SGS United Kingdom Ltd.

International Electrical Approvals

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Electromagnetic Compatibility

Test of:	RF Card Entry Reader
Model Number:	25361
Applicant:	PAC International Ltd
Test Type:	Compliance
Test Specification:	FCC CFR47, part 15.209 (up-to 30 MHz) only.
Test Result:	Complied
SGS Serial Number:	DUR 24094.5/EMC/LS/02
Date of Receipt:	30th May 2002
Date of Test(s):	30th May 2002
Date of Issue:	10th January 2003
Issue Number:	3

This report refers only to the sample submitted for test.

Test Engineer	***Authorised Signatory***
L.Steel	A. Reynard Technical Manager

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1. Client Information

Company Name:	PAC International Ltd
Address:	1 Park Gate Close, Bredbury, Stockport, SK6 2SZ.
Contact Person:	Shaun Byrne
Telephone:	0161 406 3400
Facsimile:	0161 430 8658

2. Details Of Test Laboratory

Company Name:	SGS International Electrical Approvals
UKAS Accreditation Number:	1116
Address:	South Industrial Estate, Bowburn, Co. Durham, DH6 5AD.
Contact Persons:	Mr Alan Reynard
Telephone:	0191 377 2000
Facsimile:	0191 377 2020

3. Equipment Under Test (EUT)

3.1 Identification Of EUT

Model Number:	25361
Unique Identifier:	S0078637
Description of EUT:	RF Card Entry Reader
Internal Clock Frequencies: (Maximum)	11.0592 MHz
Supply Voltage:	18V DC from a Controller (Controller supply = 120 V AC, 60 Hz)
Classification:	Intentional and Unintentional Radiator
Accessories Supplied:	2100 Controller

4. Test Specification, Methods and Procedures

4.1 Test Specification(s)

Specification(s)	Title
FCC CFR 47 : October 1999 Part 15.209 only	Code Of Federal Regulations

4.2 Purpose Of Test

To perform the radiated emissions test to the above specification in the frequency range 9 kHz to 30 MHz only, as requested by the client.

4.3 Methods and Procedures

The standard listed above refers to the following tests: -

CFR 47 Clause	Test
15.209	Radiated Emissions

5. Deviations or Exclusions from the Test Specifications

There were no deviations from the test specifications.

6. Operation of the EUT During Testing / Configuration and Peripherals

6.1 Operation of EUT during testing.

Refer to individual test results sections for details of EUT operation during testing.

6.2 Configuration and Peripherals

The EUT was connected to a controller, (Manufacturer: PAC International, Model No: 25566, Serial No: Not supplied) in order to provide power to the EUT. The controller front panel was disconnected during the tests since this is an intentional transmitter also, which operates at the same frequency as the EUT.

The controller had its ports terminated as follows:

i) relay ports – 1m leads attached with 150 ohm terminating resistors

ii) Tamper/Override, six wire bus port, printer RS232 port – 1m leads attached with 150 ohm resistors in series with a 100 nF capacitors as terminations

7. Test Results

7.1 General Comments

The test methods used are referred to in the individual test results sections of this test report.

7.2 Modifications Made to the EUT

No modifications were made to the EUT during the testing process.

7.3 Summary of Test Results

CFR 47 Clause	Test	Result
15.209 (Up-to 30 MHz)	Radiated Emissions	Complied

Result

In the configuration tested, the EUT complies with the requirements of Clause 15.209 of CFR 47 : October 1999, up-to a frequency of 30 MHz.

Full details of all tests can be found in the test results section of this report.

7.4 Radiated Emissions Test Results – 15.209

CFR Clause	15.209
Frequency Range	9 kHz to 30 MHz

Operating Mode

The compliance test was performed with an authorised card presented to the reader.

Test Results

Peak Measurements

Frequency MHz	Corrected Peak Measurement** (dBμV/m)	Limit (dBμV/m)	Measurement Distance (metres)
*0.153	-18.55	23.88	300
0.098	-33.61	27.77	300
0.460	-44.15	14.34	300
[1]0.250	-53.98	19.64	300
[1]0.400	-53.98	15.56	300
[1]0.550	-14.08	32.79	30
[1]0.700	-14.08	30.70	30
[1]0.850	-14.08	29.01	30
[1]0.900	-14.08	28.51	30

*Indicates EUT carrier frequency. The supply voltage to the controller was varied between 85% and 115% to maximise the carrier level.
[1]Indicates typical noise floor figures of test equipment.

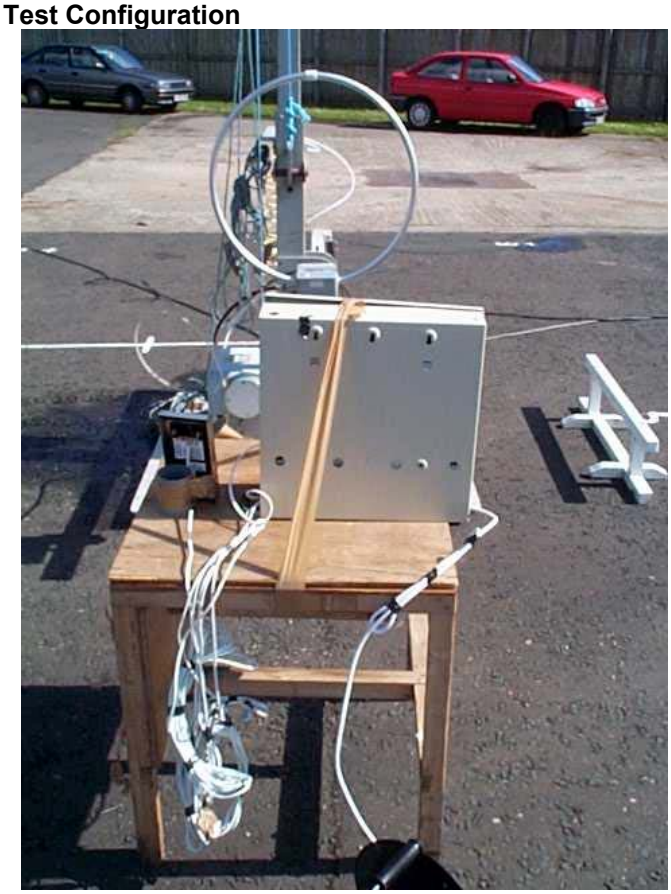
Test Method

As per ANSI 63.4 : 1992

** Measurements performed at a test distance of 1m and extrapolated to correct distance of 300m and 30m respectively, using a factor of 40 dB/decade, hence a correction factor of –99.08 for 300m and –59.08 for 30m was used. The corrected levels are shown above.

Measurement detector details: Peak Detector, 300 Hz bandwidth where F=<150kHz, 10 kHz bandwidth where F=>150 kHz

Radiated Emissions Test Configuration



Radiated Emissions Environmental Conditions

Power Supply (to controller)	120V AC, 60 Hz
Temperature	13.5°C
Relative Humidity	62%
Barometric Pressure	987mb

Radiated Emissions Measurement Uncertainties

Frequency	± 200kHz
Amplitude	± 4.6dB

The uncertainties stated are calculated in accordance with the requirements of UKAS with a confidence level of 95%.

Test Equipment Used

Equipment Type	Model Number	Last Calibration Date
Loop Antenna	EMCO 6502	Dec 00
Spectrum Analyser	HP8563E	Nov 00