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File Number **24/36405325**

TECHNICAL REPORT
Human exposure

Petitioner's Reference:	Lock Up Smart Doors S.L.		
Company Address:	Escritor Jeronimo Tristante, N10, 3B. 30100- Murcia – Spain.		
Represented by:	Juan Jesús Pinuaga Cascales		
PMN:	Access controller - Lock up smart door		
Brand:	OPERTO	HMN:	OC1-EXT
Sample #1:	45013	Applus Id:	22053-002
Result:	**complies**		
It has been tested and complies with the applicable standard. See test result summary section.			
Applicable Standard:			
EMF standard/s:	**FCC 47 CFR Part 2 Subpart J[1]** **RSS-102 Issue 5**		
[1]The latest modifications of the standard, published at the date of the tests reported in this document, have been considered.			
Dates and Test Site:	Applus Barcelona, Bellaterra		
Equipment Reception Date	March 7, 2024		

Test Manager: Javier Miguel Nadales Lisbona
Date of issue: Bellaterra, December 12, 2024

JORGE GEIS ESTRADA

Firmado digitalmente por JORGE GEIS ESTRADA
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EMC & Wireless Technical Manager
Electrical and Electronics
LGAI Technological Center S.A.

ENSAYO ISO 17025 Nº9 / LE894

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1 INDEX

2.1 EQUIPMENT DESCRIPTION

This information has been provided by the customer and it is not covered by the accreditation. LGAI does not assume any responsibility from it.

EQUIPMENT DESCRIPTION			
Description	The device is WiFi and BLE access system controller used to interact with a variety of access systems as can be common doors, entrance doors, electrical strikes, parking barriers, and elevators among others.		
EUT Version	**FVIN**	**HVIN**	
	7.6.2	LockUpAIR_V4	
Power supply	+/-	12 V	-- Hz
Equipment Size	**Length**	**Width**	**Height**
	80 mm	80 mm	30 mm
Modulation	GFSK		
Operating Frequency Band	2400MHz - 2483.5 MHz		
Maximum RF Output Power [dBm]	5		
Operating Channel(s) Width(s) [MHz]	1		
Equipment Type	DTS		
Number of Hopping Channels	N/A		
Emission Designator	1M1G1D		
FCC ID			

Table 1: Equipment description

RF FEATURES					
Description	**Communication Technology**	**Radio Chipset**	**Brand**	**Module Model**	**Antenna Gain [dBi]**
	Bluetooth	CC2640	TI	Not provided	3.3

Table 2: RF Features

2.2 TEST CONFIGURATION

DUT Operation Modes	
Mode #	**Description**
1	The customer provides instructions for setting up the sample in test mode with continuously modulated transmission operating on a single channel through the RF Smart Studio software.

Table 3. Test Configuration

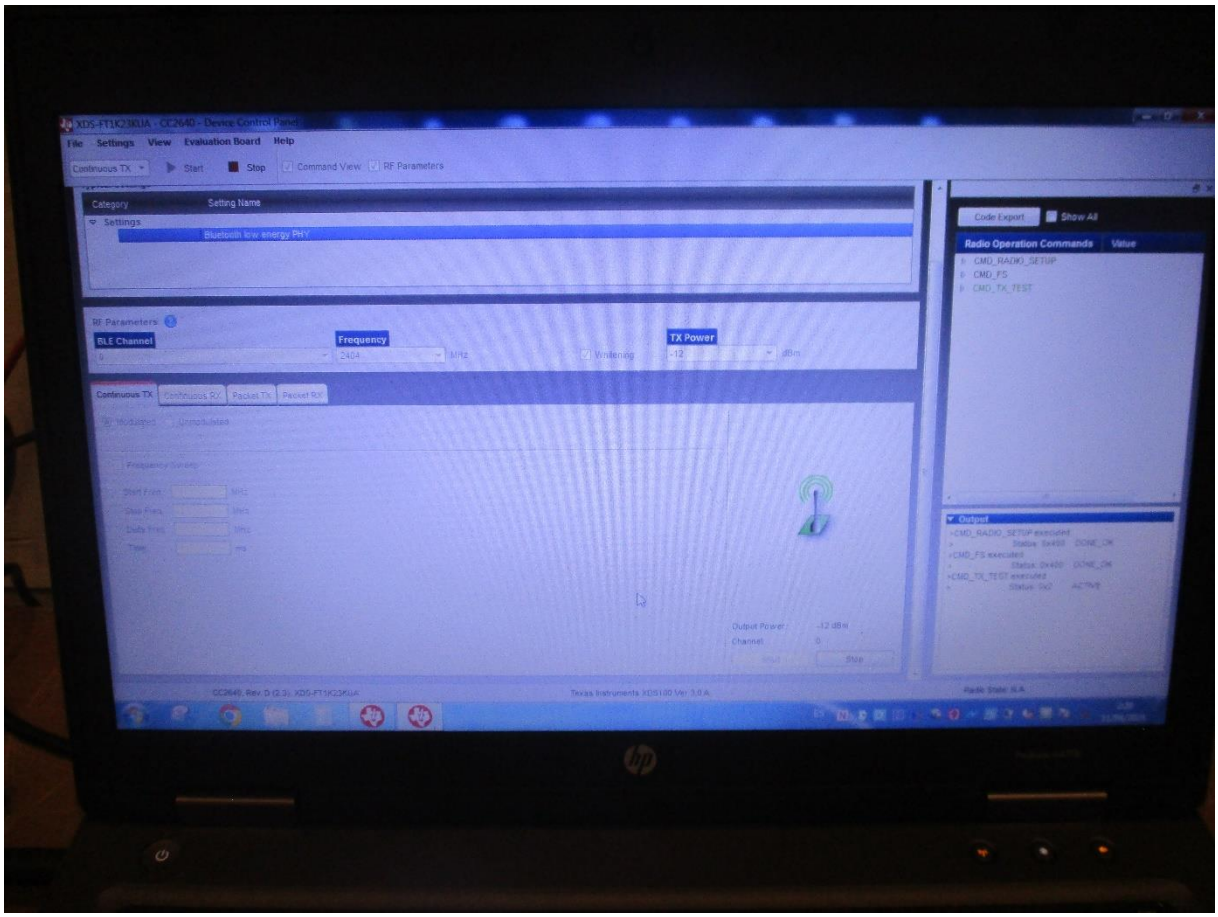

Fig. 1: – Sample Configuration

2.3 PHOTOGRAPHS

Photographs identifying the equipment under test and its auxiliaries, as well as assembly photographs for radiated and conducted tests, can be found in the document: *24/36405327*

2.4 TEST FACILITIES ID

TEST FACILITIES ID	
FCC Test Firm Registration Number:	507478
ISED Assigned Code:	5766A
CABID	ES0001

Table 4: Test facilities ID

2.5 COMPETENCES AND GUARANTEES

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3 TEST RESULTS

3.1 HUMAN EXPOSURES STANDARDS

3.1.1 Test Parameters

According to the standard FCC 47 CFR Part 2 Subpart J KDB 447498 D01.

3.1.1.1 Requirements

For operations within the frequency range of 300 kHz and 6 GHz (inclusive), the limits for maximum permissible exposure (MPE), derived from whole-body SAR limits and listed in Table 1 in paragraph (e)(1) of this section, may be used instead of whole-body SAR limits as set forth in paragraphs (a) through (c) of this section to evaluate the environmental impact of human exposure to RF radiation as specified in § 1.1307(b) of this part, except for portable devices as defined in § 2.1093 of this chapter as these evaluations shall be performed according to the SAR provisions in § 2.1093.

Frequency Range [MHz]	Electric field strength [V/m]	Magnetic field strength [A/m]	Power density [mW/cm^2]	Avering time [minutes]
Limits for Occupational / Controlled Exposure				
0.3 – 3.0	614	1.63	*(100)	≤6
3.0 - 30	1842/f	4.89/f	*(900/f^2)	<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				
0.3 – 1.34	614	1.63	*(100)	<30
1.34 - 30	824/f	2.19/f	*(180/f^2)	<30
30 - 300	27.5	0.073	0.2	<30
300 - 1500	--	--	f/1500	<30
1500 - 100000	--	--	1.0	<30

Table 5: Requirements – Human exposure

f=frequency
*=Plane-wave equivalent power density

3.1.2 Test Results

For the evaluation of the RF exposure, the maximum conducted output power of BLE technology is obtained from the following test reports: 24/36405324

Technology	Operating Frequency [MHz]	Maximum Conducted Peak Power [dBm]	Antenna gain [dBi]	EIRP [dBm]
BLE	2402	8.6	3.3	11.9
	2440	7.4		10.7
	2480	4.6		7.9

Table 6: Maximum Conducted Output Power – BLE

Therefore, through the following equation, is computed the power density at each frequency transmitted band for a minimum distance of 20 cm between the DUT and the person to comply with the power density limit.

$$S = \frac{EIRP}{4 * \pi * d^2}$$

Where:

S = Power density (mW/cm^2)
EIRP = Radiated output power of an isotropic antenna (mW)
d = Distance to the center of radiation of the antenna (cm). Limit for MPE = 20 cm.

According to Radiofrequency radiation exposure limits of FCC Part 1 Section §1.1310 paragraph (e), the maximum permissible exposure (MPE) for 1500 – 100000 MHz, which the DUT is operating is:

Technology	Operating Frequency [MHz]	Power Density at 20 cm [mW/cm^2]	Power Density Limit [mW/cm^2]	Result
BLE	2402	0.0014	1	PASS
	2440	0.0011		PASS
	2480	0.0005		PASS

Table 7: Power Density Level at 20 cm – BLE