

TEST REPORT

FROM



For

QI Systems, Inc.

SmartVend Console

Model: HHCP-U4 or HHPN-U4

TO

47 CFR 15 SubPart C:2006

Test Report Serial No.:
SL07021502-QIS-006/PCII

This report supersedes None

Remarks: Equipment complied with the specification Equipment did not comply with the specification

This Test Report is Issued Under the Authority of:

Kerwin Corpuz

.....
Tested by: Kerwin Corpuz, Test Engineer

Snell Leong

.....
Reviewed by: Snell Leong, Reviewer

Issue date: 18 May 2007

Manufacturer: QI Systems, Inc.



Registration No. 783147



Registration No. 4842



Lab Code: KR0032



RTA No. D23/16V



Registration No. 2195



Lab Code: US0160



BSMI Code: SL2-IN-E-1130R

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EUT: SmartVend Console
To: 47 CFR 15 SubPart C:2006

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Executive Summary

The purpose of this test programme was to demonstrate compliance of the QI Systems, Inc. previously granted limited modular approved RFID radio module (FCCID: U4BM210-3G) to installed into new host SmartVend Console, model HHCP-U4 or HHPN-U4 . The SmartVend Console demonstrated compliance with the 47 CFR 15 SubPart C:2006.

The difference between the two hosts is the firmware. These models affect the protocol sent over the communications cable and have no effect on the RF module communication.

QI Systems, Inc. is the applicant and claimed manufacturer of this tested product. For the detailed description of this product, please refer to the SmartVend Console User Manual.

Highest clock being generated with both systems: 13.56 MHz. On-Board clock is 5.57 MHz.

The test has demonstrated that this unit complies with stipulated standards.

1 Technical Details

Purpose	PCII to add new host (HHCP-U4 or HHPN-U4) to limited approved RFID radio module (FCCID: U4BM210-3G).
Applicant / Client	QI Systems, Inc. 101-3820 Jacombs Road Richmond, BC V6V1Y6 Canada
Manufacturer	QI Systems, Inc.
Laboratory performing the tests	SIEMIC Labs 2206 Ringwood Avenue San Jose, CA 95131
Test location(s)	SIEMIC Labs 2206 Ringwood Avenue San Jose, CA 95131
Test report reference number	SL07021502-QIS-006/PCII
Date EUT received	17 April 2007
Standard applied	47 CFR 15 SubPart C:2006
Dates of test (from – to)	18 April 2007 to 019 April 2007
No of Units:	1 of each devices
Equipment Category:	DXX
Trade/Product Name:	SmartVend Console
Type/Model Name/No:	HHCP-U4 or HHPN-U4
Technical Variants:	none
AC Input	120Vac, 60Hz

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2 Tests Required

The product was tested in accordance with the following specifications.

The test results recorded in this Test Report are exclusively referred to the tested sample(s).

Test Standard	Description	Pass / Fail
47 CFR 15 SubPart C:2006		
15.207	Conducted Limits	Pass
15.225	Radiated Emission Limits	Pass
ANSI C63.4: 2003		

Notes: Deviations to above standards are outlined in specific test sections if applicable.

Cable loss and external attenuation are compensated for in the measurement system when applicable.

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3 Measurements, Examinations and Derived Results

3.1 General observations

Equipment serial number(s)		
EUT:	Model number:	Serial number:
SmartVend Console	HHCP-U4 or HHPN-U4	none

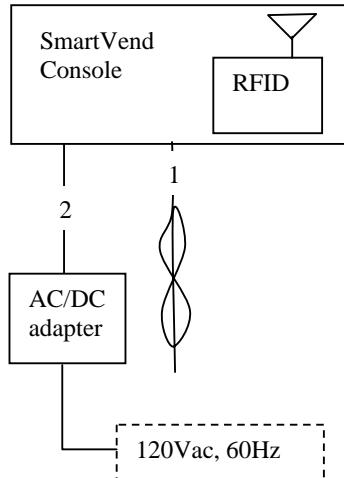


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3.2 Test Configuration



EUT Cabling Information:

Cable #	Type of Cable	Connector Type	Length (m)	Shield (Y/N)	Remark
1	Serial	RJ45/DB9	2	No	Dummy Cable
2	AC cord	Standard 3 prong	2	No	Connected to outlet

Support Equipment:

Type of Equipment	Manufacturer	Model
N/A	N/A	N/A

3.3 Test Results

3.3.1 Conducted Emissions Voltage

Requirement(s): 47 CFR §15.207

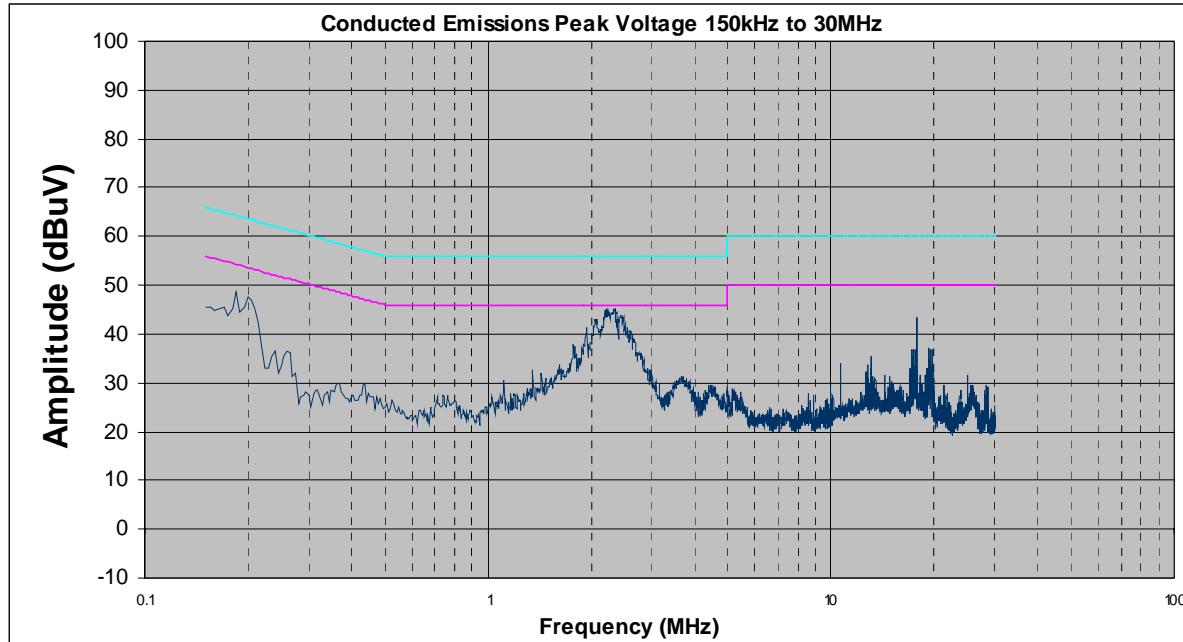
Procedures:

The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table. The power supply for the EUT was fed through a $50\Omega/50\mu\text{H}$ EUT LISN, connected to filtered mains. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. All other supporting equipment were powered separately from another mains.

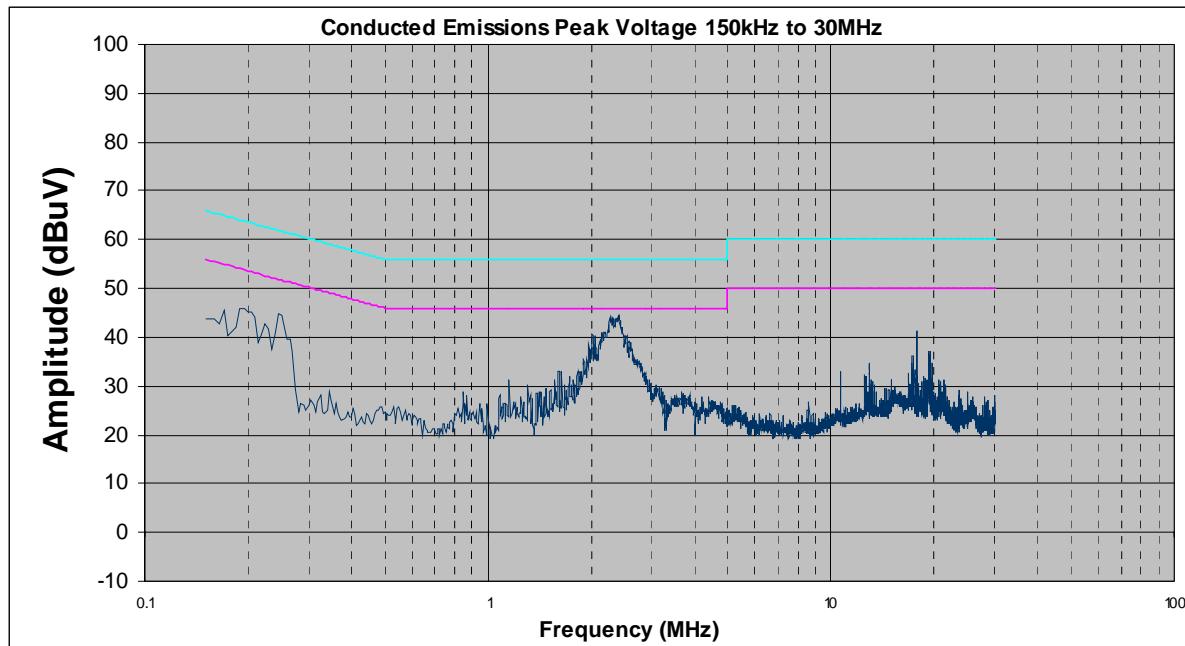
The EUT's Antenna was terminated and unit was switched on and allowed to warm up to its normal operating condition. A scan was made on the NEUTRAL line over the required frequency range using an EMI test receiver. High peaks, relative to the limit line, were then selected. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz. Quasi-peak and Average measurements were made. The procedure was then repeated for the PHASE line.

Results:

Note – Quasi-Peak Limit Average Limit



Neutral Line Plot at 120Vac, 60Hz



Phase Line Plot at 120Vac, 60Hz

LINE	FREQ (MHz)	Corrected Amplitude (dB μ V) PK	Limit (dB μ V) QP	Margin (dB) QP	Corrected Amplitude (dB μ V) PK	Limit (dB μ V) AVG	Margin (dB) AVG
Neutral	0.25	44.59	61.76	-17.17	42.25	51.76	-9.51
Neutral	2.39	43.91	56	-12.09	41.87	46	-4.13
Neutral	17.86	41.09	60	-18.91	39.46	50	-10.54
Phase	0.185	48.59	64.26	-15.13	45.13	54.26	-9.13
Phase	2.31	45.91	56	-10.09	41.66	46	-4.34
Phase	17.86	43.29	60	-16.71	40.21	50	-9.29

Conducted Emission Table

Note: PK = peak; QP = quasi-peak; AVG = average detector.

Tested By: Kerwinn Corpuz

Date Tested: 08 May 2007

3.3.2 Radiated Emissions

Requirement(s): 47 CFR §15.225

Procedures: Radiated emissions were measured according to ANSI C63.4. The EUT was set 3 meter away from the measuring antenna. It's radiated emissions frequency profile was observed using a spectrum analyzer. The measuring bandwidth was set to 100 kHz. Investigation was made with vertical and horizontal antenna polarization.

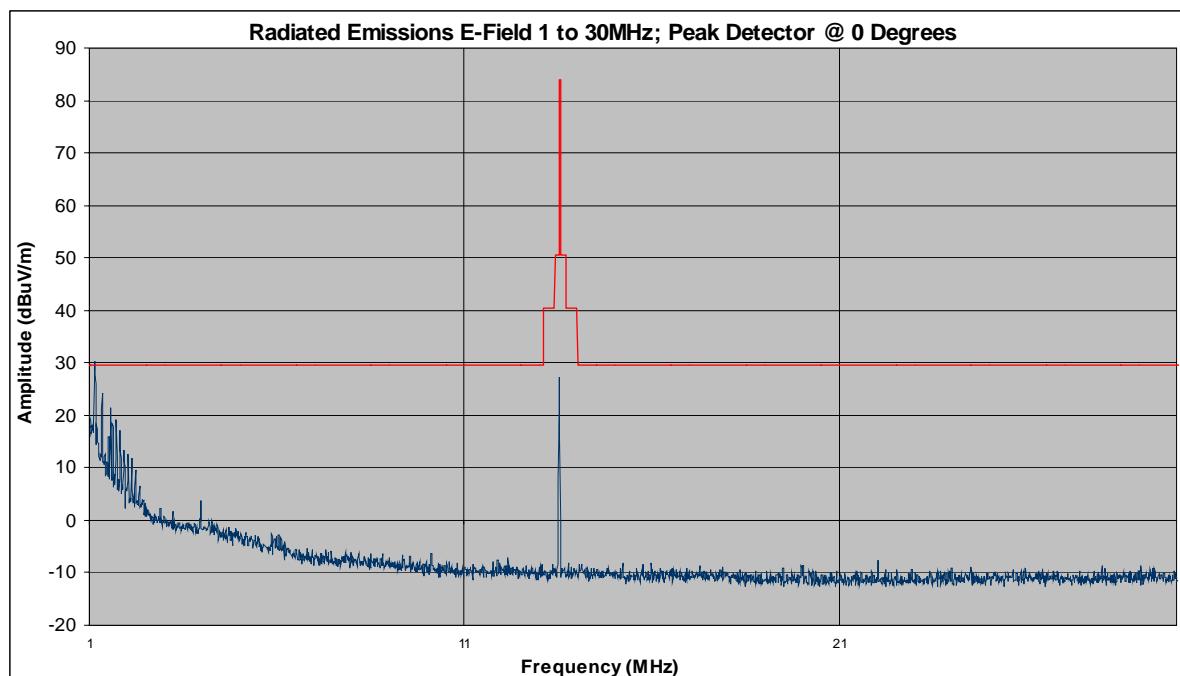
The limit is converted from microvolts/meter to decibel microvolts/meter.

Distance Correction Factor was calculated with 20 dB/decade.

Sample Calculation: Corrected Amplitude = Raw Amplitude(dB μ V/m) + ACF(dB) + Cable Loss(dB) – Distance Correction Factor

Note: Preliminary Test was done with X, Y, and Z Axis and submitted the worse case scenario.

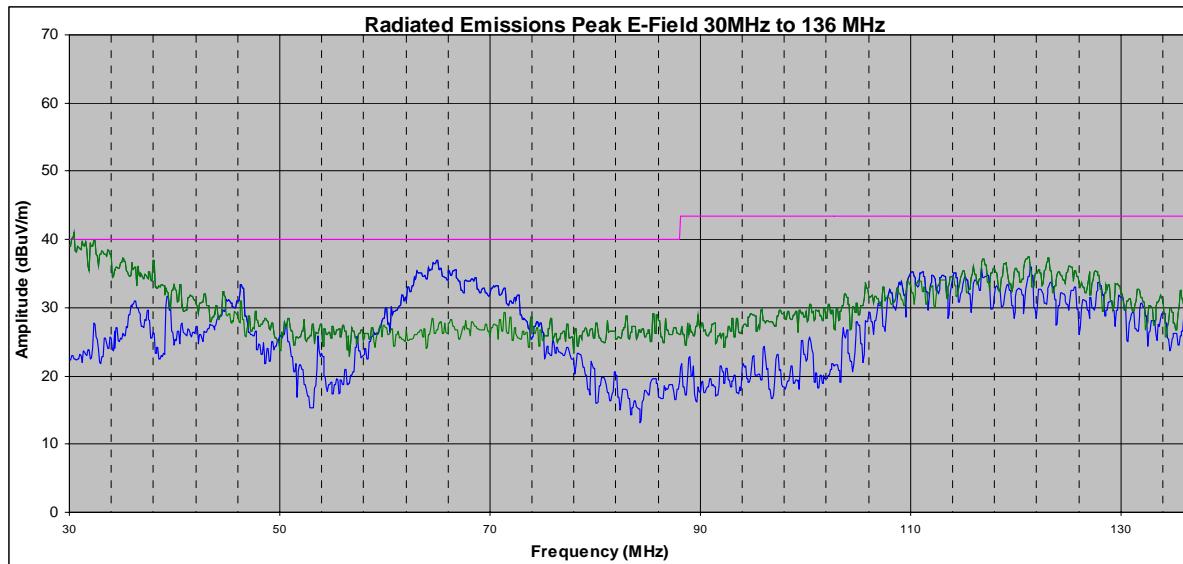
Results: Emission < 30Mhz



Frequency	Azimuth	Detector	Antenna Polarization	Antenna Height	Raw Amplitude @ 3m	Antenna Factor	Cable Loss	Distance Correction Factor	Corrected Amplitude @ 10m	Limit @ 30m	Margin
(MHz)	(degrees)	(qp/pk)	(H/V)	(m)	(dB μ V/m)	(dB)	(dB)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)
1.8	0	QP	V	1	45	59.9	0.25	40	24.65	29.54	-4.89

Emission 30MHz ~ 136MHz

Vertical Polarization Horizontal Polarization Limit



Radiated Emissions Plot

Frequency	Azimuth	Detector	Antenna Polarization	Antenna Height	Raw Amplitude @ 3m	Antenna Factor	Cable Loss	Distance Correction Factor	Corrected Amplitude @ 10m	Limit @ 10m	Margin
(MHz)	(degrees)	(qp/pk)	(H/V)	(m)	(dBµV/m)	(dB)	(dB)	(dB)	(dBµV/m)	(dBµV/m)	(dBµV/m)
31.26	100.00	QP	H	2.00	17.68	20.82	0.61	0	39.1	40.00	-0.90
65.14	90.00	QP	V	1.00	25.15	7.50	0.75	0	33.4	43.50	-10.10
119.10	135.00	QP	V	1.00	19.47	14.39	0.94	0	34.8	43.50	-8.70
119.10	110.00	QP	H	1.00	20.47	14.09	0.94	0	35.5	43.50	-8.00

Radiated Emissions Table

Tested By: Kerwinn Corpuz

Date Tested: 09 May 2007

4 TEST INSTRUMENTATION

4.1 TEST INSTRUMENTATION

Instrument	Manufacturer	Model	CAL Due Date
Spectrum Analyzer	HP	8568B	04/26/2008
Quasi-Peak Adapter	HP	85650A	04/26/2008
RF Pre-Selector	HP	85685A	04/26/2008
Spectrum Analyzer	HP	8564E	05/01/2008
EMI Receiver	Rohde&Schwarz	ESIB 40	05/07/2008
Biconlog Antenna	Sunol Sciences, Inc.	JB1	09/11/2007
Loop Antenna	ETS-Lingren	6512	05/13/2008
Near Field Probe	Chase	MFP9150	See Note
Chamber	Lingren	3m	08/21/2007
DMM	Fluke	73III	07/04/2007
Variac	KRM	AEEC-2090	See Note
Environment Chamber	TestEquity	1007H	01/24/2009
DMM	Fluke	73III	05/01/2008

Note: Functional Verification

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APPENDIX A: EUT TEST CONDITIONS

The following is the description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Cable Description
SmartVend Console	1. DC power

EUT Description : SmartVend Console
Model No : HHCP-U4 or HHPN-U4
Serial No : none

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
	The EUT was set to enter test mode automatically when powered.



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APPENDIX B: TEST SETUP PHOTOS

Please see attachment



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