COMPLIANCE WORLDWIDE INC
TEST REPORT 153-06

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

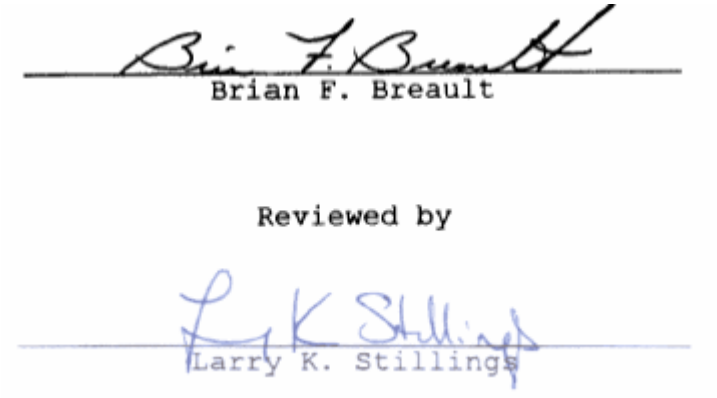
for

RM2L-PI37
Proximity Card Reader with Keypad and LCD Display

FCC ID: SZC-PI37
IC: 5690A-PI37

on

March 31, 2006



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http://www.cw-inc.com

1. Test Description

1.1 Test Objective

To test the RM2L-PI37 to **FCC 15.209 and RSS 210** requirements and detail the results in a test report.

1.2 E.U.T. Description

General: The RM2L- PI37 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-PI37

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.

2.6 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.

2.7 Notes (Special conditions unique to this test)

None

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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
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).

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).

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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

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.

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6. Product Identification

Product Tested: Proximity Card Reader with Keypad and LCD Display

Model Number: RM2L-PI37

Serial Number:

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-PI37 to make continuous reads.

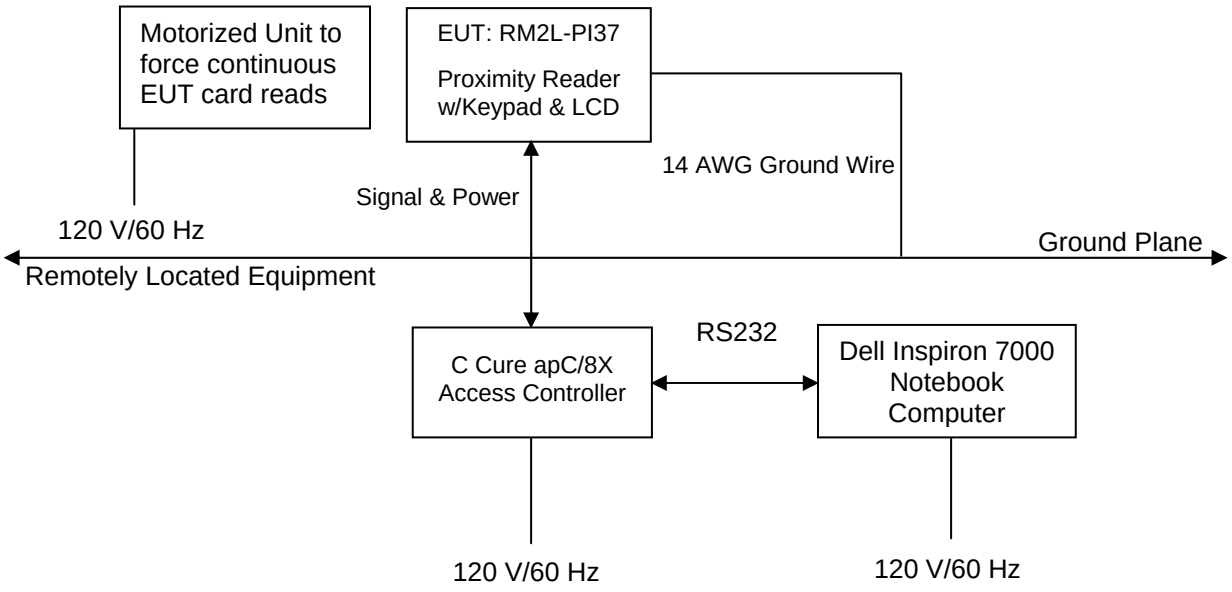
Support Equipment:

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

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)
.12457[1]	10	1.0	V	1	102.90	N/M	124.8[2]	-21.9
.25070	10	1.0	V	1	56.75	N/M	118.7[2]	-61.9
.38400	10	1.0	V	1	53.43	N/M	115.0[2]	-61.6
.50045	10	1.0	V	1	53.92	N/M	92.7[2]	-38.8
.62622	10	1.0	V	1	55.78	N/M	90.7[2]	-35.0
.74888	10	1.0	V	1	58.91	N/M	89.2[2]	-30.3
.87464	10	1.0	V	1	57.24	N/M	87.9[2]	-30.6
.99758	10	1.0	V	1	51.77	N/M	86.7[2]	-34.9
1.11623	10	1.0	V	1	55.77	N/M	85.7[2]	-29.9
1.24888	10	1.0	V	1	56.61	N/M	84.8[2]	-28.1

[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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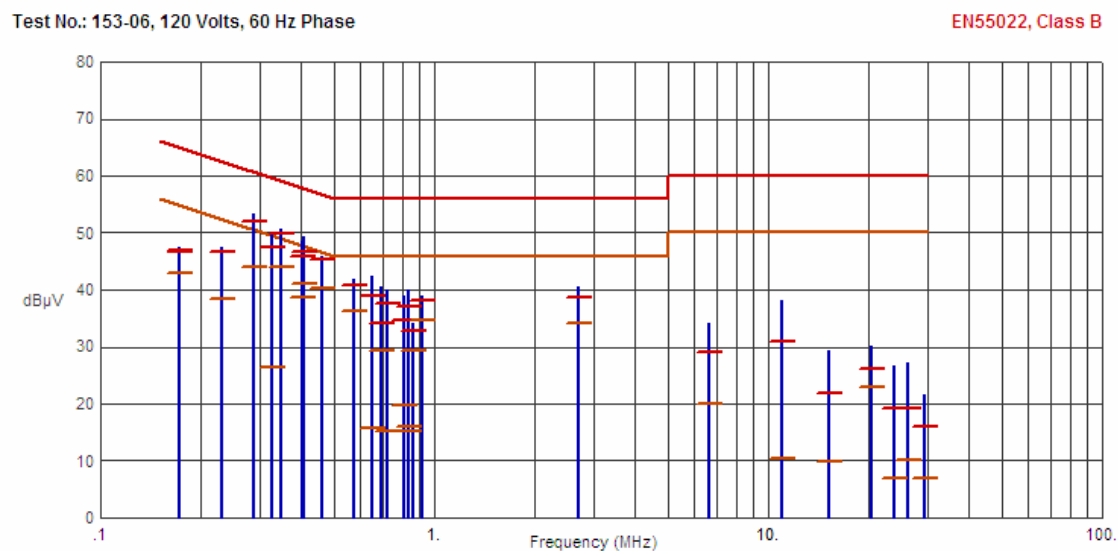
7.2.1 120 Volts, 60 Hz Phase



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1723	47.57	46.77	64.85	-18.08	42.83	54.85	-12.02	
.1724	47.57	46.81	64.84	-18.03	42.85	54.84	-11.99	
.2303	47.47	46.71	62.44	-15.73	38.50	52.44	-13.94	
.2885	53.26	51.90	60.57	-8.67	43.88	50.57	-6.69	
.3259	49.73	47.57	59.56	-11.99	26.51	49.56	-23.05	
.3470	50.69	49.82	59.03	-9.21	43.94	49.03	-5.09	
.4008	48.59	45.76	57.84	-12.08	38.74	47.84	-9.10	
.4047	49.46	46.72	57.76	-11.04	41.15	47.76	-6.61	
.4615	45.89	45.29	56.67	-11.38	40.28	46.67	-6.39	
.5760	41.94	40.77	56.00	-15.23	36.28	46.00	-9.72	
.6522	42.52	38.80	56.00	-17.20	15.76	46.00	-30.24	
.6904	40.49	34.23	56.00	-21.77	29.22	46.00	-16.78	
.7215	40.01	37.65	56.00	-18.35	15.32	46.00	-30.68	
.8109	38.87	34.62	56.00	-21.38	19.76	46.00	-26.24	
.8341	39.89	37.14	56.00	-18.86	15.28	46.00	-30.72	
.8350	39.99	37.16	56.00	-18.84	15.88	46.00	-30.12	
.8661	34.10	32.82	56.00	-23.18	29.43	46.00	-16.57	
.9243	39.05	38.22	56.00	-17.78	34.57	46.00	-11.43	
2.7162	40.41	38.58	56.00	-17.42	34.13	46.00	-11.87	
6.6462	34.00	28.95	60.00	-31.05	20.06	50.00	-29.94	
11.0185	38.09	31.01	60.00	-28.99	10.40	50.00	-39.60	
15.2620	29.43	21.96	60.00	-38.04	9.95	50.00	-40.05	
20.2787	30.18	26.23	60.00	-33.77	23.06	50.00	-26.94	
23.8550	26.74	19.24	60.00	-40.76	7.02	50.00	-42.98	
26.1902	27.31	19.15	60.00	-40.85	10.10	50.00	-39.90	
29.2549	21.71	16.08	60.00	-43.92	6.87	50.00	-43.13	

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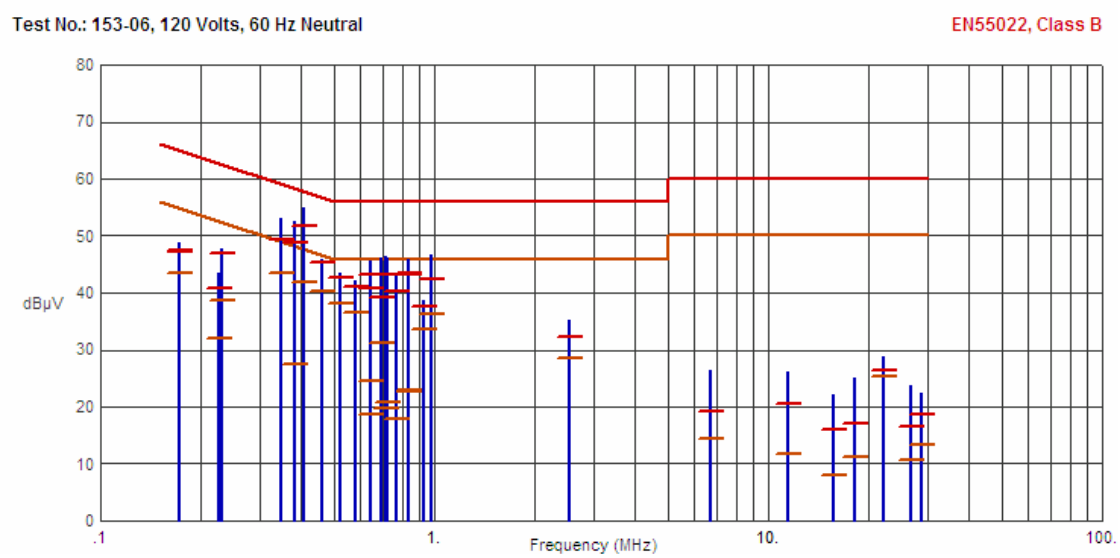
7.2.2 120 Volts, 60 Hz Neutral



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1727	48.86	47.30	64.83	-17.53	43.37	54.83	-11.46	
.1729	48.83	47.35	64.82	-17.47	43.42	54.82	-11.40	
.2268	43.56	40.78	62.57	-21.79	32.13	52.57	-20.44	
.2311	47.84	47.03	62.41	-15.38	38.54	52.41	-13.87	
.3460	53.06	49.35	59.06	-9.71	43.34	49.06	-5.72	
.3831	52.65	48.93	58.21	-9.28	27.40	48.21	-20.81	
.4054	54.77	51.63	57.74	-6.11	41.84	47.74	-5.90	
.4059	54.81	51.84	57.73	-5.89	41.78	47.73	-5.95	
.4625	45.85	45.24	56.65	-11.41	40.23	46.65	-6.42	
.5204	43.55	42.78	56.00	-13.22	38.17	46.00	-7.83	
.5792	42.23	40.98	56.00	-15.02	36.47	46.00	-9.53	
.6422	41.55	40.92	56.00	-15.08	24.57	46.00	-21.43	
.6475	45.60	43.31	56.00	-12.69	18.62	46.00	-27.38	
.6946	46.05	39.23	56.00	-16.77	31.17	46.00	-14.83	
.7163	46.42	43.25	56.00	-12.75	19.77	46.00	-26.23	
.7241	46.15	43.12	56.00	-12.88	20.84	46.00	-25.16	
.7732	43.32	40.22	56.00	-15.78	17.82	46.00	-28.18	
.8368	45.80	43.24	56.00	-12.76	22.59	46.00	-23.41	
.8391	45.77	43.46	56.00	-12.54	23.01	46.00	-22.99	
.9248	38.55	37.60	56.00	-18.40	33.69	46.00	-12.31	
.9842	46.69	42.50	56.00	-13.50	36.32	46.00	-9.68	
2.5479	35.17	32.18	56.00	-23.82	28.61	46.00	-17.39	
6.7092	26.43	19.18	60.00	-40.82	14.53	50.00	-35.47	
11.4000	26.26	20.45	60.00	-39.55	11.69	50.00	-38.31	
15.6312	22.09	16.02	60.00	-43.98	7.90	50.00	-42.10	
18.1751	24.97	17.09	60.00	-42.91	11.18	50.00	-38.82	
22.1259	28.72	26.46	60.00	-33.54	25.40	50.00	-24.60	
26.7350	23.65	16.42	60.00	-43.58	10.70	50.00	-39.30	
28.8212	22.36	18.64	60.00	-41.36	13.23	50.00	-36.77	

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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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