



Engineering and Testing for EMC and Safety Compliance



Accredited under A2LA Testing Certificate # 2653.01

Certification Report FCC Part 18

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|--|---|--|---------------------|
| 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: Desmond A. Fraser

Date: October 27, 2008

Typed/Printed Name: Desmond A. Fraser

Position: President

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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 |

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Model: EMR100
Standard: FCC Part 18
FCC ID: WSK-EMR100
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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 |

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

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

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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
 EMC Test Engineer



Signature

October 17, 2008
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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.