

# TEST REPORT



Testing Certification # 1367-01

Laboratory ID

PRODUCT SAFETY ENGINEERING, INC.  
12955 Bellamy Brothers Boulevard  
Dade City, Florida 33525 USA  
PH (352) 588-2209 FX (352) 588-2544

Submitter ID

CrossMatch Technologies  
3960 RCA Blvd  
Suite 6001  
Palm Beach, FL 33410

Report Issue Date: 12 Oct 2009

Test Report Number: 09F356C

Sample S/N: None

Model Designation: SMC800iW

Sample Receipt Date: 19 Aug 2009

Product Description: Mobile Biometric Device

Sample Test Date: see data sheets

Description of non-standard test method or test practice: **None**

Estimated Measurement Uncertainty: **Not Applicable**

Special limitations of use: **None**

Traceability: **reference standards of measurement have been calibrated by a competent body using standards traceable to the NIST.**

According to testing performed at Product Safety Engineering, Inc., the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in regulations indicated on page (3) of the test report. The test results contained herein relate only to the model(s) identified above. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Project Engineer, I hereby declare that the equipment tested as specified above conforms to the requirements indicated on page (3) of the test report.

Signature \_\_\_\_\_

Name Jack Garner

Title Test Engineer

Date \_\_\_\_\_

**Reviewed by:**

Approved Signatory \_\_\_\_\_ Steve Hoke Date \_\_\_\_\_

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*Test Report Number 09F356C*

Product Safety Engineering, Inc 12955 Bellamy Brothers Blvd. Dade City, FL 33525  
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## **DIRECTORY - EMISSIONS**

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## EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

- EN 61000-6-3:2001

- RSS-210 Issue 7

- EN 55011 : 2006 /A2:2007

- Group 1

- Group 2

- Class A

- Class B

- EN 300 330-2 V1.3.1:2006

- EN 55014 -1: 2001/A1:2001 A2:2002

- Household appliances and similar

- Portable tools

- Semiconductor devices

- EN 55022:2006

- Class A

- Class B

- AS/NZS CISPR 22:2006

- Class A

- Class B

- ICES-003

- Class A

- Class B

- CNS 13438

- Class A

- Class B

- VCCI V-3/2007.4

- Class A

- Class B

- FCC Part 15 Subpart B

- Class A

- Class B

- Certification

- Verification

- Declaration of Conformity

- FCC Part 15.225

- Certification

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## Environmental conditions during testing:

	LAB	OATS
Temperature: *	_____	: _____
Relative Humidity: **	_____	: _____

\* The ambient temperature during the testing was within the range of (50° - 104° F) unless indicated above.

\*\* The humidity levels during the testing was within the range of (10% - 90%) relative humidity unless indicated above.

Power supply system : EUT was tested as hand held, battery operated outside of the cradle

## Sign Explanations:

- not applicable  
 - applicable

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## Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The **CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)** measurements were performed at the following test location:

- Test not applicable

- Darby Test Site (Open Area Test Site)
- Darby Laboratory

**Test equipment used :**

<b>Model Number</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Serial Number</b>
□ - 8028-50	Solar	50 Ω LISN	829012, 829022
□ - 3825/2	Solar	50 Ω LISN	924840
□ - EMC-30	Electro-Metrics	EMI Receiver	191
□ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
□ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ - 85662A	Hewlett Packard	Analyzer Display	2403A07352
□ - 8028-50	Solar	50 Ω LISN	903725, 903726
□ - FCC-TLISN-T4-02	Fisher Custom Com.	Telecom ISN	20454
□ - FCC-TLISN-T8-02	Fisher Custom Com.	Telecom ISN	20452

## Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The **RADIATED EMISSIONS (MAGNETIC FIELD)** measurements were performed at the following test location:

- Darby Test Site (Open Area Test Site)
- 
- 

**at a test distance of :**

- 3 meters
- 30 meters

- Test not applicable

**Test equipment used :**

<b>Model Number</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Serial Number</b>
□ - 3148	EMCO	Log Periodic Antenna	00044783
□ - BIA-25	Electro-Metrics	Biconical Antenna	4283
■ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
■ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
■ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ - ALR-30M	Electro-Metrics	Loop Antenna	824
■ - 8447D	Hewlett Packard	Preamplifier	2944A06832
□ - EMC-30	Electro-Metrics	EMI Receiver	191
■ - ALA-130/A	Antenna Research	Loop Antenna	106

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## Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The **RADIATED EMISSIONS (ELECTRIC FIELD)** measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

- Test not applicable

- Darby Site (Open Area Test Site)
- Darby Lab
- 

at a test distance of :

- 3 meters
- 10 meters
- 30 meters

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
□ - HLP 3003C	EMC Automation	Hybrid Periodic Antenna	017501
■ - 8447D	Hewlett-Packard	Preamplifier (26dB)	2944A06832
■ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
■ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
■ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
□ - BIA 25	Electro-Metrics	Biconical Antenna	4283
□ - EMC-30	Electro-Metrics	EMI Receiver	191
□ - 8568B	Hewlett Packard	Spectrum Analyzer	2407A03213
□ - 85650A	Hewlett Packard	Quasi-Peak Adapter	2043A00358
□ - 85662A	Hewlett Packard	Analyzer Display	2340A05806
■ - LPA30	Electro-Metrics	Log Periodic	2280
□ - BIA-30	Electro-Metrics	Biconical Antenna	3852
■ - 3104C	EMCO	Biconical Antenna	00075927

## Emissions Test Conditions): CONDUCTED EMISSIONS - TELECOMMUNICATIONS PORT

The **INTERFERENCE POWER** measurements were performed in the frequency range 0.15 MHz - 30 MHz at the following test location :

- Test not applicable

- Darby Lab
- 

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
□ - EMC-30	Electro-Metrics	EMI Receiver	191
□ - FCC-TLISN-T8-02	Fischer Custom Com	T-LISN	20452
□ - FCC-TLISN-T4-02	Fischer Custom Com	T_LISN	20454
□ -			
□ -			
□ -			

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**The EQUIVALENT RADIATED EMISSIONS** measurements in the frequency range **GHz - GHz** were performed in a horizontal and vertical polarization at the following test location :

- Darby Test Site (Open Area Test Site)
- 
- 
- 

**at a test distance of:**

- 1 meters
- 3 meters
- 10 meters

**■ - Test not applicable**

**Test equipment used :**

<b>Model Number</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Serial Number</b>
<input type="checkbox"/> - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
<input type="checkbox"/> - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
<input type="checkbox"/> - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
<input type="checkbox"/> - 8449B	Hewlett-Packard	Preamplifier	3008A00320
<input type="checkbox"/> - 3115	Electro-Mechanics	Double Ridge Guide Horn	3810

**The ANTENNA TERMINAL DISTURBANCE VOLTAGE** in the frequency range **30 MHz - 1,000 MHz** were performed.

- Darby Test Site (Open Area Test Site)
- Laboratory
- 
- 

**■ - Test not applicable**

<b>Model Number</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Serial Number</b>
<input type="checkbox"/> - 2F9-3C4-3C5	Wavecom	UHF PAL TV Modulator	185879
<input type="checkbox"/> - 2F1-3C4-3C5	Wavecom	VHF PAL TV Modulator	157728
<input type="checkbox"/> - A-8000	IFR	Spectrum Analyzer	1306
<input type="checkbox"/> - 8648B	Hewlett-Packard	Signal Generator	3623A01433
<input type="checkbox"/> - 8648B	Hewlett-Packard	Signal Generator	3623A01477
<input type="checkbox"/> - LMV-182A	Leader	RMS Milli-Voltmeter	8010091
<input type="checkbox"/> - 3202	Krhon-Hite	Active filter	5899
<input type="checkbox"/> - FMT115	Leaming	FM Modulator	NONE
<input type="checkbox"/> - 371	UDT	Optical power meter	06657
<input type="checkbox"/> - TSG95	Tektronix	PAL video / Audio generator	B028883
<input type="checkbox"/> -			

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## **Equipment Under Test (EUT) Test Operation Mode - Emission tests :**

**The device under test was operated under the following conditions during emissions testing:**

- Standby
- Test program (H - Pattern)
- Test program (color bar)
- Test program (customer specific)
- Practice operation
- Normal Operating Mode
- 

### **Configuration of the device under test:**

- See System Under Test Information in Appendix B

### **Rationale for EUT setup / configuration:**

The EUT was battery operated as a hand held device

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## Emission Test Results:

### Conducted emissions 150 kHz - 30 MHz

The requirements are  - MET  - NOT MET  
Minimum limit margin dB at MHz  
Remarks:

### Radiated emissions (magnetic field) 10 kHz - 30 MHz

The requirements are  - MET  - NOT MET  
Minimum limit margin 1.2 dB at 22.56 MHz  
Remarks:

### Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are  - MET  - NOT MET  
Minimum limit margin 1.0 dB at 364.0 MHz  
Remarks:

### Interference Power at the mains and interface cables 30 MHz - 300 MHz

The requirements are  - MET  - NOT MET  
Minimum limit margin dB at MHz  
Remarks:

### Radiated emissions GHz - GHz

The requirements are  - MET  - NOT MET  
Minimum limit margin dB at GHz  
Remarks:

### Conducted Emissions - Telecommunications Port 150kHz - 30 MHz

The requirements are  - MET  - NOT MET  
Minimum limit margin dB at MHz  
Remarks:

## **GENERAL REMARKS:**

We made radiated emission measurements between (1.705) MHz and (1,000) MHz. We followed the measurement procedures detailed in ANSI C63.4-2003.

The EUT was placed in the center of a non-conductive table at a height of (0.8) meters above the ground plane. At each frequency of concern, the orientation of the EUT was checked in three orthogonal positions. The worst-case radiation for fundamental and spurious radiation was determined by rotating the EUT (360) degrees and scanning the height of the antenna between (1-4) meters for both antenna polarities when measuring above (30) MHz. When measuring below (30) MHz, the loop antenna was at a fixed (1) meter height and rotated (180) degrees. When the highest level was observed, the data was recorded.

All testing was performed using the following CISPR bandwidths:

Between (1.705) & (30) MHz - RBW = (9) kHz / VBW = (10) kHz

Between (30) & (1,000) MHz – RBW = (120) kHz / VBW = (300) kHz

Above (1,000) MHz – RBW = (1) MHz / VBW = (1) MHz

All radiated measurements below (30) MHz reported were made with a PEAK detector. All other measurements were made in either peak or quasi-peak as indicated in the test data. The testing was completed with the RFID transmitter operating in a normal mode.

No spurious emissions were found in any restricted bands of operation listed in 15.205.

## **SUMMARY:**

The requirements according to the technical regulations are

- met

- **not** met.

The device under test does

- fulfill the general approval requirements mentioned on page 3.

- **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date August 20, 2009

Testing End Date: August 24, 2009

- PRODUCT SAFETY ENGINEERING INC -

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Test-setup photo(s):  
Conducted emission 150 kHz - 30 MHz

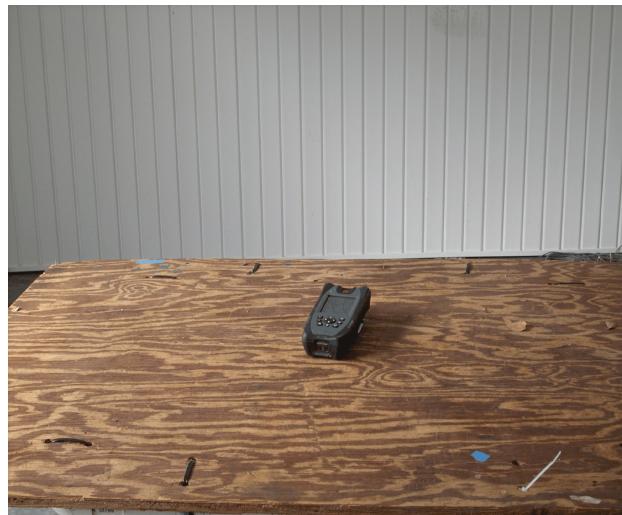
N/A

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Test-setup photo(s):  
Radiated emission 30 MHz - 1000 MHz



Tested as handheld devices for 15.201 & 15.225



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# **APPENDIX**

## **A**

### **Test Equipment Calibration Information**

**&**

### **Test Data Sheets**

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# TEST EQUIPMENT CALIBRATION INFORMATION

Manufacturer	Model	Description	Serial Number	Cal Due
Hewlett Packard	8566B	Spectrum Analyzer	2421A00526	07/07/10
Hewlett Packard	85662A	Display	2403A07352	07/07/10
Hewlett Packard	85650A	Quasi-Peak Adapter	2043A00209	07/07/10
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06832	12/18/09
Hewlett Packard	8568B	Spectrum Analyzer	2407A03213	
Hewlett Packard	85662A	Display	2340A05806	
Hewlett Packard	85650A	Quasi-Peak Adapter	2043A00358	
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06901	
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	1937A03247	
Hewlett Packard	8449B	Preamp 1 - 26.5 GHz	3008A00320	
EMCO	3148	Log Periodic Antenna	00044783	
Electro-Metrics	LPA 30	Log Periodic Antenna	2280	01/21/10
Electro-Metrics	BIA 30	Biconical Antenna	3852	01/21/10
Electro-Metrics	BIA 25	Biconical Antenna	4283	
Electro-Mechanics	3115	Double Ridge Guide Ant.	3810	
Electro-Metrics	ALR30M	Magnetic Loop Antenna	824	
Solar	8012	LISN	924840	
Solar	8028	LISN	829012/809022	
Solar	8028	LISN	903725/903726	
Schwartzbeck	MDS-21	Absorbing Clamp	02581	
Electro-Metrics	EMC-30	EMI Receiver	191	
Antenna Research	ALA-130/A	Loop Antenna	106	08/24/10
Cole-Palmer	9970-00	Digital Barometer	61493735	
EMC Automation	HLP3003C	Hybrid Log Periodic	017501	
Fischer Custom	FCC-T4-02	Telecom ISN	20454	
Fischer Custom	FCC-T8-02	Telecom ISN	20452	

\* Cal Due Date Format = MM/DD/YY

## **Radiated Emissions Data**

SMC800iW  
Handheld Mode

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**RADIATED DATA SHEET**  
**Below (30) MHz**

FCC Rule Part	Frequency Range	Limit dBuV/M @ 30 meters	Measured Freq. (MHz)	Level dBuV/M	Margin dB
15.225 (a)	13.553 - 13.567	84	13.557	47.3	36.7
15.225 (b)	13.410 - 13.553	50.5	13.543	29.8	20.7
15.225 (b)	13.567 - 13.710	50.5	13.588	30.1	20.4
15.225 (c)	13.110 - 13.410	40.5	13.410	27.8	12.7
15.225 (c)	13.710 - 14.010	40.5	13.928	27.1	13.4
15.225 (d)	1.705 - 13.110	29.5	11.06	28.0	1.5
15.225 (d)	14.010 - 30.0	29.5	22.56	28.3	1.2

## FCC DATA SHEET

### Frequency tolerance

#### §15.225

(e) The frequency tolerance of the carrier signal shall be maintained within +/-0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Temperature	Frequency (Hz)	Tolerance
-20 C	13,557,790	13,557,740 - 13,557,790 = -50
+ 50 C	13,558,150	13,557,740 - 13,558,150 = -410
+ 20 C	13,557,740	0.0001 X 13,557,740 = 1,356

The supply voltage to the host computer was varied from (102) to (138) VAC while we monitored the frequency. The frequency did not change during this voltage variation.

**PASS**

(f) In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

**NOT APPLICABLE**

**Compliance Checklist (per EN 300 330-2) V1.3.1**  
**Section 4 TECHNICAL REQUIREMENT SPECIFICATIONS**

**4.2.1.1 Radiated H-field**

The radiated H-field, as defined in EN 300 330-1 [2], clause 7.2.1.1, shall not exceed the limits in EN 300 330-1 [2], clause 7.2.1.3, table 4. This requirement applies to transmitters with an integral or dedicated loop antenna. Testing was performed at both normal and extremes.

Frequency (MHz)	Limit dBuV/m @ 10 m	Frequency (MHz)	Margin (dB)
13.553 -13.567	93.5	13.556	>20
13.403 - 13.553	60.5	13.543	>20
13.567 -13.717	60.5	13.588	>20
12.953 - 13.403	48.0	NA	>20
13.717 - 14.167	48.0	13.928	>20
12.053 - 12.953	41.5	NA	>20
14.167 - 15.067	41.5	NA	>20
1.705 -12.053	35.5	11.06	7.5
15.067 - 30.0	35.5	22.56	7.2

**4.2.1.2 Carrier Current**

Not applicable - Product Class 3 only

**4.2.1.3 Radiated E-Field**

Not applicable - Product Class 4 only

**4.2.1.4 Permitted frequency range of modulation bandwidth**

The permitted range of the modulation bandwidth shall be within the limits of the assigned frequency band. The EUT complies based on results shown within table of 4.2.1.1. Testing was performed at both normal and extremes.

#### **4.2.1.5 Spurious Emissions**

##### **4.2.1.5.1 Conducted spurious emissions at frequencies below 30 MHz**

Not applicable - Product Class 3 only

##### **4.2.1.5.2 Conducted spurious emissions at frequencies above 30 MHz**

Not applicable - Product Class 3 only

##### **4.2.1.5.3 Radiated spurious emissions at frequencies below 30 MHz**

The EUT complies based on results shown within table of 4.2.1.1.

##### **4.2.1.5.4 Radiated spurious emissions at frequencies above 30 MHz**

No emissions were observed that exceeded the limit shown in table 8 of 300-330-1.

#### **4.2.1.56 Duty Cycle**

The device is declared to be a duty cycle class 4.

# APPENDIX

## B

### System Under Test Description

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Tel (352) 588-2209 Fax (352) 588-2544

## SYSTEM COMPONENTS

\*\*\*\*\*

DEVICE TYPE: EUT, CROSSTMATCH SMC-800iW

\*\*\*\*\*

DEVICE TYPE: CONTACTLESS CARD

\*\*\*\*\*

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## INTERFACE CABLES

\*\*\*\*\*

DEVICE TYPE: EUT      **NONE**

SHIELD:

LENGTH:

CONNECTOR TYPE:

PORT:

\*\*\*\*\*

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## AC LINE CORDS

\*\*\*\*\*

DEVICE TYPE: EUT      **NONE**  
SHIELD:  
LENGTH:  
CONNECTOR TYPE:

\*\*\*\*\*

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# APPENDIX

## C

### Measurement Protocol

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The test methodology followed during the collection of the data included within this technical report was ANSI C63.4:1992.

The EUT was powered by **Internal Batteries** during the collection of data included within.

The data is compared to the CISPR-22 Class B limits.

The "EMI" instrumentation is capable of calculating the final emission level based on the following formula:

Level at the receiver (dB $\mu$ V) + Antenna Correction Factor (dB/M) + Cable Loss (dB) - Preamp Gain (dB) = Actual Level in dB $\mu$ V/M.

The sample calculation below is based on the actual test data collected:

Observed Level	<b>39.2</b>	dB $\mu$ V
ACF	+	<b>15.6</b> dB/M
Cable Loss	+	<b>7.2</b> dB
Preamp Gain	-	<b><u>26.0</u></b> dB
Actual Level		<b>36.0</b> dB $\mu$ V/M @ 364.0 MHz

**Please have a company official review this report and sign.**

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