

RE051-19-105023-1-A Ed. 0

MPE test report

According to the standard:
CFR 47 FCC PART 15

Equipment under test:
Wirnet iStation 915

FCC ID: 2AFYS-KLKWIS915

Company:
KERLINK

Distribution: Mr LOUVEAU

(Company: KERLINK)

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|-----|-----------|------------------|---|------|
| | | | Name and Function | Visa |
| 0 | 24-Jan-20 | Creation | T. LEDRESSEUR, Radio Technician | |

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DESIGNATION OF PRODUCT: Wirnet iStation 915

Serial number (S/N): 1980018353

Reference / model (P/N): Wirnet iStation 915

Software version: V4.2.1
Test software: libloragw-utils_5.0.1-klk10

MANUFACTURER: KERLINK

COMPANY SUBMITTING THE PRODUCT:

Company: KERLINK

Address: 1 Rue Jacqueline Auriol
35235 THORIGNE-FOUILLARD
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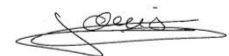
Responsible: Mr LOUVEAU

DATES OF TEST: From 15-Jan-20 to 24-Jan-20

TESTING LOCATION: EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE
FCC Accredited under US-EU MRA Designation Number: FR0009
Test Firm Registration Number: 873677

TESTED BY: S. LOUIS

VISA:



WRITTEN BY: S. LOUIS

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1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: Wirnet iStation 915, in accordance with normative reference.

The device under test integrates the followings radio function:

- GPS receiver
- 3G/LTE module already certified (FCC ID: XMR201903EG25G)
- LoRa function

2. PRODUCT DESCRIPTION

Frequencies plan detailed (LoRaWAN standard)

Transmitter

| Channel frequencies | LoRa bandwidth (kHz) | Number of channel | Channel width (kHz) | SPREAD FACTOR |
|--------------------------|----------------------|-------------------|---------------------|---------------|
| 923,3+i*0.6MHz (i=0 à 7) | 500 | 8 | 600 | 7 to 12 |

Receiver

| Channel frequencies | LoRa bandwidth (kHz) | Number of channel | Channel width (kHz) | SPREAD FACTOR |
|----------------------------|----------------------|-------------------|---------------------|---------------|
| 902,3+i*0,2MHz (i= 0 à 63) | 125 | 64 | 200 | 7 to 10 |
| 903,0+i*1.6MHz (i=0 à 7) | 500 | 8 | 600 | 7 to 12 |

| | |
|------------------------|---|
| Class: | B |
| Utilization: | Residential use |
| Antenna type and gain: | Internal antenna: 2.6 dBi External antennas: 3 dBi or 6dBi |
| Power source: | AC/DC PoE |

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

3. *NORMATIVE REFERENCE*

The standards and testing methods related throughout this report are those listed below. They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

| | |
|---|---|
| CFR 47 FCC Part 15 (2020) | Radio Frequency Devices |
| ANSI C63.10 | 2013 Procedures for Compliance Testing of Unlicensed Wireless Devices. |
| 447498 D01 General RF Exposure Guidance v06 | RF Exposure procedures and equipment authorization policies for mobile and portable equipment |
| OET BULLETIN 65 | Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields |

4. RF EXPOSURE**Calculus for LoRa in standalone**

RF EXPOSURE: The analyze is realized only with the worst critical antenna 6 dBi

Maximum measured power = 27.46 dBm at 923.3 MHz

With a gain of 6dBi

EIRP = 33.46 dBm = 2.2182 W

The maximum duty cycle is 40% on the reference period of 6min, so the power computed is: 887.28mW

In accordance with KDB 447498 D01 General RF Exposure Guidance v06:

$$PSD = EIRP / (4 * \pi * R^2)$$

$$\Rightarrow 887.28 / (4 * \pi * (20 \text{ cm})^2) = 0.176 \text{ mW/m}^2 \text{ (limit=0.6155 mW/cm}^2)$$

The MPE ratio is then calculated for the simultaneous transmission.

$$MPE \text{ ratio(LoRa)} = \frac{PSD}{PSD \text{ lim}} = 0.286$$

The equipment fulfils the requirements on power density for general population/uncontrolled exposure and therefore fulfils the requirements of 47 CFR §1.1310.

Calculus for EG25-G in standalone

The results are extracted from **EG25-G Module** RF Exposure evaluation report referenced **HR/2019/1001602** and calculated with the antenna used (see appendix 1).

| Operating Band | Frequency Band (MHz) | Frequency (MHz) | Conducted Power (dBm) | Conducted Power (W) | Gain (dBi) | Average EIRP (mW) | Power density at 20 cm (mW/cm ²) | Limit (mW/cm ²) | MPE ratio |
|----------------|----------------------|-----------------|-----------------------|---------------------|------------|-------------------|--|-----------------------------|-----------|
| GSM 850 | 824-849 | 824.2 | 25.81 | 0.381 | -0.7 | 324.3 | 0.064 | 0.55 | 0.116 |
| GSM 1900 | 1850-1910 | 1850.2 | 22.81 | 0.191 | 5.4 | 662.2 | 0.132 | 1 | 0.132 |
| WCDMA B2 | 1850-1910 | 1852.4 | 25.00 | 0.316 | 5.4 | 1096.5 | 0.218 | 1 | 0.218 |
| WCDMA B4 | 1710-1755 | 1712.4 | 25.00 | 0.316 | 5.0 | 1000 | 0.199 | 1 | 0.199 |
| WCDMA B5 | 824-849 | 826.4 | 25.00 | 0.316 | -0.7 | 269.2 | 0.054 | 0.55 | 0.098 |
| LTE B2 | 1850-1910 | 1850.7 | 25.00 | 0.316 | 5.4 | 1096.5 | 0.218 | 1 | 0.218 |
| LTE B4 | 1710-1755 | 1710.7 | 25.00 | 0.316 | 5.0 | 1000 | 0.199 | 1 | 0.199 |
| LTE B5 | 824-849 | 824.70 | 25.00 | 0.316 | -0.7 | 269.2 | 0.054 | 0.55 | 0.098 |
| LTE B7 | 2500-2570 | 2502.50 | 25.00 | 0.316 | 6.3 | 1349 | 0.268 | 1 | 0.268 |
| LTE B12 | 699-716 | 699.70 | 25.00 | 0.316 | -0.7 | 269.2 | 0.054 | 0.47 | 0.115 |
| LTE B13 | 777-787 | 779.50 | 25.00 | 0.316 | -0.7 | 269.2 | 0.054 | 0.52 | 0.104 |
| LTE B25 | 1850-1915 | 1850.7 | 25.00 | 0.316 | 5.4 | 1096.5 | 0.218 | 1 | 0.218 |
| LTE B26 | 814-824 | 814.7 | 25.00 | 0.316 | -0.7 | 269.2 | 0.054 | 0.54 | 0.100 |
| LTE B26 | 824-849 | 824.7 | 25.00 | 0.316 | -0.7 | 269.2 | 0.054 | 0.55 | 0.098 |

Calculus for simultaneous transmission

Only the worst critical case for the WAN module is taken into account for this analysis

$$\sum \text{ of MPE ratio} = \text{MPE ratio (LoRa)} + \text{MPE ratio (LTE}_{B7}) = 0.286 + 0.268 = 0.554 \leq 1.0$$

The product meet the requirement for Simultaneous transmission MPE test exclusion from §7.2 of KDB 447498

□□□ End of report, 1 appendix to be forwarded □□□

APPENDIX 1: Internal antenna gain

