

FCC MPE calculation Report



The RvA is signatory to ILAC - MRA



Product name : 4Suites Cloud B.V.
Applicant : Fullcloud controller
FCC ID : 2A225-FC2922
IC ID : 29825-FC2922

Test report No. : P000270309 003 Ver 2.0

Laboratory information

Accreditation

Kiwa Nederland B.V. complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:2017. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L248 and is granted by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie).

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The Industry Canada company number for Kiwa Nederland B.V. is: 4173A. The CABID is NL0001.

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Documentation

The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 10 years at Kiwa Nederland B.V.

Testing Location

Test Site	Kiwa Nederland B.V.
Test Site location	Wilmersdorf 50 7327 AC Apeldoorn The Netherlands Tel. +31 88998 3393
Test Site FCC	NL0001
CABID	NL0001

Revision History

Version	Date	Remarks	By
v0.50	13/03/2023	First draft	MK
v1.00	20-04-2023	Final release	PvW
v2.0	02/06/2023	Name update	MK

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1 General Description

1.1 Applicant

Client name:	4Suites Cloud B.V.
Address:	Laan van de Maagd 103, Apeldoorn, Netherlands
Zip code:	7324 BT
Telephone:	--
E-mail:	marijn@pinvaccess.com
Contact name:	Mr. Marijn Achterkamp

1.2 Manufacturer

Manufacturer name:	4Suites Cloud B.V.
Address:	Laan van de Maagd 103, Apeldoorn, Netherlands
Zip code:	7324 BT
Telephone:	--
E-mail:	marijn@pinvaccess.com
Contact name:	Mr. Marijn Achterkamp

1.3 Tested Equipment Under Test (EUT)

Product name:	FullCloud Controller
Brand name:	4Suites Cloud B.V.
FCC ID:	2A225-FC2922
IC:	29825-FC2922
Product type:	IOT Cloud Controller
Model(s):	--
Batch and/or serial No.	--
Software version:	--
Hardware version:	--
Date of receipt	25/01/2023
Tests started:	06/02/2023
Testing ended:	10/02/2023

Auxiliary items

AUX1

Product name:	NFC tag
Brand name:	--
Product type:	--
Model(s):	--
Batch and/or serial No.	--
Remarks:	Connects to EUT

1.4 Conclusions

The sample of the product showed **NO NON-COMPLIANCES** to the RF exposure requirement.

The results of the test as stated in this report, are exclusively applicable to the product items as identified in this report. Kiwa Netherlands accepts no responsibility for any properties of product items in this test report, which are not supported by 47 CFR §1.1310

Assessment is performed by:

Name : Maaz Harris Khan, BEng under supervision of Paul van Wanrooij, BASc

Review of test methods and report by:

Name : ing. P.A. Suringa

The above conclusions have been verified by the following signatory:

Date : 15-06-2023

Name : Koray Korcum, MSc

Signature :

A handwritten signature in blue ink, appearing to read "K. Korcum", enclosed within a blue circular stamp.

2 SAR Measurement Evaluation

2.1.1 Maximum Output Power

The maximum radiated power including antenna gain is shown as below.

Technology	Conducted Output power	Radiated output power
BLE	*2.3 dBm	2.8 dBm
915 Proprietary	*10.72 dBm	8.12 dBm
NFC	--	*42.9 dB μ V/m @30m

* from Kiwa Netherlands B.V. test report no: P000270309 002 Ver1.0

2.1.2 MPE Limits

Limits for occupational/controlled exposure

Frequency Range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
0.3 – 3.0	614	1.63	100 (see note 1)	≤6
3.0 – 30	1842/f	4.89/f	900/f ² (see note 1)	≤6
30 – 300	61.4	0.163	1.0	≤6
300 – 1500	--	--	f/300	≤6
1500 – 100000	--	--	5	≤6

Limits for general population/uncontrolled exposure

Frequency Range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
0.3 – 1.34	614	1.63	100 (see note 1)	≤30
1.34 – 30	824/f	2.19/f	180/f ² (see note 1)	≤30
30 – 300	27.5	0.073	0.2	≤30
300 – 1500	--	--	f/1500	≤30
1500 – 100000	--	--	1.0	≤30

Notes :

f = frequency in MHz

1: plane wave equivalent power density

2.1.3 MPE calculation

Based on expected use of the device, the EUT is used in a fixed application, at least 5 cm from any body part of the user or nearby persons.

Calculation method of RF Safety Distance:

$$PD = \frac{P_{out} * G}{4\pi r^2} = \frac{P(eirp)}{4\pi r^2}$$

Where:

PD = Power Density in mW/cm^2

Pout = Output power in mW

G = Gain of antenna

R = Distance between observation point and centre of the radiator in cm

Calculation results

Technology	Frequency (MHz)	Max radiated power (mW)	Distance (cm)	Power density (mW/cm^2)	Limit (mW/cm^2)
BLE	2480	1.9	5	0.006	1.0
915 Proprietary	902.6	6.5	5	0.02	0.6

Technology	Frequency (MHz)	Max field strength (dBμV/m @30m)	Distance (cm)	Field strength	Limit
NFC	13.56	42.9	5	1.4 V/m @ 5cm	60.7 (V/m)

$$42.9 \text{ dB}\mu\frac{V}{m} = 139.6 \mu\frac{V}{m} @ 30m = 0.00014 \frac{V}{m} @ 30m$$

Assuming isotropic radiation and far field behaviour the field strength at 5 cm can be calculated by calculating the ratio of the surface area of spheres with $r=30m$ and $r=0.05m$. This ratio is multiplied by the field strength at 30m to find the field strength at 5 cm.

$$\frac{30^2}{0.05^2} = 360182$$

$$360182 * 0.00014 = 50.4 \frac{V}{m} @ 5 \text{ cm instantaneous}$$

Assuming 10 second exposure in any 6 minute interval:

$$50.4 * \left(\frac{10}{360}\right) = 1.4 \frac{V}{m} \text{ time averaged field strength}$$

2.2 Summary

Since MPE calculation are below the limit SAR testing is not required.