



Engineering and Testing for EMC and Safety Compliance



Accredited under A2LA Testing Certificate # 2653.01

Certification Report FCC Part 18

Test Lab: Rhein Tech Laboratories, Inc. Phone: 703-689-0368 360 Herndon Parkway Fax: 703-689-2056 Suite 1400 www.rheintech.com Herndon, VA 20170 Email: atcbinfo@rheintech.com		Applicant: Protective Systems Inc. 7100 Monache Mountain Road Inyokern, CA 93527 Phone: 760-377-4400 Contact: James Cornwell Fax: 760-377-4430	
FCC ID	WSK-EMR100	Test Report Date	October 27, 2008
Platform	N/A	RTL Work Order Number	2008176
Model #	EMR100	RTL Quote Number	QRTL08-375
FCC Classification	8CC – Part 18 Consumer Device		
FCC Rule Part(s)	Part 18: Industrial, Scientific, and Medical Equipment (10-01-07)		
FCC Procedure Reference(s)	FCC/OST MP-5 (1986) FCC Methods of Measurements of Radio Noise Emissions from Industrial, Scientific, and Medical Equipment		
Frequency Range (MHz)	Output Power (W)	Frequency Tolerance	Emission Designator
2450	3.7	N/A	N/A

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. Furthermore, there was no deviation from, additions to, or exclusions from the applicable parts of FCC Part 2 and FCC Part 18.

Signature: 

Date: October 27, 2008

Typed/Printed Name: Desmond A. Fraser

Position: President

This report may not be reproduced, except in full, without the written approval of Rhein Tech Laboratories, Inc. and Protective Systems Inc. The test results reported relate only to the item tested.

Table of Contents

1	General Information	4
1.1	Scope	4
1.2	Modifications.....	4
1.3	Test Facility	4
1.4	Related Submittal(s)/Grant(s)	4
2	Test Information	5
2.1	Test Justification	5
2.2	Test Result Summary	5
2.3	Test System Details.....	5
2.4	Configuration of Tested System	6
3	Frequency Measurements (MP-5 3.2, Part 18.301)	7
4	Radiated Emissions (MP-5 5.0, FCC Part 18.305)	8
4.1	Radiated Emissions Test Data	8
5	Conducted Powerline Measurements/Conduction Limits (MP-5 7.0, Part 18.307)	10
6	Conclusion.....	10

Table Index

Table 2-1:	Test Result Summary with FCC Rules and Regulations	5
Table 2-2:	Equipment Under Test (EUT).....	5
Table 3-1:	Frequency Measurement Test Equipment	7
Table 4-1:	Power – In Band	8
Table 4-2:	Radiated Emissions Test Data – Out of Band.....	8
Table 4-3:	Radiated Emissions Test Equipment	9

Figure Index

Figure 2-1:	Configuration of System under Test.....	6
-------------	---	---

Appendix Index

Appendix A:	FCC/TCB Agency Authorization Letter	11
Appendix B:	FCC Confidentiality Request Letter	12
Appendix C:	ID Label and Label Location	13
Appendix D:	Operational Description	14
Appendix E:	Schematics	15
Appendix F:	Block Diagram	16
Appendix G:	Manual.....	17
Appendix H:	Test Photographs	18
Appendix I:	External Photographs	20
Appendix J:	Internal Photographs	21

Photograph Index

Photograph 1:	Configuration of System under Test.....	6
Photograph 2:	Radiated Emissions – Front	18
Photograph 3:	Radiated Emissions – Rear	19

1 General Information

1.1 Scope

FCC Part 18: Industrial, Scientific, and Medical Equipment (10-01-07)

1.2 Modifications

The manufacturer lowered the RF power in order to comply with the out of band field strength limits of Part 18.305.

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Rhein Tech Laboratories, Inc. (RTL), 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.4 Related Submittal(s)/Grant(s)

This is an original certification report for Protective Systems Inc. Model EMR100, FCC ID: WSK-EMR100.

2 Test Information

2.1 Test Justification

The purpose of this test report is to show compliance of the EMR100 (the EUT) to FCC Part 18 requirements. As the EUT can potentially be used in any environment (including residential), it is being classified as a consumer ISM device subject to the FCC certification procedure as defined by FCC Part 18.203(a) and 2.907.

The EUT operates at the ISM frequency of 2,450 MHz as defined by Part 18.301.

2.2 Test Result Summary

Table 2-1: Test Result Summary with FCC Rules and Regulations

Procedure/Standard	Test	Pass/Fail or N/A
MP-5 3.2	Frequency Measurements	Pass
MP-5 5.0, Part 18.305	Radiated Emissions	Pass
MP-5 7.0, Part 18.307	Conducted Powerline Measurements	N/A – battery operated

2.3 Test System Details

The test sample was received by RTL on October 17, 2008. The FCC Identifier for the equipment is shown in the following table.

Table 2-2: Equipment Under Test (EUT)

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description
Time Domain Reduction System	Protective Systems	EMR100	N/A	WSK-EMR100	N/A

2.4 Configuration of Tested System



Photograph 1: Configuration of System under Test


3 Frequency Measurements (MP-5 3.2, Part 18.301)

The frequency measurement procedure in MP-5 3.2 was used to determine the minimum and maximum frequency of operation. The EUT was found to stay within the allowed frequency band of 2,400 – 2,500 MHz specified by Part 18.301.

Table 3-1: Frequency Measurement Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	7/31/09

Test Personnel:



Daniel Baltzell
EMC Test Engineer

Signature

October 17, 2008
Date of Test

4 Radiated Emissions (MP-5 5.0, FCC Part 18.305)

Radiated emissions were tested per the procedure in MP-5 5.0 against the limits specified in FCC Part 18.305. Since the EUT operates on an ISM frequency of 2,450 MHz, the limits in the first line of the first table in 18.305 apply for the out of band emissions. Additionally, since the EUT is operating on an ISM frequency as specified in Part 18.301, there is no limit to the in-band emissions.

Radiated emissions were measured at a distance of 10 m, and the emission was converted to an equivalent level to compare to the limit at 300 m using an attenuation factor of 1/d as specified in the second paragraph of MP-5 2.2.6 and 18.305 Note 2.

Only data within 20 dB of the limit is being reported as specified in MP-5 5.6.

4.1 Radiated Emissions Test Data

Table 4-1: Power – In Band

Frequency (MHz)	Analyzer Level (dBuV)	Site Correction Factor (dB/m)	Corrected (dBuV/m)	Power (W)**
2486.2	90.4	30.1	120.5	3.7

measurement distance = 10 m, RBW = 1 MHz, VBW = 10 Hz

** power calculated using $P = (\text{Field Strength} \cdot d)^2 / 30$

Table 4-2: Radiated Emissions Test Data – Out of Band

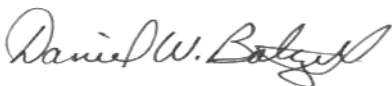
Frequency (MHz)	Analyzer Level (dBuV)	Site Correction Factor (dB/m)	Corrected to 300 meter (dBuV/m)	Limit (dBuV/m)	Margin (dB)
12435.8	44.3	8.4	9.8	28.0	-18.2
14920.4	39.7	10.6	9.3	28.0	-18.7
17405.0	33.2	16.5	10.9	28.0	-17.1
19889.6	28.2	20.0	12.8	28.0	-15.2
22374.1	22.4	29.4	15.3	28.0	-12.7
24858.7	24.2	29.4	25.8	28.0	-2.2

measurement distance = 10 m, RBW = 1 MHz, VBW = 10 Hz

Table 4-3: Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901365	MITEQ	JS4-00102600-41-5P	Amplifier, 0.1-26 GHz, 30dB gain	N/A	10/8/09
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	7/31/09
901425	Insulated Wire Inc.	KPS-1503-2400-KPS	RF cable, 20'	NA	10/08/09
901424	Insulated Wire Inc.	KPS-1503-360-KPS	RF cable 36"	NA	10/08/09
900772	EMCO	3161-02	Horn Antenna (2-4 GHz)	9804-1044	6/14/10
900321	EMCO	3161-03	Horn Antenna (4.0-8.2 GHz)	9508-1020	6/14/10
900323	EMCO	3160-07	Horn Antenna (8.2-12.4 GHz)	9605-1054	6/14/10
900356	EMCO	3160-08	Horn Antenna (12.4-18 GHz)	9607-1044	6/14/10
900325	EMCO	3160-9	Horn Antennas (18-26.5 GHz)	9605-1051	6/14/10
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz-2 GHz)	2648	12/20/08

Test Personnel:

Daniel Baltzell		October 17, 2008
EMC Test Engineer	Signature	Date of Test

5 Conducted Powerline Measurements/Conduction Limits (MP-5 7.0, Part 18.307)

N/A – EUT is battery operated only.

6 Conclusion

The data in this measurement report shows that Protective Systems Inc. Model EMR100; FCC ID: WSK-EMR100, complies with all the applicable requirements of Parts 2 and 18 of the FCC Rules.