



Nemko USA, Inc.

2210 Faraday Avenue, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005

CERTIFICATION TEST REPORT

Report Number: 2013 05237011 FCC

Nex Number: 237011

Applicant: IPS GROUP, INC.
5601 OBELIN DRIVE
San Diego, CA 92121


Equipment Under Test (EUT): DEVICE CONTROLLER

Model: M3

FCC ID: SGWIPS2007SSPM

In Accordance With: FCC Part 15 Subpart C, 15.225

Tested By: Nemko USA Inc.
2210 Faraday Avenue, Suite 150
Carlsbad, CA 92008

Authorized By: 
Alan Laudani, EMC/RF Test Engineer

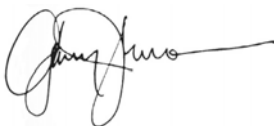
Date:

Total Number of Pages: 14

1 Applicant Affirmation

Gary Thomas representing IPS Group Inc. hereby affirms:

- a) That he/she has reviewed and concurs that the test shown in this report are reflective of the operational characteristics of the device for which certification is sought;
- b) That the device in this test report will be representative of production units;
- c) That all changes (in hardware and software/firmware) to the subject device will be reviewed.
- d) That any changes impacting the attributes, functionality or operational characteristics documented in this report will be communicated to the body responsible for approving (certifying) the subject equipment.



Gary Thomas
Printed name of official

Signature of official

5601 Obelin Drive
Address

May 9, 2013
Date

858-768-2401 x211
Telephone number

gary.thomas@ipsgroupinc.com
Email address of official

NOTE—This affirmation must be signed by the responsible party before it is submitted to a regulatory body for approval.



Section1: Summary of Test Results

General

All measurements are traceable to national standards

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15; Subpart C and IC RSS-210. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made in a 10m semi-anechoic chamber. A description of the test facility is on file with the FCC and IC.

The assessment summary is as follows:

Apparatus Assessed:	RFID Reader
Model:	M3
Specification:	FCC Part 15 Subpart C, 15.225
Date Received in Laboratory:	May 3, 2013
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None



1.1 Report Release History

REVISION	DATE	COMMENTS
-	May 3, 2013	Prepared By: Mark Phillips
-	May 9, 2013 Error! Reference source not found.	Initial Release: Alan Laudani

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

Nemko USA Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko USA Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.


TESTED BY:  Date: **Error! Reference source not found.**
Mark Phillips, EMC Test Engineer

TABLE OF CONTENTS

1	Applicant Affirmation	2
	Section1: Summary of Test Results	3
1.1	Report Release History	4
	Section 2: Equipment Under Test.....	6
2.1	Product Identification	6
2.2	Samples Submitted for Assessment	6
2.3	Theory of Operation	7
2.4	Technical Specifications of the EUT	7
	Section 3: Test Conditions	8
3.1	Specifications	8
3.2	Deviations From Laboratory Test Procedures.....	8
3.3	Test Environment.....	8
3.4	Test Equipment.....	8
	Section 4: Observations	9
4.1	Modifications Performed During Assessment	9
4.2	Record Of Technical Judgements.....	9
4.3	EUT Parameters Affecting Compliance	9
4.4	Test Deleted.....	9
4.5	Additional Observations	9
	Section 5: Results Summary.....	10
5.1	Test Results	10
	Appendix A: Test Results.....	11
	Section 15.225(a) – Field Strength of Emissions	11
	Section 15.225 (d) – Spurious Emissions Outside of the band	13

Section 2: Equipment Under Test

2.1 Product Identification

The Equipment Under Test was identified as follows:

M3 RFID Reader

2.2 Samples Submitted for Assessment

The following sample of the apparatus has been submitted for type assessment:

Sample No.	Description	Serial No.
237011-1	M3 Parking Meter with RF ID Reader	NONE



2.3 Theory of Operation

The M3 is a Parking Meter with RFID Reader. Its function is for parking control and fee collection.

The EUT's performance during test was evaluated against the performance criterion specified by applicable test standards. Performance results are detailed in the test results section of this report.

2.4 Technical Specifications of the EUT

Manufacturer:	IPS Group Inc.
Operating Frequency:	13.56 MHz (13.553 – 13.567 MHz)
Number of Operating Frequencies:	1
Rated Field Strength:	15,848 uV/m@30 meters (84 dBuV/m@30m or 103.1 dBuV/m@10m)
Modulation:	None
Antenna Type:	Integral
Antenna Connector:	None
Power Source:	7 Vdc

Section 3: Test Conditions

3.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.225
Operation within the band 13.110 – 14.010 MHz

3.2 Deviations From Laboratory Test Procedures

No deviations from Laboratory Test Procedure

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	20-25 °C
Humidity range	50-60%

3.4 Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
911	Spectrum Analyzer	Agilent	E4440A	US41421266	10/15/2012	10/15/2013
133	Antenna, Loop	Electrometrics	ALR-25M	678	7/18/2011	7/18/2013
901	Preamplifier	Sonoma	310 N	130607	10/15/2012	10/15/2013

Registration of the 10m Semi-anechoic chamber is on file with the Federal Communications Commission and with Industry Canada under Site Number 2040B-3.



Section 4: Observations

4.1 Modifications Performed During Assessment

No modifications were performed during assessment.

4.2 Record of Technical Judgements

No technical judgements were made during the assessment.

4.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

4.4 Test Deleted

Frequency stability testing was not repeated for this assessment as the modifications made to the RFID circuit were deemed not to impact the frequency stability.

4.5 Additional Observations

There were no additional observations made during this assessment.



Section 5: Results Summary

This section contains the following:

FCC Part 15 Subpart C: §15.225

The column headed “Required” indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No: not applicable / not relevant

Y Yes: Mandatory i.e. the apparatus shall conform to these tests.

N/T Not Tested, mandatory but not assessed. (See section 4.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

5.1 Test Results

Part 15C	Test Description	Required	Result
15.207 (a)	Conducted Emission Limit	N	N/T
15.225(a)	Field Strength of Emissions	Y	Pass
15.225(d) 15.209	Spurious Emissions Outside of the band	Y	Pass
15.225(e)	Frequency Stability	N/T	N/T

Appendix A: Test Results

Section 15.225(a) – Field Strength of Emissions

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

Test Conditions:

Sample Number:	MK 3	Temperature:	25°C
Date:	5/3/13	Humidity:	56%
Modification State:	As delivered	Tester:	Mark Phillips
		Laboratory:	10m Chamber

Additional Observations:

- All measurements were performed using a peak detector.
- RBW is 1MHz while VBW is 3MHz.
- Spectrum was investigated up to 30 MHz
- There are no emissions other than the fundamental

Sample Computation (Radiated Emissions Data Sheet):

Correction factor
@ 13.56 MHz = 35.1 dB/m
= Antenna factor + Cable loss – Preamp gain
= 35.1 + 0 - 0
Corrected reading = Max. reading + Correction factor
= 28.7 + 35.1
= 63.8 dBμV/m

Calculation of limit at 10m:

Limit at 30 m = 15,848 uV/m or 84 dBuV/m
Correction factor = 40 dB per decade of distance.
Measurement distance = 10 m
 $40 \log(30/10) = 19.1 \text{ dB}$
 $84 \text{ dBuV/m} + 19.1 \text{ dB} = 103.1 \text{ dBuV/m@10m}$



Test Results:

Radiated Emissions Data											
Job # :		Date : 5/3/2013		Page 1 of 1							
NEX# :		Time : 17:30									
		Staff : mp									
Client Name :		IPS				EUT Voltage :		7.0VDC			
EUT Name :		Parking Meter				EUT Frequency :					
EUT Model # :		MK 3				Phase:					
EUT Serial # :		None									
EUT Config. :		RFID Transmitting									
						Distance < 1000 MHz:		3 m			
						Distance > 1000 MHz:		3 m			
Specification :		FCC Part 15 Subpart C, 15.225 & 15.209									
Loop Ant. #:		133									
Bicon Ant. #:		NA		Temp. (°C) :		21					
Log Ant. #:		NA		Humidity (%) :		52					
DRG Ant. #		NA		Spec Analyzer #:		911					
Cable LF#:		SAC 10m		Analyzer Display #:		911					
Cable HF#:		NA		Quasi-Peak Detector #:		911					
Preamp LF#:		901		Duty Cycle (%) :		NA					
Preamp HF#		NA									
Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated. Measurements above 1 GHz are Average values, unless otherwise stated.											
Meas. Freq. (MHz)	Meter Reading Vertical	Meter Reading Horizontal	Det.	EUT Side DEG	Ant. Height cm	Max. Reading (dBµV)	Corrected Reading (dBµV)	Spec. limit (dBµV)	CR/SL Diff. (dB)	Pass Fail	Comment
13.560	26.6	28.7	P	360.0	100.0	28.7	63.8	103.1	-39.3	Pass	NFC / RFID Output Power

No other emissions detected within 20 dB of the 15.225 limits.

Section 15.225 (d) – Spurious Emissions Outside of the band

(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

Test Conditions:

Sample Number:	MK 3	Temperature:	25°C
Date:	5-3-13	Humidity:	56%
Modification State:	As delivered	Tester:	Mark Phillips
		Laboratory:	Nemko

Test Results:

No emissions detected within 20 dB of the specification limit.

Additional Observations:

- All measurements below 1 GHz were performed at 3m employing a CISPR quasi-peak detector.
- The Spectrum was searched from 9 kHz to 30 MHz.
- Emissions were investigated in Transmit mode.
- There were no emissions found other than the fundamental (Section 15.225(a)).



Test Setup Photo

