LCIE SUD EST
Laboratoire de Moirans
Z.I. Centr'Alp
170, Rue de Chatagnon
38430 MOIRANS - FRANCE

GENERAL INFORMATION

FCCID: **XKB-OPE15CLBT**

1.1. Product description

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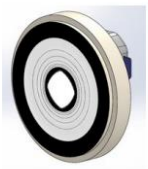
OPReader

OPEN1500
OPEN2500

Products characteristics



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1_Range description

The OPEN1500 and OPEN2500 are designed to be used in transportation world.
It is the best mix between payment world and transportation one.
The reader will be used in validators (OPEN1500) or turnstiles (OPEN2500) as a slave reader.

1_1 OPEN1500

The device will be assembled inside the validator, only the area with the RFID card mark will be visible.

1_2 OPEN2500

The device will be assembled inside the turnstiles, the front will be fully visible

2_Technical baseline

- The electronical boards are the same for the whole range.
- The rear side of the product will be the same whatever the model.

3_Characteristics

3_1 Common characteristics

CPU:	Islero HE
Flash	NFlash 4Gb
RAM:	LPDDR2 4Gb
µSD:	1 x up to 32MB
SAM:	4 x ID-000 or smaller with HSP.
Integrated antenna:	13.56MHz
Card:	ISO14443 A/B
Sound:	Buzzer 70dBA
USB:	1 x Host / 1 x Slave
Serial:	2 x RS232
I/O:	8 x IO TTL.
Ethernet	1 x RJ45

3_2 Common Characteristics (option)

Bluetooth standard V4.1 for communication with host

3_3 Power characteristics

Extended Power	POE: 48V External DC: 12V - 24V

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1.2. Tested System Details

2. SYSTEM TEST CONFIGURATION

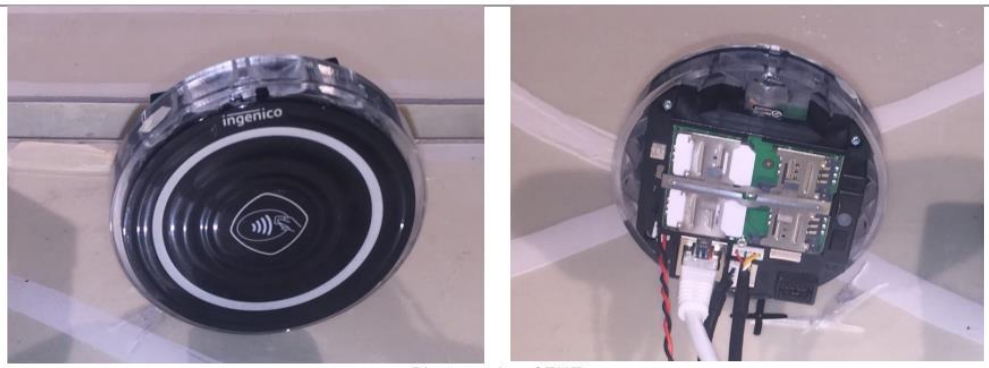
2.1. JUSTIFICATION

All test are performed with 24VDC on supply1
Conducted and radiated emission data are also performed with 48VDC on supply2 (POE).

Open1500 and OPEN 2500 are same electronics, difference is plastic casing.

2.2. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):
OPEN2500 POE/BT/RS232
Serial Number: 18163000149



Photography of EUT

Power supply:

For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Configuration	Comments
Supply1	☑ DC	12-24VDC	/	Configuration n°1	/
Supply2	☑ DC	48VDC	/	Configuration n°2	Power supply on POE (Power Over Eternet)

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply1	L+N	1.	☐	☐	☑	Configuration n°1
Supply2	2 wires	1.3	☐	☐	☑	Configuration n°2
Ethernet_cable	RJ45 (Ethernet)	1.8	☐	☐	☑	/
COM0_cable	RS232	1	☐	☐	☑	/
USB_Device_cable	USB	0.9	☐	☐	☑	/
Access4	microSD (MMC)		☐	☐	☑	/
Access5	SAM1		☐	☐	☑	/
Access6	SAM2		☐	☐	☑	/

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Auxiliary equipment used during test:

Type	Reference	Sn	Comments
CBT Bluetooth tester	ROHDE & SCHWARZ	CBT	A2440007
POE adapter	TP-LINK / TL-POE200A	2168528003068	48VDC
AC/DC power source	TP-LINK Technologies Co	T480050-2C1	Input 100-240Vac Output 48VDC
Laptop	DELL	/	/
Laptop	TOSHIBA	/	/

Equipment information:

Bluetooth Classic Type:	☐ **v1.2**	☐ **v2.0**	☐ **v2.1+EDR**	☐ **v3.0+HS**
	☐ **v4.0**	☑ **v4.1**		☐ **v4.2**
Frequency band:	[2400 – 2483.5] MHz			
Sub-band REC7003:	Annex 3 (a)			
Spectrum Modulation:	☑ FHSS			
Number of Channel:	Maximum:	79	Minimum:	20
Spacing channel:	1MHz			
Channel bandwidth:	1MHz			
Antenna Type:	☐ Integral	☑ External		☐ Dedicated
Antenna connector:	☑ Yes	☐ No		☐ Temporary for test
Transmit chains:	☐ 1			
	Single antenna			
	Gain 1: -1.3dBi			
Beam forming gain:	No			
Receiver chains	1			
Type of equipment:	☑ Stand-alone	☐ Plug-in		☐ Combined
Ad-Hoc mode:	☐ Yes		☑ No	
Dwell time:	400ms			
Adaptivity mode:	☑ Yes (Load Based DAA)	☐ Off mode		☐ No
	Clear Channel Assessment Time:			Xµs
Duty cycle:	☐ Continuous duty	☐ Intermittent duty		☑ 100% duty
Equipment type:	☑ Production model		☐ Pre-production model	
Operating temperature range:	Tmin:	☑ -20°C	☐ 0°C	☐ X°C
	Tnom:	20°C		
	Tmax:	☐ 35°C	☑ 55°C	☐ X°C
Type of power source:	☑ AC power supply	☑ DC power supply		☐ Battery
Operating voltage range:		Configuration n°1 (Supply1)		Configuration n°2 (Supply2)
	Vmin:	☑ 10.8VDC		☑ 43.2VDC
	Vnom:	☑ 24 VDC		☑ 48 VDC
	Vmax	☑ 26.4 VDC		☑ 52.8 VDC
Geo-location capability:	☐ Yes (The geographical location determined by the equipment is not accessible to the end user as defined in section 4.3.1.13.2 of ETSI EN 300 328 V2.1.1 standard)		☑ No	
Minimum performance criteria for Receiver blocking test:	☑ PER less than or equal to 10%		☐ Alternative performance criteria (4)	

(4): Description of the alternative performance criteria:

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CHANNEL PLAN					
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
Cmin: 0	**2402**	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	**Cmid: 39**	**2441**	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	**Cmax: 78**	**2480**
25	2427	52	2454		
26	2428	53	2455		

DATA RATE				
Available for EUT	**Modulation type**	**Max. Data Rate (Mbps)**	**Packet type**	**Worst Case Modulation**
☐	GFSK	1	1-DM1	☐
☑	GFSK	1	1-DH1	☐
☐	GFSK	1	1-DM3	☐
☑	GFSK	1	1-DH3	☐
☐	GFSK	1	1-DM5	☐
☑	GFSK	1	1-DH5	☑
☐	GFSK	1	AUX1	☐
☑	π/4 DQPSK	2	2-DH1	☐
☑	π/4 DQPSK	2	2-DH3	☐
☑	π/4 DQPSK	2	2-DH5	☑
☑	8DPSK	3	3-DH1	☐
☑	8DPSK	3	3-DH3	☐
☑	8DPSK	3	3-DH5	☑

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Equipment information:

Frequency band:	☑ [13.553–13.567]MHz	☐ [125]kHz	☐ [-] MHz	
Sub-band REC7003:	☑ Annex 9 (j)	☐ Annex 9 (a3)	☐ Annex ( )	
RF mode:	☐ Transmitter	☑ Transceiver	☐ Receiver	☐ Standby
Type:	☑ RFID	☐ EAS	☐ Other:	
Bandwidth:	☐ Narrowband (ISO15693, ISO18000-3…)		☑ Wideband (ISO14443, NFC…)	
Product class – Annex B.2	☑ 1	☐ 2	☐ 3	☐ 4
Channelized system:	☑ No	☐ Yes, channel spacing: kHz		
Equipment intended for use as a	☑ Fixed	☐ Mobile	☐ Portable	
Type of equipment:	☑ Stand-alone	☐ Plug-in	☐ Combined	
Antenna Type:	☐ External		☑ Internal	
Antenna connector:	☐ Permanent external	☐ Permanent internal	☑ None	☐ Temporary (only for tests)
Antenna Gain:	0 dBi			
Duty cycle:	☑ Continuous duty	☐ Intermittent duty	☐ Continuous operation	
Equipment type:	☑ Production model		☐ Prototype	
Temperature range:	Tmin:	☑ -30°C	☐ 0°C	☐ NC
	Tnom:	20°C		
	Tmax:	☐ 35°C	☑ 55°C	☐ NC
Type of power source:	☐ AC power supply	☑ DC power supply	☐ Battery (Select type)	
Test source voltage:		Configuration n°1 (Supply1)	Configuration n°2 (Supply2)	
	Vmin:	☑ 10.8VDC	☑ 43.2VDC	
	Vnom:	☑ 24 VDC	☑ 48 VDC	
	Vmax	☑ 26.4 VDC	☑ 52.8 VDC	

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 or/and ANSI C63.10, FCC Part 15 SubPart 15C.
Radiated testing was performed at an antenna to EUT distance of 10 meters. During testing, all equipment's and cables were moved relative to each other in order to identify the worst case set-up.

1.4. Test facility

Tests have been performed: **November 5th to 21th, 2018**

This test facility has been fully described in a report and accepted by FCC as compliant with the radiated and AC line conducted test site criteria in ANSI C63.4 or/and ANSI C63.10.
This test facility has also been accredited by COFRAC (French accreditation authority for European Union test lab accreditation organization) according to NF EN ISO/IEC 17025, as compliant with test site criteria and competence in 47 CFR Part 15/ANSI C63.4 and EN55032/CISPR32 norms for 89/336/EEC European EMC Directive application. All pertinent data for this test facility remains unchanged.