



# RF EXPOSURE REPORT

Report No.: 20230517G05337X-W4

Product Name: LoRa Controller

UC501-915M, NC501-915M, UC501-9M, NC501-9M, UC502-915M,

Model No.: NC502-915M, UC502-9M, NC502-9M

FCC ID: 2AYHY-UC50XV3

**Applicant:** Xiamen Milesight IoT Co., Ltd.

Building C09, Software Park Phase III, Xiamen 361024, Fujian, Address:

China

**Dates of Testing:** 05/29/2023 - 06/14/2023

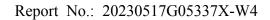
**Issued by:** CCIC Southern Testing Co., Ltd.

Electronic Testing Building, No. 43 Shahe Road, Xili Street,

Lab Location: Nanshan District, Shenzhen, Guangdong, China.

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## **Test Report**

Product.....: LoRa Controller

Brand Name....: Milesight

Trade Name .....: Milesight

Applicant.....: Xiamen Milesight IoT Co., Ltd.

Applicant Address...... Building C09, Software Park Phase III, Xiamen 361024,

Fujian, China

Manufacturer.....: Xiamen Milesight IoT Co., Ltd.

Manufacturer Address......: Building C09, Software Park Phase III, Xiamen 361024,

Fujian, China

Test Standards...... 47 CFR Part 2.1091

Test Result.....: Pass

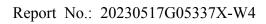
Chuiwang Zhang, Test Engineer

**Reviewed by.....** 2023.06.19

Chris You, Senior Engineer

**Approved by.....**: 2023.06.19

Yang Fan, Manager



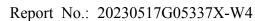


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Change History				
Issue Date Reason for change				
1.0	First edition			





## 1. GENERAL INFORMATION

## 1.1. EUT Description

Product Name	LoRa Controller		
Device Type	Fixed devices		
Frequency Range	LoRaWAN: 902MHz~928MHz		
Modulation Type	LoRa		
	Internal Antenna		
Antenna Type	External Antenna 1		
	External Antenna 2		
	Internal Antenna: 2.82dBi (Reference Antenna Report)		
Antenna Gain	External Antenna 1: 1.0dBi (Reference Antenna Report)		
	External Antenna 2: 5.06dbi (Reference Antenna Report)		

Note 1: Model:UC501-915M, NC501-915M, UC501-9M, NC501-9M, UC502-915M, NC502-915M, UC502-9M, NC502-9M have the same software, PCB board, electromagnetic emissions and electromagnetic compatibility characteristics. The only difference between the models is that some function devices paste or not paste. The below table show differences:

Model	PN	External LoRa antenna	Power Support	Other differences	
UC501-915M, NC501-915M, UC501-9M, NC501-9M	×	×	Solar powered(6V, 1.7W) + 2*2550mAh	Model	
UC501-915M, NC501-915M, UC501-9M, NC501-9M	EA	V	Chargeable battery + 5~24 V <sub>DC</sub>	Name	
UC502-915M, NC502-915M, UC502-9M, NC502-9M	×	×	3*9000mAh Replaceable Li-SoCl <sub>2</sub> battery +	Model	
UC502-915M, NC502-915M, UC502-9M, NC502-9M	EA	V	5~24V <sub>DC</sub>	Name	
Note: √: Paste: ×: Not paste: EA: External Antenna.					

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## 1.2. EUT Description

EUT has been tested according to the following standards.

No.	Identity	Document Title		
1	47 CFR Part 1	Practice and Procedure		
2	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General		
2	4/ CFR Part 2	Rules and Regulations		
2	KDB 447498 D01 General	RF Exposure Procedures and Equipment Authorization		
RF Exposure Guidance v06		Policies for Mobile and Portable Devices		
4	OET Bulletin 65	Evaluating Compliance with FCC Guidelines for Human		
4	Edition 97-01	Exposure to Radiofrequency Electromagnetic Fields		

## 1.3. Laboratory Facilities

FCC-Registration No.: 406086

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until April 19th, 2023.

**ISED Registration: 11185A-1** 

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Jun. 30th, 2023.

**A2LA Code: 5721.01** 

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

### 1.4. Laboratory Location

Company Name:	CCIC Southern Testing Co., Ltd.
Address:	Electronic Testing Building, No. 43 Shahe Road, Xili Street, Nanshan
Address.	District, Shenzhen, Guangdong, China



## 2. Technical Requirements Specification in CFR Title 47 Part 2.1091

#### 2.1. Evaluation method

The criteria listed in the following table shall be used to evaluate the environment 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/cm2)	Averaging Time (minutes)	
	(i) Limits for	Occupational/Control	lled Exposure		
0.3-3.0	614	1.63	*(100)	< 6	
3.0-30	1824/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	
	(ii) Limits for General Population/Uncontrolled Exposure				
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	
Note: f = frequency in MHz. * = Plane-wave equivalent power density.					

## 2.2. Predication of MPE limit at a given distance

Refer to formulas on page 19 of OET Bulletin 65, Edition 97-01.

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mW)

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna (appropriate units, e.g., cm)



## 2.3. Evaluation Results

### Worst-Case mode Conducted Output Power Results for LoRa

Operation	Frequency	Maximum Output power	Max Tune up power	Max Tune up power
Mode	(MHz)	(dBm)	(dBm)	(mW)
LoRa-DTS	903.0	10.696	10±1	12.59
LoRa-DSS	920.3	10.680	10±1	12.59

#### Calculation results: Worst-Case mode

Operation	Antenna Gain	Antenna Gain	Distance	Result	Power Density
Mode	(dBi)	(numeric)	(cm)	(mW/cm2)	(mW/cm2)
LoRa-DTS	5.06	2.84	20	0.005	0.60
LoRa-DSS	5.06	2.84	20	0.005	0.60

## 2.4. Conclusion

According to the KDB 447498 D01 General RF Exposure Guidance v06 section 7.2 determine the device is exclusion from SAR test.

\*\* END OF REPORT \*\*