



**R051-24-10-101516-5/A ED. 0**

**RADIO Measurement  
Technical Report  
COLLOCATION**

**Standard to apply:  
FCC Part 15.209**

**Equipment under test:  
PLUGGED HF RFID READER  
HF-AM1-Ikôn**

**Company:  
PSION TEKLOGIX**

**DISTRIBUTION: Mr FORNIER**

**Company: PSION TEKLOGIX**

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This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole manufactured products of the tested sample.



**PRODUCT:** PLUGGED HF RFID READER

**Reference / model:** HF-AM1-Ikôn (RFID module)

**Serial number:** not communicated (radio module)  
PX0FC8320970 (terminal sample N°3)

**MANUFACTURER:** PSION TEKLOGIX

**COMPANY SUBMITTING THE PRODUCT:**

**Company:** PSION TEKLOGIX

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135 rue René Descartes  
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**Responsible:** Mr FORNIER

**DATE(S) OF TEST:** 27 April 2010

**TESTING LOCATION:** EMITECH ATLANTIQUE laboratory at ANGERS (49) FRANCE  
EMITECH ATLANTIQUE open area test site in LA POUEZE (49)  
FRANCE

**TESTED BY:** M. DUMESNIL  
L. BERTHAUD

## CONTENTS

TITLE	PAGE
1. INTRODUCTION.....	4
2. PRODUCT DESCRIPTION .....	4
3. NORMATIVE REFERENCE.....	4
4. TEST METHODOLOGY .....	4
5. TESTS RESULTS SUMMARY.....	5
6. RADIATED EMISSION LIMITS, GENERAL REQUIREMENTS (TRANSMITTER).....	6
ANNEX 1: OPEN AREA TEST SITE .....	8
ANNEX 2: RADIO APPLICATION FORM.....	9

## **1. INTRODUCTION**

This report presents the results of radio test carried out on the following equipment: PLUGGED HF RFID READER – HF-AM1-Ikôn, in accordance with normative reference.

## **2. PRODUCT DESCRIPTION**

Class: A (industrial environment)

Utilization: RFID reader with Bluetooth and wifi function

Antenna type: incorporated antenna

Operating frequency range: 13.56 MHz and band from 2400 MHz to 2483.5 MHz.

Power source: 115 Va.c. charging dock + 3.7 Vd.c. internal battery.

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.

FCC Part 15 (2009)	Code of Federal Regulations Title 47 - Telecommunication Chapter 1 - Federal Communications Commission Part 15 - Radio frequency devices Subpart C - Intentional Radiators
ANSI C63.4 (2009)	American National Standard for Methods of measurement of Radio-Noise from low-voltage. Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

## **4. TEST METHODOLOGY**

Radio performance tests procedures given in part 15:

- Paragraph 33: frequency range of radiated measurements
- Paragraph 35: measurement detector functions and bandwidths
- Paragraph 209: radiated emission limits; general requirements

**5. TESTS RESULTS SUMMARY**

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.209	RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS	X				note

NAp: Not Applicable

NAs: Not Asked

*Note: collocation transmitter; Bluetooth, Wifi, RFID*

**Conclusion:**

The sample of PLUGGED HF RFID READER – HF-AM1-Ikôn submitted to the tests complies with the regulations of the standard FCC Part 15 for collocation transmitter in accordance with the limits or criteria defined in this report.

**6. RADIATED EMISSION LIMITS, GENERAL REQUIREMENTS (TRANSMITTER)**

**Standard:** FCC Part 15

**Test procedure:** paragraph 15.209

**Test equipments:**

TYPE	BRAND	EMITECH NUMBER
Test receiver ESH3	Rohde & Schwarz	1058
Test receiver ESVS 10	Rohde & Schwarz	1219
Spectrum analyzer FSP 40	Rohde & Schwarz	4088
Loop antenna	EMCO	1406
Biconical antenna HP 11966C	Hewlett Packard	0728
Log periodic antenna HL 223	Rohde & Schwarz	1999
Open site	Emitech	1274
Antenna RGA-60	Electrometrics	1204
Low-noise amplifier 2 to 18 GHz	Microwave DB	1922
High pass filter HP12/3200-5AA	Filtek	
Antenna WR42	IMC	1939
Low-noise amplifier 18 to 26 GHz	ALC	3036
Multimeter 77-2	Fluke	0812
Meteo station meteostar	Bioblock Scientific	0943
Variac R213	Dereix	1419

**Test set up:**

The system is tested in an open area test site (OATS).

The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

**Frequency range:** from 9 kHz to harmonic 10 ( $F_{carrier} \leq 10 \text{ GHz}$ )

**Bandwidth:** 120 kHz ( $F < 1 \text{ GHz}$ )  
1 MHz ( $F > 1 \text{ GHz}$ )

**Distance of antenna:** between 30 m and 3 m according the frequencies and the limits.

**Antenna height:** 1 to 4 meters

**Antenna polarization:** vertical and horizontal, only the highest level is recorded.  
for  $F < 30 \text{ MHz}$ , antenna was oriented in the vertical plane.  
The lowest point of the loop is in above ground level.

**Equipment under test operating condition:**

The equipment under test is blocked in continuous transmission mode, modulated by internal data signal.

The Bluetooth wifi and RFID transmission modes are also transmitting continuously.

In addition, the equipment is in battery charging mode.

For information, level of RFID carrier :

	Field strength (dBμV/m) at frequency:
	13.56 MHz
Normal test conditions	43.52

Polarization of test antenna: perpendicular at the equipment at 0 degree  
 Position of equipment: vertical position (azimuth: 270 degrees)

For information, level of WIFI carrier :

	Level (dBm) at frequency:
	2442 MHz
Normal test conditions	19.71

Polarization of test antenna: vertical (height: 145 cm)  
 Position of equipment: vertical position (azimuth: 15 degrees)

The level of BLUETOOTH carrier is not communicated.

**Results:**

Ambient temperature (°C): 18.5  
 Relative humidity (%): 59

Sample N° 3

Power supply: 115 Va.c. charging dock + 3.7 Vd.c. internal battery

Not any intermodulation spurious has been detected.

Applicable limits: see section 15.209

*Note: any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.*

**Measurement uncertainty:**

F < 62.5 MHz:	±4.4 dB
62.5 MHz ≤ F ≤ 1 GHz:	±2.6 dB
F > 1 GHz:	±4.1 dB

**TEST CONCLUSION:**

RESPECTED STANDARD

□□□ End of report, 2 annexes to be forwarded □□□

## ANNEX 1: OPEN AREA TEST SITE





## ANNEX 2: RADIO APPLICATION FORM

**EMITECH**

Questionnaire de demande de prestation

Version française tapez 1 :

English version tape 2:

1

### A - PARTIE ADMINISTRATIVE

Il est important de remplir complètement les questionnaires car ils sont nécessaires à l'établissement de notre proposition technique et financière ainsi qu'au bon déroulement de la prestation.

#### A1 - Client demandeur de la prestation (qui sera destinataire du rapport en diffusion)

Société :	PSION TEKLOGIX		
Contact :	Nicolas FORNIER		
Adresse :	135 rue René Descartes, Parc de la Duranne 13591 Aix en Provence		
Tél :	04.42.908.809	Fax :	04.42.908.888
		e-mail :	nicolas.fornier@psionteklogix.com

#### A2 - Représentant ou Mandataire (à remplir si différent du demandeur)

Société :			
Contact :			
Adresse :			
Tél :		Fax :	
		e-mail :	

#### A3 - Constructeur (à remplir si différent du demandeur)

Société :			
Contact :			
Adresse :			
Tél :		Fax :	
		e-mail :	

#### A4 - Description du produit / système

Désignation :	Plugged HF RFID Reader		
Référence :	RFID module HF-AM1-Ikôn		
Type :			
Fonction :			
Autre :			

DQS S41 000 FOR 00001-01

**B - PARTIE TECHNIQUE**

**Description du produit / système**

Désignation :   
 Référence :   
 Numéro de série :   
 Fonction :   
 Si le produit est embarqué sur véhicule, type de véhicule :   
 Autre :

Equipement de série     présérie     prototype

**Alimentation**

Monophasé :  Vac      Fréquence ou plage de fréquence :   
 Triphasé :  Vac      Présence neutre (oui / non) :   
 Batterie :  Vdc      Autres renseignements :   
 Alimentation DC :  Vdc  
 Adaptateur secteur :   
 Puissance :  W  
 Courant nominal :  A

**Autres**

Poids (kg) :       Taille (L x l x h) (m) :   
 Température d'utilisation min :   
 Température d'utilisation max :   
 Liquide ou produit dangereux \* :   
 Connexions spécifiques (eau, gaz, \*) :   
 \* fournir les consignes de sécurité appropriées

**Câbles d'entrées / sorties**

	Désignation <small>(préciser le type : RTC, RNIS, ADSL, Ethernet, RS 232, ... et quantité)</small>	Blindé (O/N)	Long. déclarée
Cable :	Docking connector	N	
Cable :			
Cable :			
Cable :			
Cable :			
Cable :			
Cable :			
Cable :			
Cable :			
Cable :			
Cable :			
Cable :			

Autre :

### B3 - Partie spécifique RADIO

A renseigner impérativement si votre besoin concerne la RADIO

Emetteur / Récepteur	
Type :	<input type="checkbox"/> Emetteur <input type="checkbox"/> Recepteur <input checked="" type="checkbox"/> Emetteur/Récepteur <input checked="" type="checkbox"/> Mono freq. <input type="checkbox"/> Bi freq. <input type="checkbox"/> Multi freq. Nbr de canaux : <input type="text"/>
Fréquence d'émission :	<input type="text" value="13.56 MHz"/> Puissance : <input type="text" value="1 W"/>
Modulation :	<input type="text" value="Amplitude modulation"/>
Niveau du signal modulant :	<input type="text"/>
Rapport cyclique d'émission :	<input type="text" value="continous"/>
Fréquence de réception :	<input type="text" value="13.56 MHz"/>
Classe du récepteur :	<input type="text" value="1"/>
Autre :	<input type="text"/>

Antenne	
Type :	<input checked="" type="checkbox"/> Intégrée <input type="checkbox"/> Externe fixe (1) <input type="checkbox"/> Externe détachable (1)
(1) décrire le type d'antenne, sa longueur et le type de connecteur :	
<input type="text" value="Antenna loop (55 X 30 mm)"/>	
Gain d'antenne :	<input type="text"/> dBi

Autres	
Destination de l'équipement :	<input type="checkbox"/> Transm. data <input type="checkbox"/> Télécommande <input type="checkbox"/> Phonie <input type="checkbox"/> Télésure <input type="checkbox"/> Téléalarme <input checked="" type="checkbox"/> Autre :
Possibilité de bloquer l'émetteur en ém. permanente :	<input checked="" type="checkbox"/> Modulé <input checked="" type="checkbox"/> Non modulé
Possibilité de bloquer le récepteur en réc. permanente :	<input type="checkbox"/>
Autres informations :	
<input type="text"/>	