COMPLIANCE WORLDWIDE INC
TEST REPORT 150-06

In Accordance with the Requirements of

Industry Canada RSS 210, Issue 6, Annex 1
Federal Communications Commission CFR Title 47 Part 15.209, Subpart C

issued to

TYCO Software House
70 Westview Street
Lexington, MA 02421 USA
(781) 768 0205

for

RM2L-PH
Proximity Card Reader with Keypad and LCD Display

FCC ID: SZC-PH
IC: 5690A-PH

on

March 31, 2006

Brian F. Breault

Reviewed by

Larry K. Stillings

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1. Test Description

1.1 Test Objective

To test the RM2L-PH to **FCC 15.209 and RSS 210 r**equirements and detail the results in a test report.

1.2 E.U.T. Description

General: The RM2L- PH is an access control user interface that includes a keypad, LCD display and RF proximity card reader.

Serial Number: Pre-production unit

2. Test Results and Conclusions

2.1 Product Tested – Proximity Card Reader with keypad and LCD

2.2 Model Number - RM2L-PH

2.3 Radiated Emissions Test Results

The test results conclude that the emissions radiated from this equipment are in compliance with the FCC 15.209 and RSS 210 Annex 1 Rules.

2.4 Conducted Emissions Test Results

The test results show that the emissions conducted through the power line from this equipment are in compliance with the FCC 15.209 and RSS 210 Annex 1 Rules.

2.5 Analysis and Conclusions

Based upon the radiated and conducted measurements we find that this equipment is within the limits of the FCC 15.209 and RSS 210 Annex 1 Rules. All results are based on a test of one sample, and represent other production units; only in as much as a sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

2.6 Notes (Special conditions unique to this test)

None

3. Test Equipment and Test Procedures

3.1 Measurement Equipment

Device	Manufacturer	Model	Serial #	Cal. Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	1/5/2007
Loop Antenna	EMCO	6502	2197	3/16/2008
Temp. Meter	Fluke	187	4804030	3/14/2007
Biconilog Antenna	Com-Power	AC220	25509	7/11/2006
LISN	EMCO	EM 3825/2	9109-1860	12/15/2006

All equipment used for testing has been calibrated according to the methods and procedures defined by the National Institute of Standards and Technology (NIST).

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3.2 Frequency Range to Be Scanned.

A. Radiated emissions Test from 100 kHz to 30 MHz.

B. Conducted emissions Test from 150 kHz to 30 MHz.

3.3 Radiated Emissions Test Procedures.

The EUT, associated cables and peripheral devices are placed on an 80 cm high table. Any support equipment is configured remotely. The EUT is powered on and given a sufficient amount of time to achieve thermal stability. Any necessary operating or test software is installed. The EUT is first pre-scanned in a semi-anechoic chamber where it is rotated 360 degrees and examined in both horizontal and vertical antenna polarities. All emissions within the required frequency bands are identified and recorded. The EUT is then relocated to the open area test site. The required frequency bands are again investigated and all frequencies identified in the chamber are revisited. For each emission, the turntable is rotated 360 degrees to determine the position at which the emission maximizes. At the maximized turntable position, the antenna height is varied from 1 to 4 meters to determine the antenna position at which the maximum level occurs. In this manner, both vertical and horizontal antenna polarities are measured and recorded. When necessary, the EUT cables are repositioned to determine if they have an effect on the level of the emission.

3.4 Conducted Emissions Test Procedure:

The power line of the EUT is connected to a Line Impedance Stabilization Network (LISN). Emissions conducted onto the power line by the EUT are measured in the frequency range from 150 kHz to 30 MHz. Both phase (L1) and neutral (L2) are investigated and the maximum readings are recorded.

All measurements are made according to the procedures defined in: "ANSI C63.4-2003 Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz, American National Standard for (ISBN 1-55937-215-5).

4. FCC 15.209 & IC RSS 210 Annex 1 Test Limits

4.1 Class C Radiated Emissions Limits:

Frequency MHz	Distance meters	Limit dBµV/m	Limit µV/m
0.009 – 0.490	300	20 Log (2400/F)	2400/F (kHz) Avg
0.490 – 1.705	30	20 Log (24000/F)	24000/F (kHz)
1.705 - 30	30	29.5	30
30 – 88	3	40.0	100
88 – 216	3	43.5	150
216 – 960	3	46.0	200
960 and above	3	54.0	500

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4.2. FCC Part 15 Conducted Emissions Limits (Quasi-Peak)

Frequency MHz	Quasi-Peak Limit dBµV	Average Limit dBµV
0.150 - 0.500	66 to 56	56 to 46
0.500 - 5.0	56	46
5.0 - 30.0	60	50

5. Test Facility Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC), Industry Canada, and Voluntary Control Council Interference (VCCI) standards. A description of the test sites is on file with the FCC (registration number 96392), Industry Canada (file number IC 3023), and VCCI (member number 2147, registration numbers C-1987 and R-1856.

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or table top.

6. Product Identification

Product Tested: Proximity Card Reader with Keypad and LCD Display

Model Number: RM2L- PH

Serial Number: Pre-production unit

Input power: Supplied by the Access Controller (C Cure apC/8X)

Application Software: C-Cure System Generator
C-Cure System Monitor

Additional Notes: A motorized unit with two cards attached was used to force the RM2L-PH to make continuous reads.

Support Equipment:

Description	Manufacturer	Model	Serial No.
Access Controller	Tyco Software House	C Cure apC/8X	N/A
Notebook Computer	Dell	Inspiron 7000	N/A

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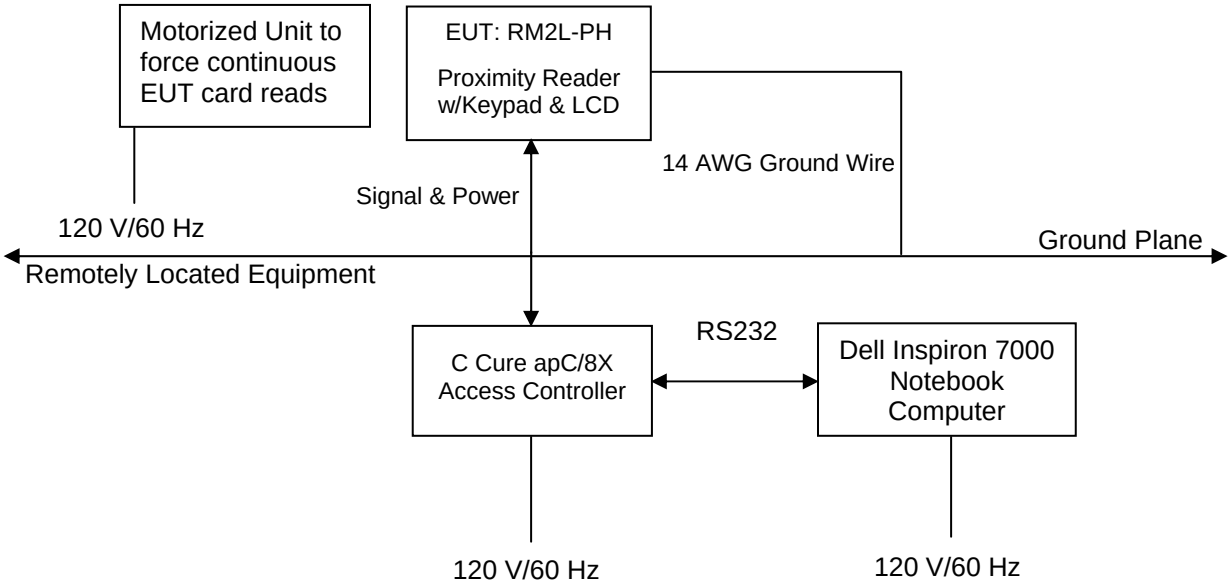
Cables:

Cable	From	To	Length	Shielded
14 AWG Ground Wire	EUT	Ground Plane	1 Meter	No
Signal and Power	EUT	C Cure apC/8X	5 Meters	Yes
RS232	C Cure apC/8X	Notebook Computer	1 Meter	Yes

Block Diagram:



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7. Test Measurements and Results

7.1 Radiated Emissions Test Results

Frequency Range:	.009 - 1000 MHz.
Measurement Distance:	1.0 Meter.
Bandwidth:	ANSI C63.4-2003.* Requirement for Selected Range
Detector Functions:	Peak
Video Filter:	Auto for Selected Range
Table Height:	0.8 meters
Antenna Height Variation:	1 Meter.

7.1.1 Worst Case Radiated Data and Transmitter Output Power

Freq. (MHz)	Azimuth (Degrees)	Antenna Height (Meters)	Polarity (H/V)	Distance (Meters)	Peak Amplitude (dBµV/m)	QP Amplitude (dBµV/m)	Limit (dBµV)	Margin (dB)
.12734[1]	10	1.0	V	1	105.54	N/M	124.6[2]	-19.0
.25357	10	1.0	V	1	68.13	N/M	118.6[2]	-50.5
.38440	10	1.0	V	1	65.92	N/M	115.0[2]	-49.1
.51083	10	1.0	V	1	66.60	N/M	92.5[2]	-25.9
.64198	10	1.0	V	1	57.88	N/M	90.5[2]	-32.7
.76003	10	1.0	V	1	47.70	N/M	89.1[2]	-41.4
.89357	10	1.0	V	1	62.93	N/M	87.7[2]	-24.7
1.03102	10	1.0	V	1	72.33	N/M	86.4[2]	-14.1
1.15257	10	1.0	V	1	49.00	N/M	85.5[2]	-36.5
1.27821	10	1.0	V	1	42.71	N/M	84.6[2]	-41.8

[1]Fundamental Transmitter output.
[2]Limit is extrapolated at 40 dB per decade.

7.2 Conducted Emissions Test Results

Frequency Range:	150 kHz to 30.0 MHz.
Bandwidth:	9 kHz per ANSI C63.4-2003.
Detector Functions:	Peak, Quasi-Peak, Average
Table Height:	0.8 meters
Video Bandwidth:	30 kHz.

Phase and Neutral (L1 & L2) Measurements Taken.

Please see the following pages for conducted emissions test data.

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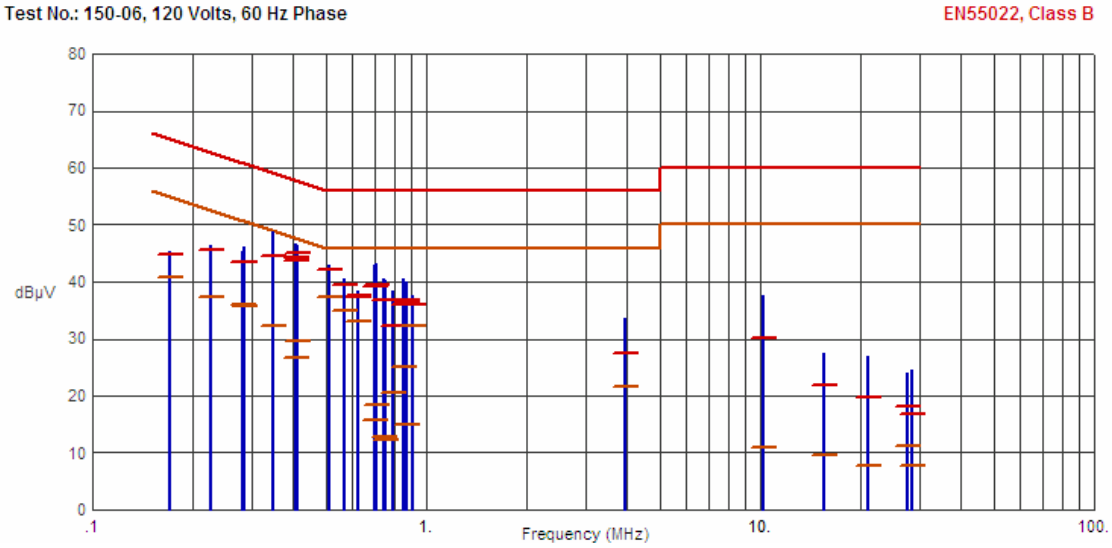
7.2.1 120 Volts, 60 Hz Phase



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1700	45.44	44.81	64.96	-20.15	40.82	54.96	-14.14	
.1705	45.40	44.71	64.94	-20.23	40.71	54.94	-14.23	
.2262	46.49	45.50	62.59	-17.09	37.31	52.59	-15.28	
.2832	45.38	43.34	60.72	-17.38	36.09	50.72	-14.63	
.2838	46.16	43.56	60.70	-17.14	35.80	50.70	-14.90	
.3481	48.67	44.43	59.01	-14.58	32.36	49.01	-16.65	
.4067	46.23	43.81	57.72	-13.91	26.69	47.72	-21.03	
.4081	46.60	44.40	57.69	-13.29	26.54	47.69	-21.15	
.4119	46.47	45.14	57.61	-12.47	29.68	47.61	-17.93	
.5110	42.92	42.17	56.00	-13.83	37.46	46.00	-8.54	
.5675	40.45	39.37	56.00	-16.63	34.87	46.00	-11.13	
.6243	38.45	37.43	56.00	-18.57	33.04	46.00	-12.96	
.6248	38.43	37.50	56.00	-18.50	33.13	46.00	-12.87	
.7010	43.05	39.12	56.00	-16.88	15.68	46.00	-30.32	
.7113	43.12	39.58	56.00	-16.42	18.41	46.00	-27.59	
.7487	40.43	36.80	56.00	-19.20	12.79	46.00	-33.21	
.7573	40.17	36.79	56.00	-19.21	12.27	46.00	-33.73	
.7957	38.40	32.28	56.00	-23.72	20.55	46.00	-25.45	
.8571	40.60	35.95	56.00	-20.05	25.04	46.00	-20.96	
.8714	40.01	36.76	56.00	-19.24	14.80	46.00	-31.20	
.8727	39.93	36.63	56.00	-19.37	14.83	46.00	-31.17	
.9118	37.63	35.89	56.00	-20.11	32.25	46.00	-13.75	
3.9581	33.67	27.50	56.00	-28.50	21.70	46.00	-24.30	
10.2611	37.49	30.11	60.00	-29.89	10.92	50.00	-39.08	
15.5855	27.38	21.83	60.00	-38.17	9.53	50.00	-40.47	
21.0537	27.01	19.74	60.00	-40.26	7.82	50.00	-42.18	
27.5158	23.96	18.00	60.00	-42.00	11.09	50.00	-38.91	
28.5451	24.56	16.68	60.00	-43.32	7.83	50.00	-42.17	

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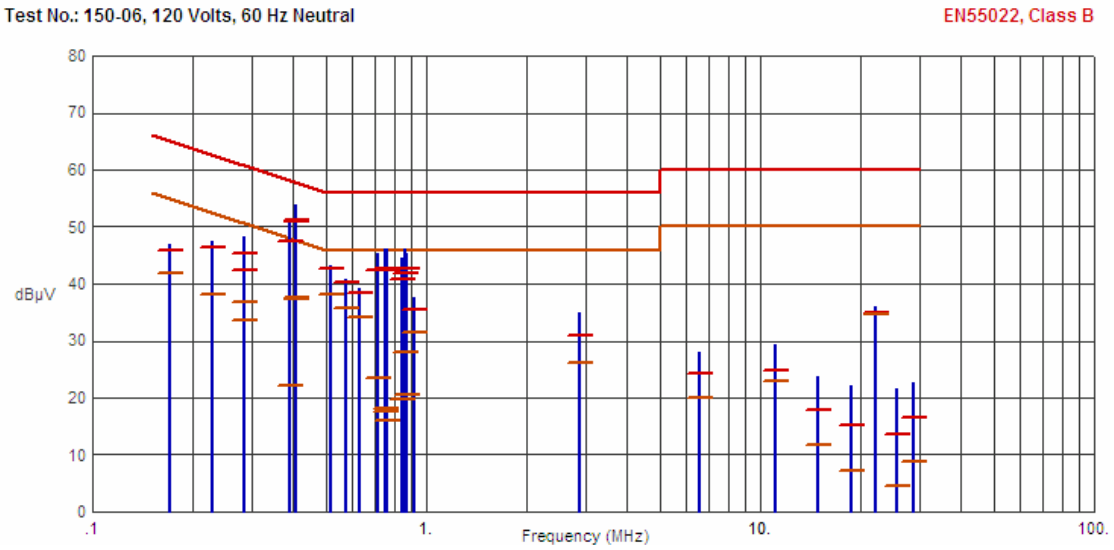
7.2.2 120 Volts, 60 Hz Neutral



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1713	47.02	45.88	64.90	-19.02	41.96	54.90	-12.94	
.2287	47.55	46.53	62.50	-15.97	38.15	52.50	-14.35	
.2834	44.81	42.39	60.72	-18.33	33.55	50.72	-17.17	
.2856	48.26	45.38	60.65	-15.27	36.87	50.65	-13.78	
.3889	51.25	47.34	58.09	-10.75	22.01	48.09	-26.08	
.4046	53.75	51.05	57.76	-6.71	37.57	47.76	-10.19	
.4055	53.81	51.23	57.74	-6.51	37.24	47.74	-10.50	
.5152	43.32	42.70	56.00	-13.30	38.01	46.00	-7.99	
.5729	40.92	40.17	56.00	-15.83	35.75	46.00	-10.25	
.6299	39.31	38.43	56.00	-17.57	34.10	46.00	-11.90	
.7125	45.37	42.40	56.00	-13.60	23.36	46.00	-22.64	
.7546	46.26	42.60	56.00	-13.40	18.16	46.00	-27.84	
.7574	46.11	42.52	56.00	-13.48	17.61	46.00	-28.39	
.7604	46.04	42.36	56.00	-13.64	16.02	46.00	-29.98	
.8501	44.52	40.68	56.00	-15.32	19.61	46.00	-26.39	
.8616	46.09	41.89	56.00	-14.11	27.98	46.00	-18.02	
.8729	45.33	42.79	56.00	-13.21	20.52	46.00	-25.48	
.9196	37.53	35.47	56.00	-20.53	31.51	46.00	-14.49	
2.8744	34.86	30.88	56.00	-25.12	26.15	46.00	-19.85	
6.6084	28.04	24.36	60.00	-35.64	20.07	50.00	-29.93	
11.0643	29.32	24.82	60.00	-35.18	22.95	50.00	-27.05	
14.8325	23.67	17.96	60.00	-42.04	11.86	50.00	-38.14	
18.7974	22.20	15.23	60.00	-44.77	7.27	50.00	-42.73	
22.1248	36.01	34.83	60.00	-25.17	34.66	50.00	-15.34	
25.6142	21.68	13.56	60.00	-46.44	4.54	50.00	-45.46	
28.8311	22.70	16.51	60.00	-43.49	8.77	50.00	-41.23	

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8. Photographs

8.1 Radiated Emissions Test Setup.

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8.2 Conducted Emissions Test Setup.

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