

**RF Exposure Report  
(mobile devices)  
47 CFR 2.1091  
RSS-102 Issue 6**

**Report No.:** WIRS135089 – FCC & ISSED RF Exposure

**Test Model:** NL4

**Received Date:** 05/13/2025

**Test Date(s):** 05/28/2025

**Issued Date:** June 12, 2025

**Applicant:** Next Meters Global, LLC

**Address:** 73 S Gateway Dr, Providence, UT 84332

**Issued By:** Eurofins Electrical and Electronic Testing NA, Inc.

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## 1. Certificate of Conformity

**Product:** Solar-Powered Gateway

**Brand:** NextCentury

**Test Model:** NL4

**Sample Status:** Pre-production

**Applicant:** Next Meters Global, LLC

**Test Date(s):** 05/28/2025

**Standard:** 47 CFR FCC Part 2.1091 and FCC Part 1.1310  
RSS-102 Issue 6



Chin Ming Lui  
Senior Wireless Test Engineer

**Engineering Statement:** The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 22 Subpart H and Part 24 Subpart E and Part 27 Subpart L of the FCC Rules under normal use and maintenance.



Brandon Quan  
Senior Wireless Test Engineer

## Report Status Sheet

| Revision | Report Date   | Reason for Revision        |
|----------|---------------|----------------------------|
| Ø        | May 30, 2025  | Initial Issue.             |
| 1        | June 12, 2025 | Model Name Updated to NL4. |

## 1. EUT General info

The NL4 is a solar-powered gateway. The EUT contains two radios: EFR32FG28 for ISM 900 and Nordic NRF52805 series chip for BLE.

The ISM 900 radio is configured to use frequency hopping spread spectrum (FHSS) with 50 equally spaced channels in the 902-928 MHz band.

The BLE radio is fed to a PCB trace antenna, which has a gain of -0.5dBi.

The ISM 900 and BLE radios cannot simultaneously transmit.

**Note:** The information in this section is supplied by Next Meters Global, LLC. Eurofins did not test or verify the antenna gains.

## 2. RF Exposure Limits

In this document, we evaluate the RF Exposure to human body due the intentional transmission from the transmitter (EUT). The limits for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 and RSS-102 issue 6 were followed.

### 2.1 FCC ID and IC

**FCC ID:** 2A8EC-NL4

**IC:** 28950-NL4

### 2.2 FCC Limits

According to FCC 1.1310 Table 1: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to Radio-Frequency (RF) radiation as specified in 1.1307(b)

Table 1 to § 1.1310(e)(1) – LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz)                                            | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (minutes) |
|------------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| <b>(A) Limits For Occupational / Control Exposures</b>           |                               |                               |                                     |                        |
| 0.3 – 3.0                                                        | 614                           | 1.63                          | *100                                | 6                      |
| 3.0 – 30                                                         | 1842/f                        | 4.89/f                        | *900/f <sup>2</sup>                 | 6                      |
| 30-300                                                           | 61.4                          | 0.163                         | 1.0                                 | 6                      |
| 300 - 1500                                                       | ...                           | ...                           | F/300                               | 6                      |
| 1500 - 100,000                                                   | ...                           | ...                           | 5                                   | 6                      |
| <b>(B) Limits For General Population / Uncontrolled Exposure</b> |                               |                               |                                     |                        |
| 0.3 – 1.34                                                       | 614                           | 1.63                          | *100                                | 30                     |
| 1.34 – 30                                                        | 824/f                         | 2.19/f                        | *180/f <sup>2</sup>                 | 30                     |
| 30 – 300                                                         | 27.5                          | 0.073                         | 0.2                                 | 30                     |
| 300 - 1500                                                       | ...                           | ...                           | F/1500                              | 30                     |
| 1500 - 100,000                                                   | ...                           | ...                           | 1.0                                 | 30                     |

F = Frequency in MHz

\* = plane wave equivalent density

## 2.3 Industry Canada Limits

According to RSS-102, Industry Canada has adopted the SAR and RF field strength limits established in Health Canada's RF exposure guideline, Safety Code 6.

| Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)                 |                    |                               |                         |                  |
|---------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------|-------------------------|------------------|
| Frequency Range                                                                                                     | Electric Field     | Magnetic Field                | Power Density           | Reference Period |
| (MHz)                                                                                                               | (V/m rms)          | (A/m rms)                     | (W/m <sup>2</sup> )     | (minutes)        |
| 0.003-10                                                                                                            | 83                 | 90                            | -                       | Instantaneous*   |
| 0.1-10                                                                                                              | -                  | $0.73/f$                      | -                       | 6**              |
| 1.1-10                                                                                                              | $87/f^{0.5}$       | -                             | -                       | 6**              |
| 10-20                                                                                                               | 27.46              | 0.0728                        | -2                      | 6                |
| 20-48                                                                                                               | $58.07/f^{0.25}$   | $0.1540/f^{0.25}$             | $8.944/f^{0.5}$         | 6                |
| 48-300                                                                                                              | 22.06              | 0.05852                       | 1.291                   | 6                |
| 300-6000                                                                                                            | $3.142 f^{0.3417}$ | $0.008335 f^{0.3417}$         | $0.02619 f^{0.6834}$    | 6                |
| 6000-15000                                                                                                          | 61.4               | 0.163                         | 10                      | 6                |
| 15000-150000                                                                                                        | 61.4               | 0.163                         | 10                      | $616000/f^{1.2}$ |
| 150000-300000                                                                                                       | $0.158 f^{0.5}$    | $4.21 \times 10^{-4} f^{0.5}$ | $6.67 \times 10^{-5} f$ | $616000/f^{1.2}$ |
| Note: $f$ is frequency in MHz.<br>* Based on nerve stimulation (NS).<br>** Based on specific absorption rate (SAR). |                    |                               |                         |                  |

### 3 Test Results (Mobile Configuration)

#### 3.1 Classification

Radio is installed inside a mobile host device. The antenna of the product, under normal use condition, is at least 20 cm away from the body of the user and accessible to the end user. Warning statement to the user for keeping at least 20 cm or more separation distance with the antenna should be included in user's manual.

#### 3.2 Maximum RF Power

##### BLE Radio:

| Modulation | Frequency Range (MHz) | Max. RF output power <sup>1</sup> (dBm) | Max. RF output Power with Tune Up <sup>2</sup> (dBm) | Max. Antenna Gain <sup>3</sup> (dBi) | Max. EIRP <sup>4</sup> (dBm) | Max. EIRP (mWatts) |
|------------|-----------------------|-----------------------------------------|------------------------------------------------------|--------------------------------------|------------------------------|--------------------|
| GFSK       | 2400 – 2483.5         | 0.31                                    | 1.31                                                 | -0.5                                 | 0.81                         | 1.205              |

<sup>1</sup>Note: Measured max conducted output power obtained from test report WIRS135089-FCC 15.247 (BLE)

<sup>2</sup>Note: Tune-up tolerance of +1 dB.

<sup>3</sup>Note: Max internal antenna gain obtained from “NL4 – Theory of Operation” by Next Meters Global, LLC.

The document is attached in Appendix A.

Antenna Information:

- Antenna Type: PCB Trace
- Max Gain: -0.5 dBi

<sup>4</sup>Note: Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

##### ISM 900 Radio:

| Modulation | Frequency Range (MHz) | Max. RF output power <sup>1</sup> (dBm) | Max. RF output Power with Tune Up <sup>2</sup> (dBm) | Max. Antenna Gain <sup>3</sup> (dBi) | Max. EIRP <sup>4</sup> (dBm) | Max. EIRP (mWatts) |
|------------|-----------------------|-----------------------------------------|------------------------------------------------------|--------------------------------------|------------------------------|--------------------|
| FHSS       | 902 – 928             | 29.51                                   | 30.51                                                | 2.20                                 | 32.71                        | 1866.4             |

<sup>1</sup>Note: Measured max conducted output power obtained from test report WIRS135089-FCC 15.247 (FHSS Radio)

<sup>2</sup>Note: Tune-up tolerance of +1 dB.

<sup>3</sup>Note: Max peak gain obtained from “Taoglas TG.33.8H11W Datasheet”. The document is attached in Appendix A.

Antenna Information:

- Part No: TG.33.8H11W
- Antenna Type: Dipole
- Max Peak Gain: 2.20 dBi for 824-960MHz

<sup>4</sup>Note: Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

### 3.3 RF Exposure Calculation

#### FCC limits

Calculations for this report are based on measured maximum conducted output power

#### BLE Radio:

| Modulation | Frequency Range (MHz) | Max. EIRP <sup>1</sup> (dBm) | Max. EIRP (mW) | Power Density (mW/cm <sup>2</sup> ) @20 cm | FCC Limit (mW/cm <sup>2</sup> ) | Results  |
|------------|-----------------------|------------------------------|----------------|--------------------------------------------|---------------------------------|----------|
| GFSK       | 2400 – 2483.5         | 0.81                         | 1.205          | 0.00024                                    | 1.0                             | Complies |

<sup>1</sup>Note: Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

#### ISM 900 Radio:

| Modulation | Frequency Range (MHz) | Max. EIRP <sup>1</sup> (dBm) | Max. EIRP (mW) | Power Density (mW/cm <sup>2</sup> ) @20 cm | FCC Limit (mW/cm <sup>2</sup> ) | Results  |
|------------|-----------------------|------------------------------|----------------|--------------------------------------------|---------------------------------|----------|
| FHSS       | 900 – 928             | 32.71                        | 1866.4         | 0.371                                      | 0.601                           | Complies |

<sup>1</sup>Note: Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

## ISED Limits

Calculations for this report are based on measured maximum conducted output power

### BLE Radio:

| Modulation | Frequency Range (MHz) | Max. EIRP <sup>1</sup> (dBm) | Max. EIRP (mW) | Power Density (W/m <sup>2</sup> ) @20 cm | RSS Limit (W/m <sup>2</sup> ) | Results  |
|------------|-----------------------|------------------------------|----------------|------------------------------------------|-------------------------------|----------|
| GFSK       | 2400 – 2483.5         | 0.81                         | 1.205          | 0.0024                                   | 5.348                         | Complies |

<sup>1</sup>Note: Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

### ISM 900 Radio:

| Modulation | Frequency Range (MHz) | Max. EIRP <sup>1</sup> (dBm) | Max. EIRP (mW) | Power Density (W/m <sup>2</sup> ) @20 cm | RSS Limit (W/m <sup>2</sup> ) | Results         |
|------------|-----------------------|------------------------------|----------------|------------------------------------------|-------------------------------|-----------------|
| FHSS       | 900 – 928             | 32.71                        | 1866.4         | 3.713                                    | 2.740                         | Does not Comply |

<sup>1</sup>Note: Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

The ISM 900 radio of the EUT does not comply with RF Exposure requirements at 20cm away from the body of the user. Therefore, the distance away from the body of the user will need to be increased.

| Modulation | Frequency Range (MHz) | Max. EIRP <sup>1</sup> (dBm) | Max. EIRP (mW) | Power Density (W/m <sup>2</sup> ) @24 cm | RSS Limit (W/m <sup>2</sup> ) | Results  |
|------------|-----------------------|------------------------------|----------------|------------------------------------------|-------------------------------|----------|
| FHSS       | 900 – 928             | 32.71                        | 1866.4         | 2.579                                    | 2.740                         | Complies |

<sup>1</sup>Note: Max. EIRP (dBm) = Max RF Output Power with Tune Up (dBm) + Max Antenna Gain (dBi)

With increased distance from the body of the user at 24cm, the ISM 900 radio of the EUT complies with RF Exposure requirements.

## Power Density Calculation

$$P_d = (P_{out} * G) / (4 * \pi * R^2)$$

Where:

$P_d$  = Power density in W/m<sup>2</sup>

$P_{out}$  = Output power from the antenna in watts (W)

G = Gain of the antenna in linear scale

R = Distance between observation point and center of the radiator in meters (m)

## 4 Conclusion

This device is compliant with RF Exposure requirements of the limits for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 and RSS-102 Issue 6 for General Public (Uncontrolled Environment).

The BLE radio complies to both the FCC and ISED limits at 20cm away from the body of the user.

The ISM 900 radio complies to the FCC limit, but fails the ISED limit at 20cm away from the body of the user. The ISM 900 complies to the ISED limit at 24cm away from the user.

The BLE and ISM 900 radios cannot transmit simultaneously.

In conclusion, the EUT, under normal use condition, must be at least 24 cm away from the body of the user and accessible to the end user. Warning statement to the user for keeping at least 24 cm or more separation distance with the antenna should be included in user's manual.

## Appendix A

### **Antenna Information:**

BLE:

See NL4 – Theory of Operation

ISM 900:



TG.33.8H11W.pdf

### **Theory of Operation:**



NL4 - Theory of  
Operation.pdf