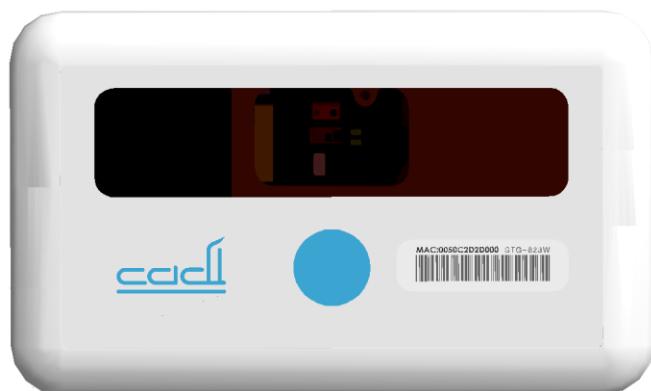


# CADI SmartSense

## SmartNODE

SMN-823W User Manual



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## Regulatory Information

### For customers in U.S.A and Canada

#### Federal Communications Commission (FCC) Statement

15.21

Warning:

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and 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.

This device complies with part 15 of the FCC Rules. 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.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. For body worn operation, this device has been tested and meets FCC RF exposure guidelines. When used with an accessory that contains metal may not ensure compliance with FCC RF exposure guidelines.

**For customers in Europe**

This equipment has been tested and found to comply with the limits set out in the R&TTE Directive.



Where you see this symbol on any of our electrical products or packaging in Europe, it means that at end of life the product or battery must be disposed of in accordance with any applicable laws or requirements for the separate disposal of electrical equipment or batteries.

**PRECAUTIONS**

- Keep batteries away from children.
- Do not swallow batteries.
- Do not throw batteries into water.
- Do not throw batteries into fire.
- Do not short-circuit batteries. Battery must be fit into tag in correct orientation.
- Do not replace battery with incorrect type. Incorrect type of battery replacement may cause risk of exposure.
- Battery should be dispose according to the instructions

**Product Information**

- Product model: SMN-823W
- Product name: SmartNODE
- Manufacturing site: 31 Ubi Road 1, #07-01A Aztech Building, Singapore 408694

**Version Information**

- This version is subject to change or upgrade without notice
- Version: A03
- Issue date: 20 Aug 2019

**Declaration**

Cadi Scientific Pte Ltd reserves the right to change the product described in this Operator's Manual. All information contained in this Operator's Manual is subject to change without notice.

**Warning:** Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.

**Warning:** Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the ME Equipment or ME System, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

<b>Manufacturer's declaration-electromagnetic emissions</b>		
The SMN-823W is intended for use in the electromagnetic environment (for Professional healthcare environments) specified below.		
The customer or the user of the SMN-823W should assure that it is used in such an environment.		
Emission test	Compliance	Electromagnetic environment-guidance (for Professional healthcare environments)
RF emissions CISPR 11	Group 1	The SMN-823W uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The SMN-823W is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Not applicable	
Voltage fluctuations /flicker emissions IEC 61000-3-3	Not applicable	

## 1. Introduction

The SMN-823W is a battery operated motion sensing tag. The SMN-823W transmits LF signal upon detection of motion to trigger close proximity communication to other tags. SMN-823W is designed to be installed onto automatic soap dispensers to allow Hand Hygiene Compliance in hospitals and clinics. When the SMN-823W detects motion, it will transmit a unique ID using low frequency. SMN-823W also has wifi to allow transmission of data to a server for monitoring of status, battery level, etc. The button on the SMN-823W allows for maintenance by the user.

## 2. Specifications

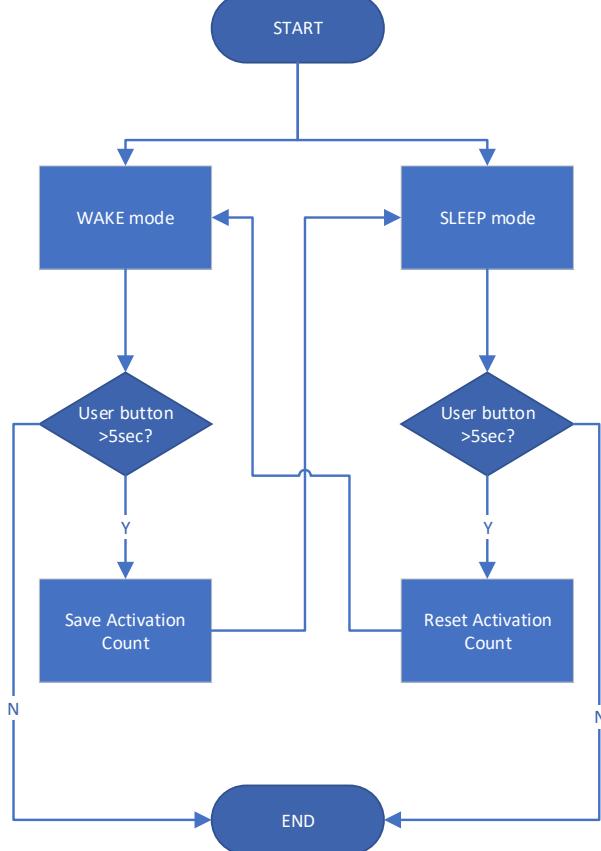
<b>1</b>	<b>Power</b>	Non-rechargeable Li-SOCl <sub>2</sub> battery 3.6v
<b>2</b>	<b>Dimensions</b>	100x60x11mm
<b>3</b>	<b>Weight</b>	80g
<b>4</b>	<b>Operating Temperature</b>	-10°C - 50°C
<b>5</b>	<b>Storage &amp; Transport temperature range</b>	0°C - 30°C
<b>6</b>	<b>RF (Transmit)</b>	Wifi 802.11 b/g/n
	<b>Frequency Band</b>	Ch1~Ch11 (2.412~2.462Ghz) (FCC) Ch1~Ch13 (2.412~2.472) (CE)
	<b>Transmission Rate</b>	10mins interval, or immediately upon change of location
	<b>Transmission power (ERP)</b>	32mW
<b>7</b>	<b>LF (Transmit and Receive)</b>	125 khz
	<b>Modulation</b>	ASK modulated
	<b>Transmission Rate</b>	Upon motion detection
<b>8</b>	<b>Interfaces</b>	1x button 2x LEDs
<b>9</b>	<b>Sensors</b>	Motion sensor Proximity sensor
<b>10</b>	<b>Compliance</b>	EN 300328 EN 300330 EN 301489 CISPR 32 EN60601-1-2 EN 62368 EN 62311 FCC Method-47 CFR Part 15 FCC 15 subpart B FCC part 2.1093

## 3. Button Usage

Action	Logic	Description
User button WAKE->SLEEP	Save Activation Count	Used to put the tag to sleep (off) state

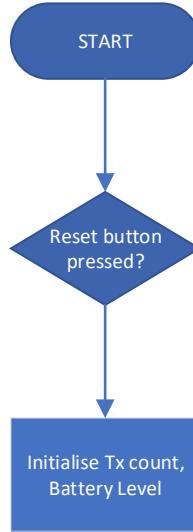
User button SLEEP->WAKE	Initialize Activation Count	Used to initialize the soap usage level to 0 when doing a soap refill
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Explanation: Activation Count (soap level) will be maintained until the user physically initiates a WAKE->SLEEP->WAKE sequence using the User button. Or else, the Activation Count remains.



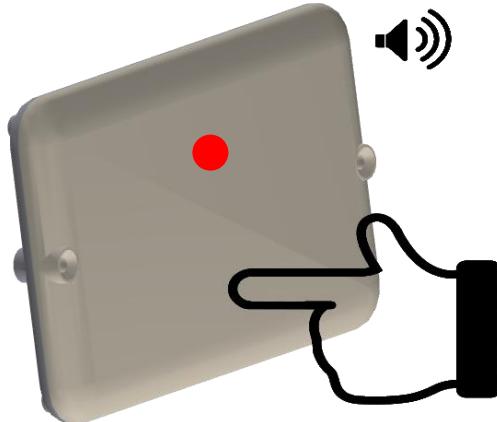
Action	Logic	Description
Reset button pressed	Initialize Tx count, Battery Level	Used to initialize parameters when a fresh battery is installed

Explanation: Reset button is only accessible when changing the battery. By changing the battery, followed by pressing the Reset button, the tag resets the Tx Count and Battery level.

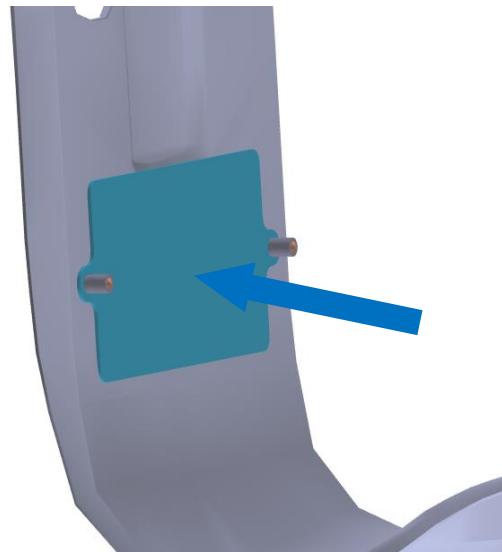


#### 4. First install on soap dispenser

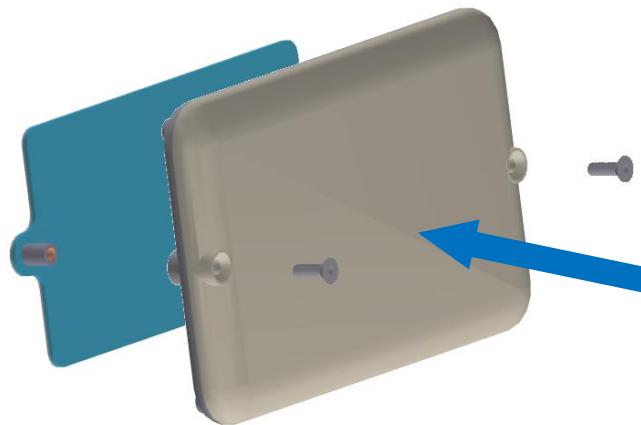
1. Ensure the tag is in SLEEP mode (no LED blinking). If not, long press (5sec) the User button. 3 beeps are heard, Red LED blinks once.



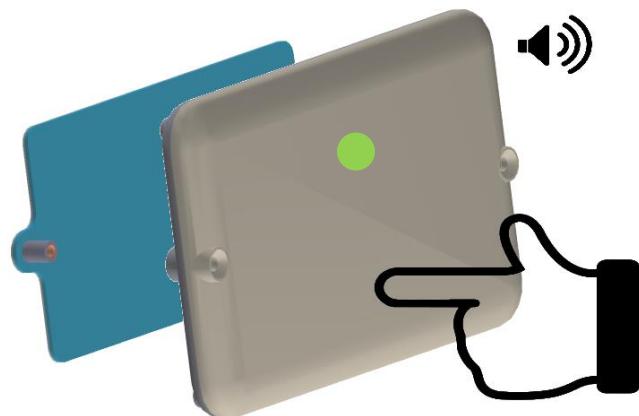
2. Install the bracket onto the soap dispenser using double-sided tape.



3. Install the tag onto the bracket.



4. Long press (5sec) the User button to WAKE the tag. 3 beeps are heard, Green LED blinks once, then starts blinking periodically.

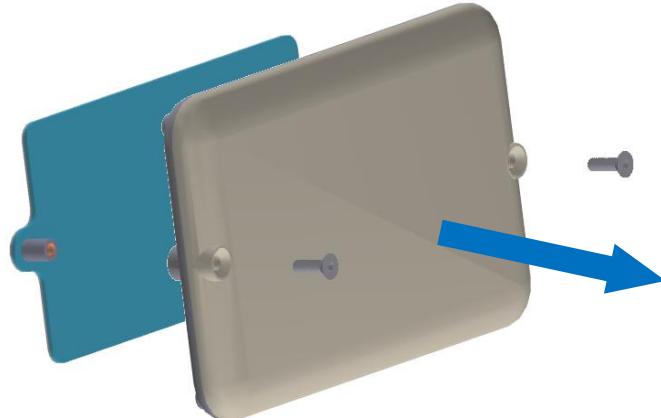


Result:

1. Usage level of the soap (Activation Count) will be reset to 0.

## 5. To change new battery

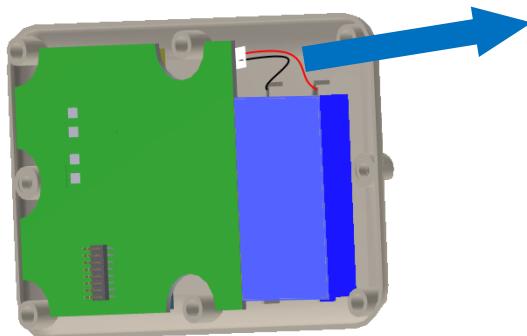
1. Remove the tag from the dispenser (2 screws).



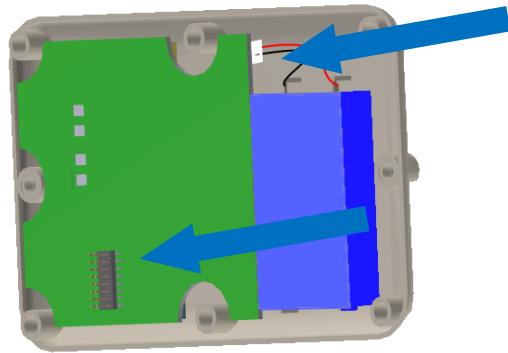
2. Unscrew the tag (6 screws) and remove the back cover.



3. Disconnect the existing battery.



4. Connect the new battery. Press the Reset button once (5 beeps are heard).



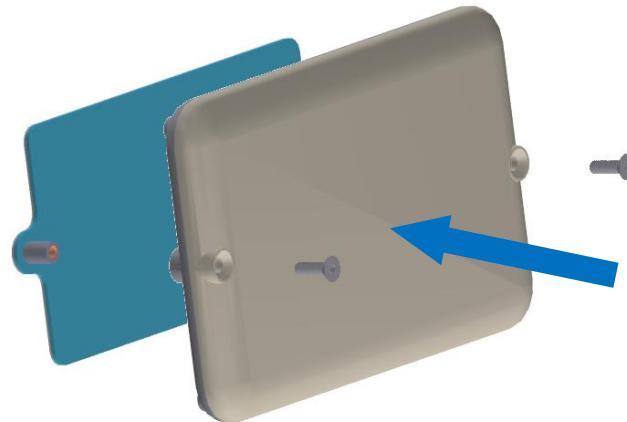
5. The tag will automatically default to WAKE mode. Confirm the tag is in WAKE mode by observing the blinking Green LED.



6. Replace the back cover and screw.



7. Install the tag back into the bracket.

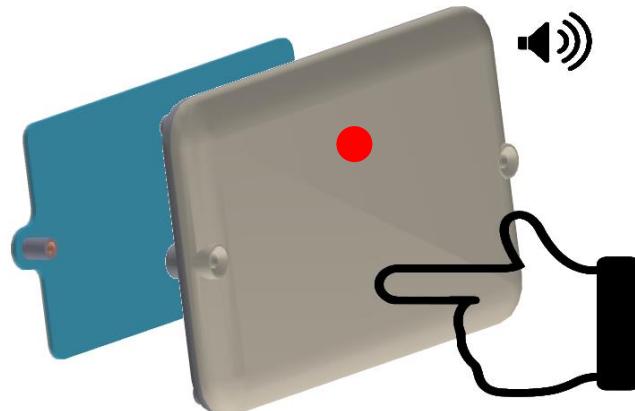


Result:

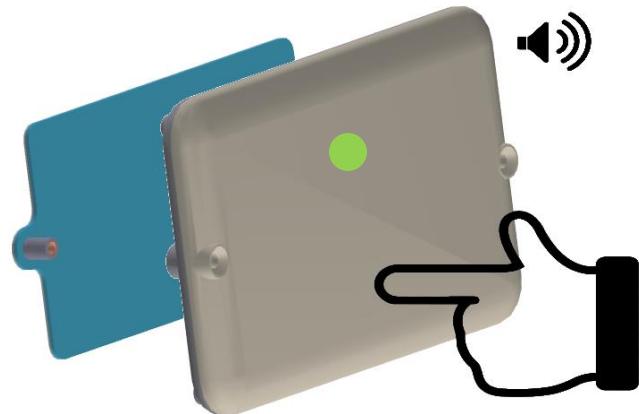
1. Usage level of the soap (Activation Count) will be maintained.
2. Transmit Count (wifi), and Battery Level will be reset.

## 6. To change new soap liquid

1. Put the tag to SLEEP mode (long press the User button until 3 beeps are heard, red LED blinks once).



2. Long press the User button to WAKE the tag (3 beeps are heard and Green LED starts blinking).

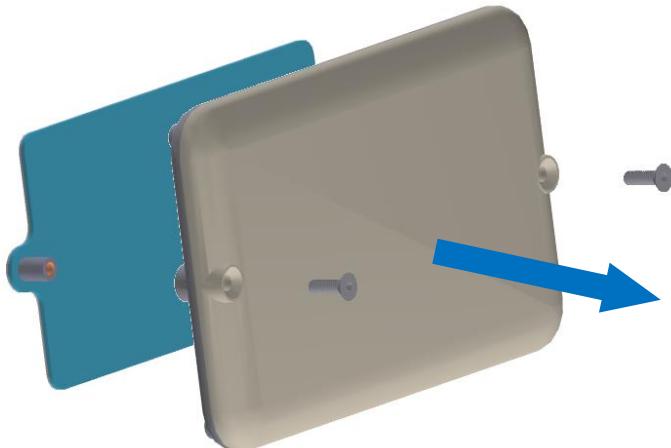


Result:

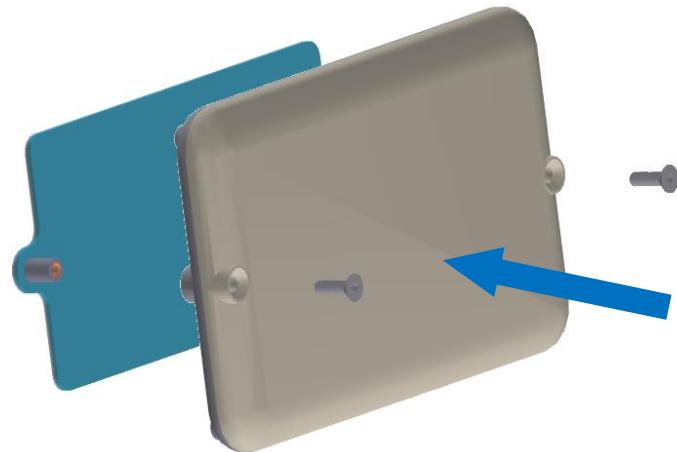
1. Usage level of the soap (Activation Count) will be reset to 0.

## 7. To remove tag for cleaning (no change of liquid soap)

1. Remove the tag from the dispenser for cleaning.



2. Install the tag back into the bracket.



Result:

1. All parameters will remain as no buttons are pressed.

## 8. Using the tag

The tag requires both vibration and proximity sensing to successfully activate. When mounted on the soap dispenser, when the staff puts his hand under the dispenser, the motor from the dispenser will activate the motion sensor, at the same time, the presence of the staff's hand will activate the proximity sensor. Once these 2 conditions are fulfilled, the SMN-823W will send a signal to trigger the staff tag of a successful hand wash event.



Vibration	Proximity	Hand wash
-	-	Unsuccessful
-	Yes	Unsuccessful
Yes	-	Unsuccessful
Yes	Yes	Successful

## 9. Low battery behavior

The tag continuously monitors the battery level. The battery capacity percentage is reported via wifi, and the low battery status can be viewed on the LED window. The LED will blink periodically in red instead of green. The tag will also report low battery status if it was internally restarted due to low battery. The tag will continue to transmit wifi its status until the battery dies completely.

Symptom	LED blink	Wifi battery capacity status	Wifi battery status	Explanation
Battery is good	Green	Normal range	Ok	Battery capacity is good, tag has not restarted due to low battery
Battery reaches end of life (<10% capacity)	Red	Low range	Low	Battery capacity is low
Tag has restarted >10 times	Red	Normal range	Low	Tag has restarted due to low battery

EMC compliance summary: When the Air +/- 15kV is applied, the EUT emits a "beep" four sounds, a red light flashes, and a red light flashes for one second.

SMN-823W is not a life support system and does not cause any harm to the patient or environment. A reset due to ESD will not affect essential performance and without basic safety consideration.