoja, kad šis Electronic Shelf Labels, ESL atitinka esminius reikalavimus ir kitas 2014/53/EB Direktyvos nuostatas.
Maltese Malti	Hawnhekk, M2COMM, jiddikjara li dan Electronic Shelf Labels, ESL jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 2014/53/EC.

Polish Polski	Niniejszym M2COMM oświadcza, że Electronic Shelf Labels, ESL jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 2014/53/EC.
Portuguese Português	M2COMM declara que este Electronic Shelf Labels, ESL está conforme com os requisitos essenciais e outras disposições da Directiva 2014/53/CE.
Romanian Romană	M2COMM declară că acest dispozitiv fără fir respectă cerinţele esenţiale precum şi alte dispoziţii relevante ale Directivei 2014/53/EC.
Slovak Slovensky	M2COMM týmto vyhlasuje, že Electronic Shelf Labels, ESL spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 2014/53/ES.
Slovenian Slovensko	M2COMM izjavlja, da je ta Electronic Shelf Labels, ESL v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 2014/53/ES.
Spanish Español	Por medio de la presente M2COMM declara que el Electronic Shelf Labels, ESL cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 2014/53/CE.
Swedish Svenska	Härmed intygar M2COMM att denna Electronic Shelf Labels, ESL står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 2014/53/EG.
Swedish Svenska	Härmed intygar M2COMM att denna Electronic Shelf Labels, ESL står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 2014/53/EG.
Turkish Turk	M2COMM bu kablosuz cihazın temel gereksinimleri ve 2014/53/EU yonergesindeki ilgili koşulları karşıladığını beyan eder.

Notes:

The regulatory limits for maximum output power are specified in EIRP. The EIRP level (in dBm) of a device can be calculated by adding the gain of the Antenna used (specified in dBi) to the output power available at the connector (specified in dBm).

11.5.3 NCC 警語

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

12. *Part Numbers and Ordering Information*

The M2COMM ESL tag part numbering system is based upon tag size, color and country/region operating frequency, please refer to Section 2.1 for country/region radio channels; shown below are the part numbers available for the 2.9 inch tag.

Part Number	Frequency	Color	Remarks
ELSA-E			
PED29FN75RES9	915MHz	Black, White	Freezing Option
TBD	868MHz	Black, White	Freezing Option