SafeWorks, LLC

SafeWorks Pendant

Report No. SPID0004

Report Prepared By

www.nwemc.com
1-888-EMI-CERT

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EMC Test Report

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Last Date of Test: April 2, 2009

SafeWorks, LLC

Model: SafeWorks Pendant

Emissions			
Test Description	**Specification**	**Test Method**	**Pass/Fail**
Spurious Radiated Emissions	FCC 15.249:2009	ANSI C63.4:2003	**Pass**
Field Strength of Fundamental	FCC 15.249:2009	ANSI C63.4:2003	**Pass**
AC Powerline Conducted Emissions	FCC 15.207:2009	ANSI C63.4:2003	**Pass**

Modifications made to the product
See the Modifications section of this report

Test Facility

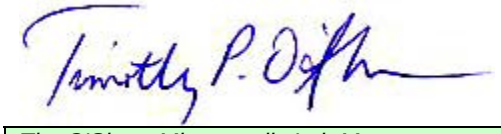
The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834D-1).

Approved By:



Tim O'Shea, Minneapolis Lab Manager

NVLAP

NVLAP Lab Code: 200630-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
00	None		

FCC: Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.

NVLAP: Northwest EMC, Inc. is accredited under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.

NVLAP LAB CODE 200629-0
NVLAP LAB CODE 200630-0
NVLAP LAB CODE 200676-0
NVLAP LAB CODE 200761-0

Industry Canada: Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS-Gen, Issue 2 and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2)*

CAB: Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.

NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).

Australia/New Zealand: The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).

VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. *(Registration Numbers. - Hillsboro: C-1071, R-1025, C-2687, T-289, and R-2318, Irvine: R-1943, C-2766, and T-298, Sultan: R-871, C-1784, and T-294).*

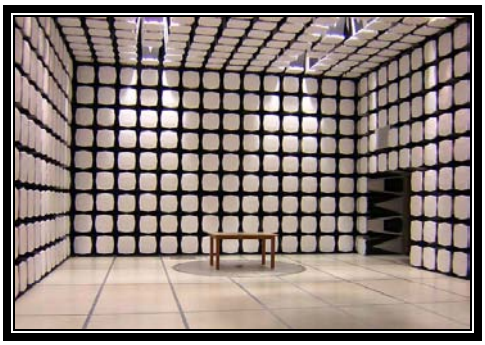
BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017). License No.SL2-IN-E-1017.

GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification

KCC: Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157)*

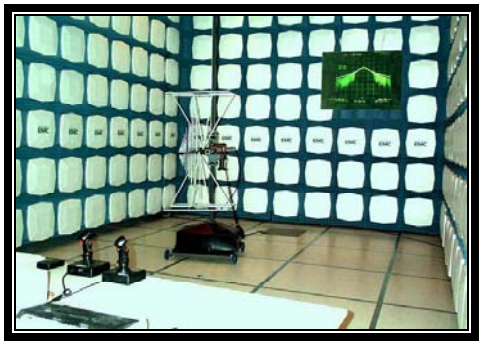
SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/



California – Orange County Facility
Labs OC01 – OC13

41 Tesla Ave. Irvine, CA 92618
(888) 364-2378 Fax: (503) 844-3826



Oregon – Evergreen Facility
Labs EV01 – EV11

22975 NW Evergreen Pkwy. Suite 400 Hillsboro, OR 97124
(503) 844-4066 Fax: (503) 844-3826

Washington – Sultan Facility
Labs SU01 – SU07

14128 339th Ave. SE Sultan, WA 98294
(888) 364-2378

Party Requesting the Test

Company Name:	SafeWorks, LLC
Address:	365 Upland Drive
City, State, Zip:	Tukwila, WA 98188
Test Requested By:	Gavin Brickell
Model:	SafeWorks Pendant
First Date of Test:	February 20, 2009
Last Date of Test:	April 2, 2009
Receipt Date of Samples:	February 2, 2009
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

Operator wears a pendant that only transmits. It has no receive capability.

Testing Objective:

Seeking to demonstrate compliance of the pendant under FCC 15.249 for operation in the 915 MHz Band.

EUT Photo

CONFIGURATION 1 SPID0004

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SafeWorks Pendant	SafeWorks, LLC	SafeWorks Pendant	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Power Adapter	Cincon Electronics Co., LTD.	TR10R075	TR10R075-ASUE-11A13 0731

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Power	PA	1.8m	PA (Yes)	SafeWorks Pendant	Power Adapter
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 2 SPID0004

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
SafeWorks Pendant	SafeWorks, LLC	Safeworks Pendant	None

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	2/20/2009	Field Strength of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	2/24/2009	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	4/2/2009	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Field Strength of Fundamental

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION
Tx

MODE USED FOR FINAL DATA
Tx

POWER SETTINGS INVESTIGATED
Battery
120VAC/60Hz

POWER SETTINGS USED FOR FINAL DATA
Battery
120VAC/60Hz

FREQUENCY RANGE INVESTIGATED			
Start Frequency	902MHz	Stop Frequency	928MHz

SAMPLE CALCULATIONS
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT					
Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E44440A	AFA	11/14/2008	12
EV01 Cables		Bilog Cables	EVA	5/19/2008	13
Antenna, Biconilog	EMCO	3141	AXE	1/15/2008	24

MEASUREMENT BANDWIDTHS				
	Frequency Range	**Peak Data**	**Quasi-Peak Data**	**Average Data**
	(MHz)	**(kHz)**	**(kHz)**	**(kHz)**
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0
Measurements were made using the bandwidths and detectors specified. No video filter was used.				

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting while set at the channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003).

NORTHWEST EMC

Field Strength of Fundamental

PSA 2007.07.21
EMI 2008.7.3

EUT:	SafeWorks Pendant	Work Order:	SPID0004
Serial Number:	None	Date:	02/20/09
Customer:	SafeWorks, LLC	Temperature:	22
Attendees:	None	Humidity:	29%
Project:	None	Barometric Pres.:	30.23
Tested by:	Jennifer Herrett	Power: 120VAC/60Hz	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.249:2009	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

None

EUT OPERATING MODES

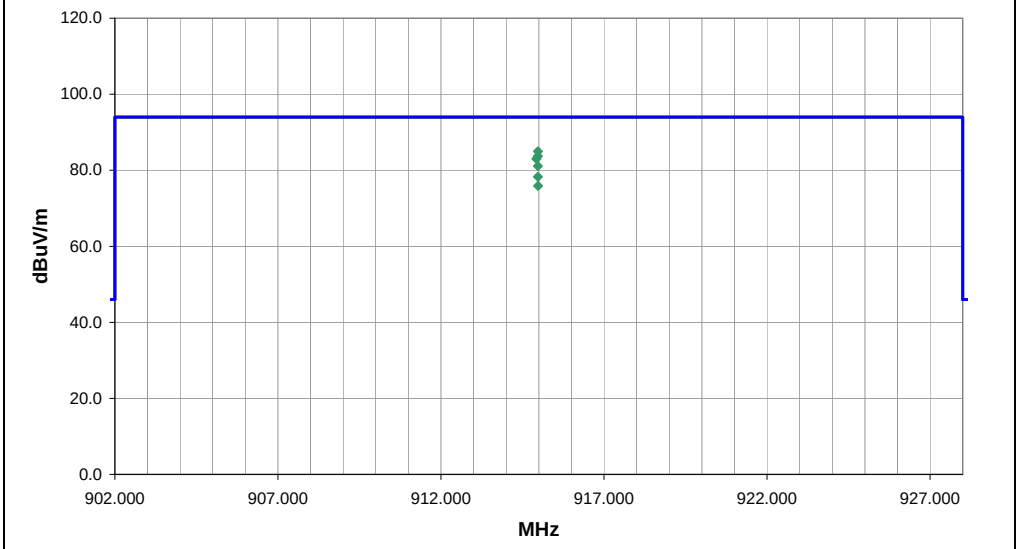
Tx

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	5
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
914.973	51.7	33.3	277.0	1.0	0.0	0.0	H-Bilog	QP	3.0	85.0	94.0	-9.0	EUT on side (power port up)
914.974	50.4	33.3	274.0	1.0	0.0	0.0	H-Bilog	QP	3.0	83.7	94.0	-10.3	EUT horizontal (buttons down)
914.926	49.7	33.3	193.0	1.0	0.0	0.0	H-Bilog	QP	3.0	83.0	94.0	-11.0	EUT vertical
914.975	47.8	33.3	147.0	1.0	0.0	0.0	V-Bilog	QP	3.0	81.1	94.0	-12.9	EUT vertical
914.974	45.0	33.3	110.0	1.0	0.0	0.0	V-Bilog	QP	3.0	78.3	94.0	-15.7	EUT horizontal (buttons down)
914.979	42.6	33.3	182.0	1.2	0.0	0.0	V-Bilog	QP	3.0	75.9	94.0	-18.1	EUT on side (power port up)

NORTHWEST EMC

Field Strength of Fundamental

PSA 2007.07.21
EMI 2008.7.3

EUT:	SafeWorks Pendant	Work Order:	SPID0004
Serial Number:	None	Date:	02/20/09
Customer:	SafeWorks, LLC	Temperature:	22
Attendees:	None	Humidity:	29%
Project:	None	Barometric Pres.:	30.23
Tested by:	Jennifer Herrett	Power: Battery	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.249:2009	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

None

EUT OPERATING MODES

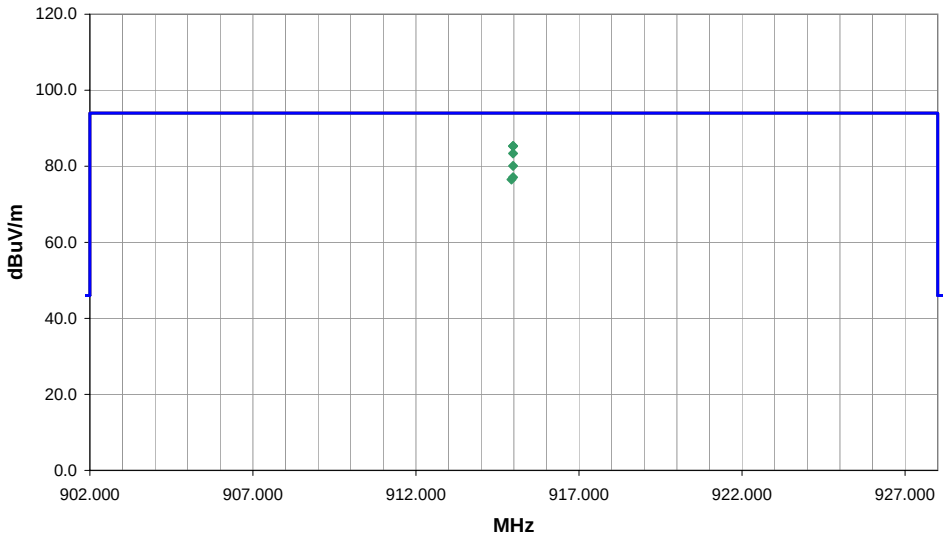
Tx

DEVIATIONS FROM TEST STANDARD

No deviations.

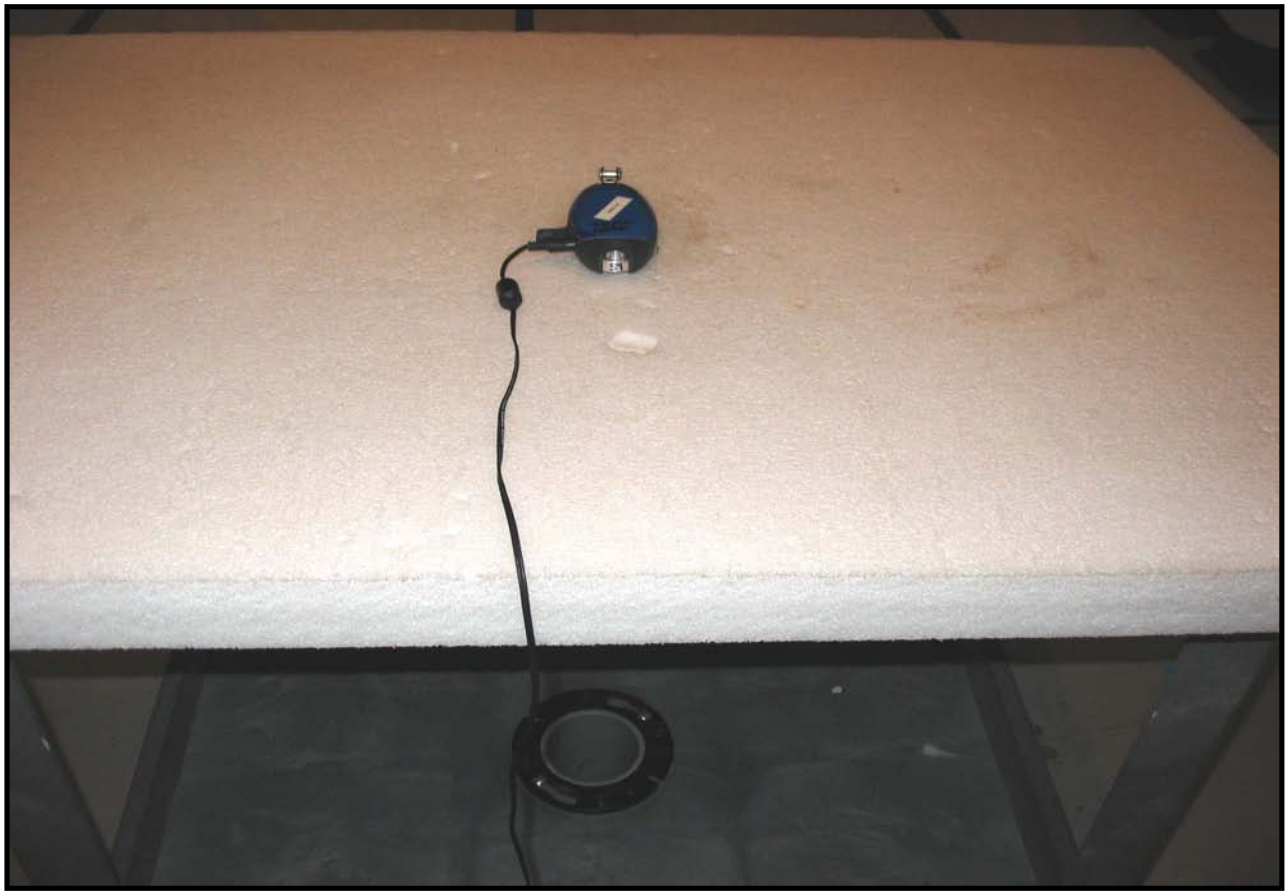
Run #	6
Configuration #	2
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
914.979	52.0	33.3	116.0	1.0	3.0	0.0	H-Bilog	QP	0.0	85.3	94.0	-8.7	EUT horizontal (buttons down)
914.979	52.0	33.3	168.0	1.0	3.0	0.0	H-Bilog	QP	0.0	85.3	94.0	-8.7	EUT on side (power port up)
914.976	50.1	33.3	91.0	1.3	3.0	0.0	V-Bilog	QP	0.0	83.4	94.0	-10.6	EUT vertical
914.976	46.8	33.3	26.0	1.7	3.0	0.0	V-Bilog	QP	0.0	80.1	94.0	-13.9	EUT horizontal (buttons down)
914.979	43.8	33.3	162.0	1.3	3.0	0.0	V-Bilog	QP	0.0	77.1	94.0	-16.9	EUT on side (power port up)
914.929	43.2	33.3	209.0	1.0	3.0	0.0	H-Bilog	QP	0.0	76.5	94.0	-17.5	EUT vertical

Field Strength of Fundamental



Field Strength of Fundamental

Field Strength of Fundamental


915MHz
US/RX
R1292

Field Strength of Fundamental

SPURIOUS RADIATED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Running per operating instructions. AC adapter attached.
Running per operating instructions

MODE USED FOR FINAL DATA

Running per operating instructions. AC adapter attached.

POWER SETTINGS INVESTIGATED

120VAC/60Hz

POWER SETTINGS USED FOR FINAL DATA

120VAC/60Hz

FREQUENCY RANGE INVESTIGATED

Start Frequency	30MHz	Stop Frequency	12500MHz

CLOCKS AND OSCILLATORS

915MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAY	12/11/2008	13
EV12 Cables		Standard Gain Horn Cables	EVU	5/14/2008	13
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVH	5/14/2008	13
Antenna, Horn	ETS	3160.07	AHZ	10/14/2008	24
EV12 Cables		Double Ridge Horn Cables	EVT	6/17/2008	13
Pre-Amplifier	Miteq	AMF-3D00100800-32-13P	AVF	6/17/2008	13
Antenna, Horn	ETS	3115	AIB	8/25/2008	24
EV12 Cables		Bilog Cables	EVS	6/17/2008	13
Pre-Amplifier	Miteq	AM-1616-1000	AVM	6/17/2008	13
Antenna, Biconilog	EMCO	3141	AXG	11/4/2008	13

MEASUREMENT BANDWIDTHS

	Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This requires the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search is utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT.

Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 3 meters or 10 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

NORTHWEST EMC

SURIOUS RADIATED EMISSIONS DATA SHEET

PSA 2007.07.21
EMI 2008.7.3

EUT:	SafeWorks Pendant	Work Order:	SPID0004
Serial Number:	None	Date:	02/24/09
Customer:	SafeWorks, LLC	Temperature:	21.3 °C
Attendees:	None	Humidity:	38%
Project:	None	Barometric Pres.:	1013.0mb
Tested by:	Dan Haas	Power: 120VAC/60Hz	Job Site: EV12

TEST SPECIFICATIONS	Test Method
FCC 15.249:2009	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

See notes for EUT orientation.

EUT OPERATING MODES

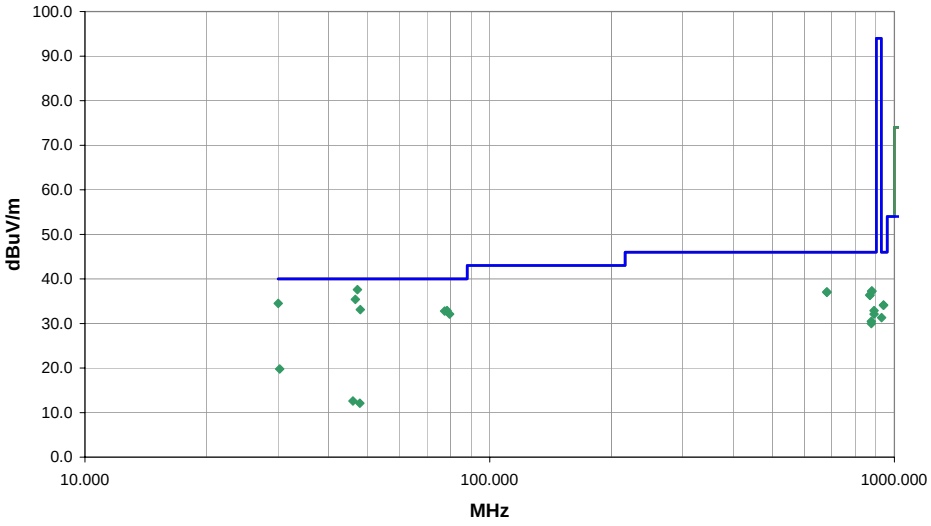
Running per operating instructions

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
47.139	42.7	-5.1	19.0	1.0	3.0	0.0	V-Bilog	QP	0.0	37.6	40.0	-2.4	AC adapter connected, EUT vertical.
46.578	40.3	-4.9	40.0	1.0	3.0	0.0	V-Bilog	QP	0.0	35.4	40.0	-4.6	AC adapter connected, EUT vertical.
30.026	31.7	2.8	12.0	1.0	3.0	0.0	V-Bilog	QP	0.0	34.5	40.0	-5.5	AC adapter connected, EUT vertical.
47.886	38.4	-5.3	41.0	1.0	3.0	0.0	V-Bilog	QP	0.0	33.1	40.0	-6.9	AC adapter connected, EUT vertical.
78.488	40.8	-7.9	98.0	1.2	3.0	0.0	V-Bilog	QP	0.0	32.9	40.0	-7.1	AC adapter connected, EUT vertical.
77.401	40.8	-8.0	121.0	1.5	3.0	0.0	V-Bilog	QP	0.0	32.8	40.0	-7.2	AC adapter connected, EUT vertical.
79.608	39.9	-7.8	43.0	1.6	3.0	0.0	V-Bilog	QP	0.0	32.1	40.0	-7.9	AC adapter connected, EUT vertical.
879.415	24.7	12.6	285.0	3.2	3.0	0.0	V-Bilog	QP	0.0	37.3	46.0	-8.7	AC adapter connected, EUT vertical.
879.401	24.6	12.6	192.0	1.2	3.0	0.0	H-Bilog	QP	0.0	37.2	46.0	-8.8	AC adapter connected, EUT vertical.
681.244	27.5	9.6	192.0	1.8	3.0	0.0	V-Bilog	QP	0.0	37.1	46.0	-8.9	AC adapter connected, EUT vertical.
681.241	27.4	9.6	315.0	3.4	3.0	0.0	H-Bilog	QP	0.0	37.0	46.0	-9.0	AC adapter connected, EUT vertical.
869.860	24.5	11.9	266.0	1.5	3.0	0.0	H-Bilog	QP	0.0	36.4	46.0	-9.6	AC adapter connected, EUT vertical.
869.853	24.4	11.9	126.0	1.8	3.0	0.0	V-Bilog	QP	0.0	36.3	46.0	-9.7	AC adapter connected, EUT vertical.
940.220	20.9	13.2	184.0	1.2	3.0	0.0	H-Bilog	QP	0.0	34.1	46.0	-11.9	AC adapter connected, EUT vertical.
940.235	20.9	13.2	67.0	1.8	3.0	0.0	V-Bilog	QP	0.0	34.1	46.0	-11.9	AC adapter connected, EUT vertical.
890.823	20.0	12.9	292.0	3.5	3.0	0.0	V-Bilog	QP	0.0	32.9	46.0	-13.1	AC adapter connected, EUT vertical.
890.821	19.2	12.9	346.0	1.7	3.0	0.0	H-Bilog	QP	0.0	32.1	46.0	-13.9	AC adapter connected, EUT vertical.
929.616	18.1	13.2	132.0	2.0	3.0	0.0	H-Bilog	QP	0.0	31.3	46.0	-14.7	AC adapter connected, EUT vertical.
877.078	18.1	12.4	246.0	3.0	3.0	0.0	H-Bilog	QP	0.0	30.5	46.0	-15.5	AC adapter connected, EUT vertical.
877.006	17.6	12.4	271.0	1.7	3.0	0.0	V-Bilog	QP	0.0	30.0	46.0	-16.0	AC adapter connected, EUT vertical.

NORTHWEST
EMC

SPURIOUS RADIATED EMISSIONS DATA SHEET

PSA 2007.07.21
EMI 2008.7.3

EUT:	SafeWorks Pendant	**Work Order:**	SPID0004
Serial Number:	None	**Date:**	02/24/09
Customer:	SafeWorks, LLC	**Temperature:**	21.3 °C
Attendees:	None	**Humidity:**	38%
Project:	None	**Barometric Pres.:**	1013.0mb
Tested by:	Dan Haas	**Power:** 120VAC/60Hz	**Job Site:** EV12

TEST SPECIFICATIONS	Test Method
FCC 15.249:2009	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	**Test Distance (m)**	3

COMMENTS

See notes for EUT orientation.

EUT OPERATING MODES

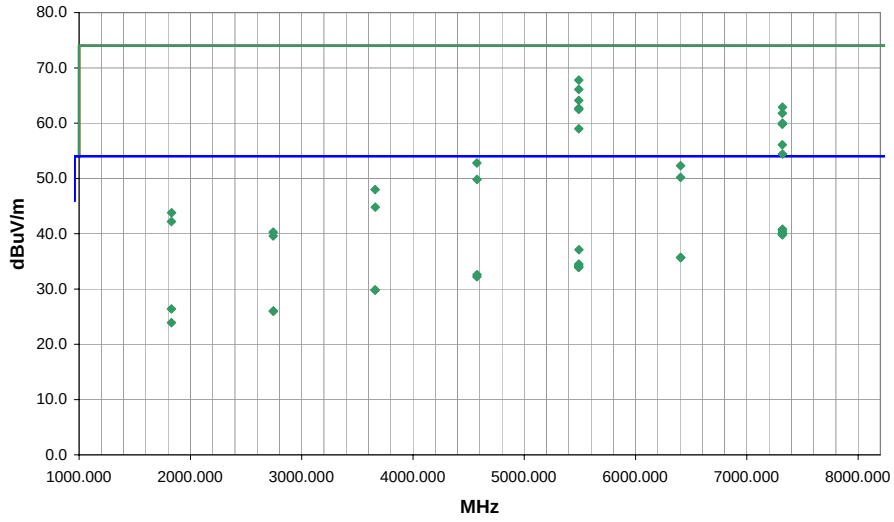
Running per operating instructions

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	2
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
5489.251	58.7	9.1	161.0	1.8	3.0	0.0	H-Horn	PK	0.0	67.8	74.0	-6.2	AC adapter connected, EUT on its side.
5490.346	57.0	9.1	237.0	1.8	3.0	0.0	H-Horn	PK	0.0	66.1	74.0	-7.9	AC adapter connected, EUT horizontal.
5489.596	55.0	9.1	146.0	1.2	3.0	0.0	H-Horn	PK	0.0	64.1	74.0	-9.9	AC adapter connected, EUT vertical.
7320.063	48.8	14.1	165.0	1.2	3.0	0.0	H-Horn	PK	0.0	62.9	74.0	-11.1	AC adapter connected, EUT vertical.
5489.953	53.6	9.1	120.0	1.4	3.0	0.0	V-Horn	PK	0.0	62.7	74.0	-11.3	AC adapter connected, EUT vertical.
5489.888	53.4	9.1	153.0	1.3	3.0	0.0	V-Horn	PK	0.0	62.5	74.0	-11.5	AC adapter connected, EUT on its side.
7318.933	47.7	14.1	131.0	1.4	3.0	0.0	H-Horn	PK	0.0	61.8	74.0	-12.2	AC adapter connected, EUT on its side.
7319.766	26.7	14.1	165.0	1.2	3.0	0.0	H-Horn	AV	0.0	40.8	54.0	-13.2	AC adapter connected, EUT vertical.
7319.189	26.6	14.1	215.0	1.2	3.0	0.0	V-Horn	AV	0.0	40.7	54.0	-13.3	AC adapter connected, EUT vertical.
7319.958	26.2	14.1	302.0	1.1	3.0	0.0	V-Horn	AV	0.0	40.3	54.0	-13.7	AC adapter connected, EUT horizontal.
7319.848	45.9	14.1	215.0	1.2	3.0	0.0	V-Horn	PK	0.0	60.0	74.0	-14.0	AC adapter connected, EUT vertical.
7320.248	25.9	14.1	109.0	1.7	3.0	0.0	V-Horn	AV	0.0	40.0	54.0	-14.0	AC adapter connected, EUT on its side.
7318.738	25.8	14.1	131.0	1.4	3.0	0.0	H-Horn	AV	0.0	39.9	54.0	-14.1	AC adapter connected, EUT on its side.
7318.893	25.7	14.1	0.0	1.7	3.0	0.0	H-Horn	AV	0.0	39.8	54.0	-14.2	AC adapter connected, EUT horizontal.
7318.868	45.7	14.1	302.0	1.1	3.0	0.0	V-Horn	PK	0.0	59.8	74.0	-14.2	AC adapter connected, EUT horizontal.
5489.823	49.9	9.1	0.0	1.9	3.0	0.0	V-Horn	PK	0.0	59.0	74.0	-15.0	AC adapter connected, EUT horizontal.
5490.891	28.0	9.1	161.0	1.8	3.0	0.0	H-Horn	AV	0.0	37.1	54.0	-16.9	AC adapter connected, EUT on its side.
7318.368	42.0	14.1	109.0	1.7	3.0	0.0	V-Horn	PK	0.0	56.1	74.0	-17.9	AC adapter connected, EUT on its side.
6404.215	24.6	11.1	164.0	1.9	3.0	0.0	V-Horn	AV	0.0	35.7	54.0	-18.3	AC adapter connected, EUT vertical.
6405.761	24.6	11.1	342.0	1.2	3.0	0.0	H-Horn	AV	0.0	35.7	54.0	-18.3	AC adapter connected, EUT vertical.

NORTHWEST EMC

SPURIOUS RADIATED EMISSIONS DATA SHEET

PSA 2007.07.21
EMI 2008.7.3

EUT:	SafeWorks Pendant			Work Order:	SPID0004
Serial Number:	None			Date:	02/24/09
Customer:	SafeWorks, LLC			Temperature:	21.3 °C
Attendees:	None			Humidity:	38%
Project:	None			Barometric Pres.:	1013.0mb
Tested by:	Dan Haas	Power:	120VAC/60Hz	Job Site:	EV12

TEST SPECIFICATIONS	Test Method
FCC 15.249:2009	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

See notes for EUT orientation.

EUT OPERATING MODES

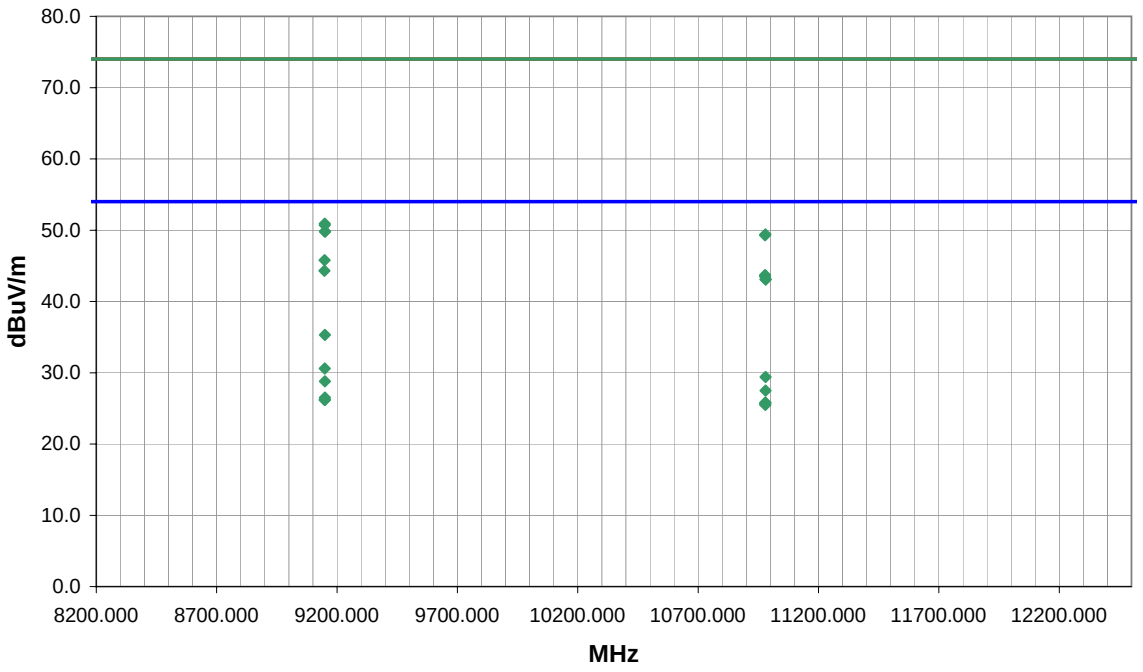
Running per operating instructions. AC adapter attached.

DEVIATIONS FROM TEST STANDARD

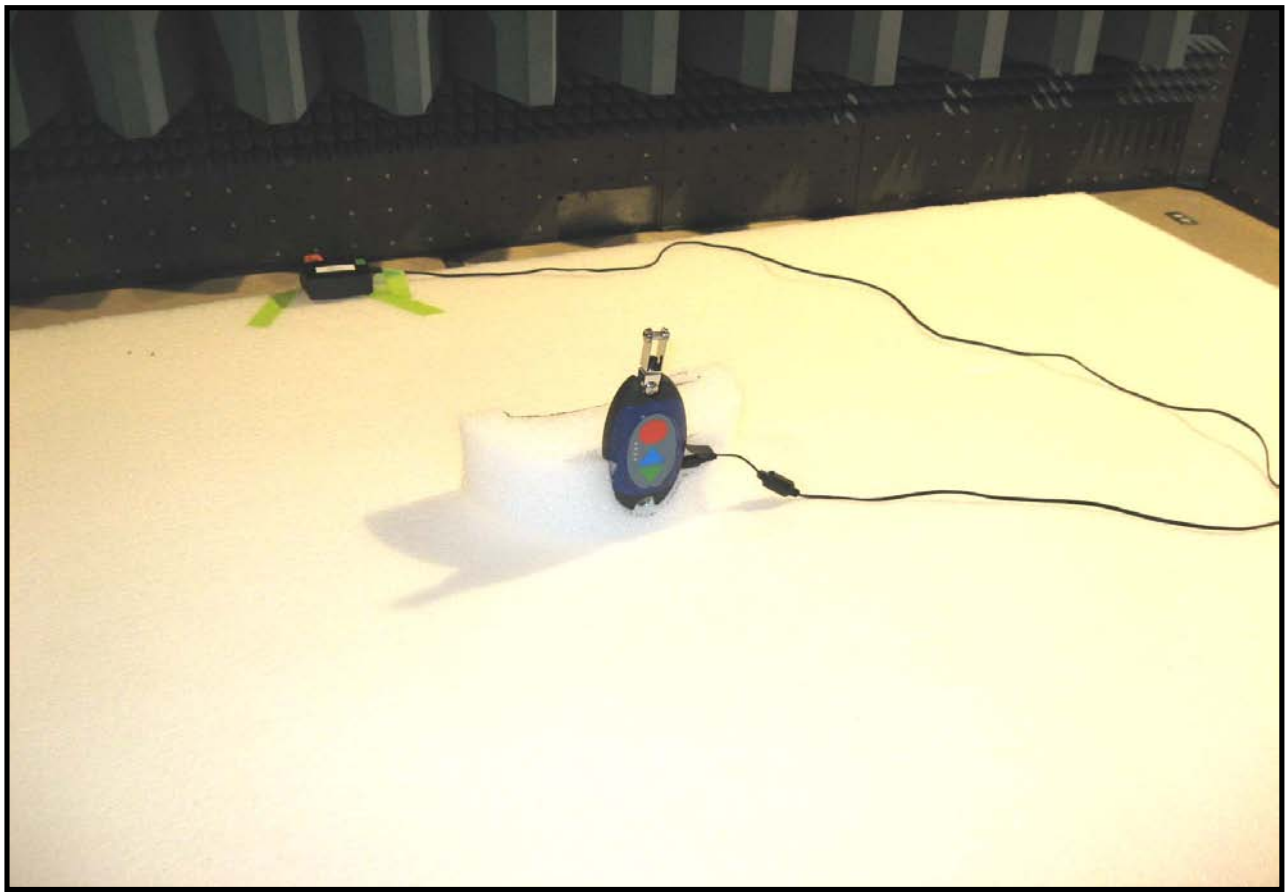
No deviations.

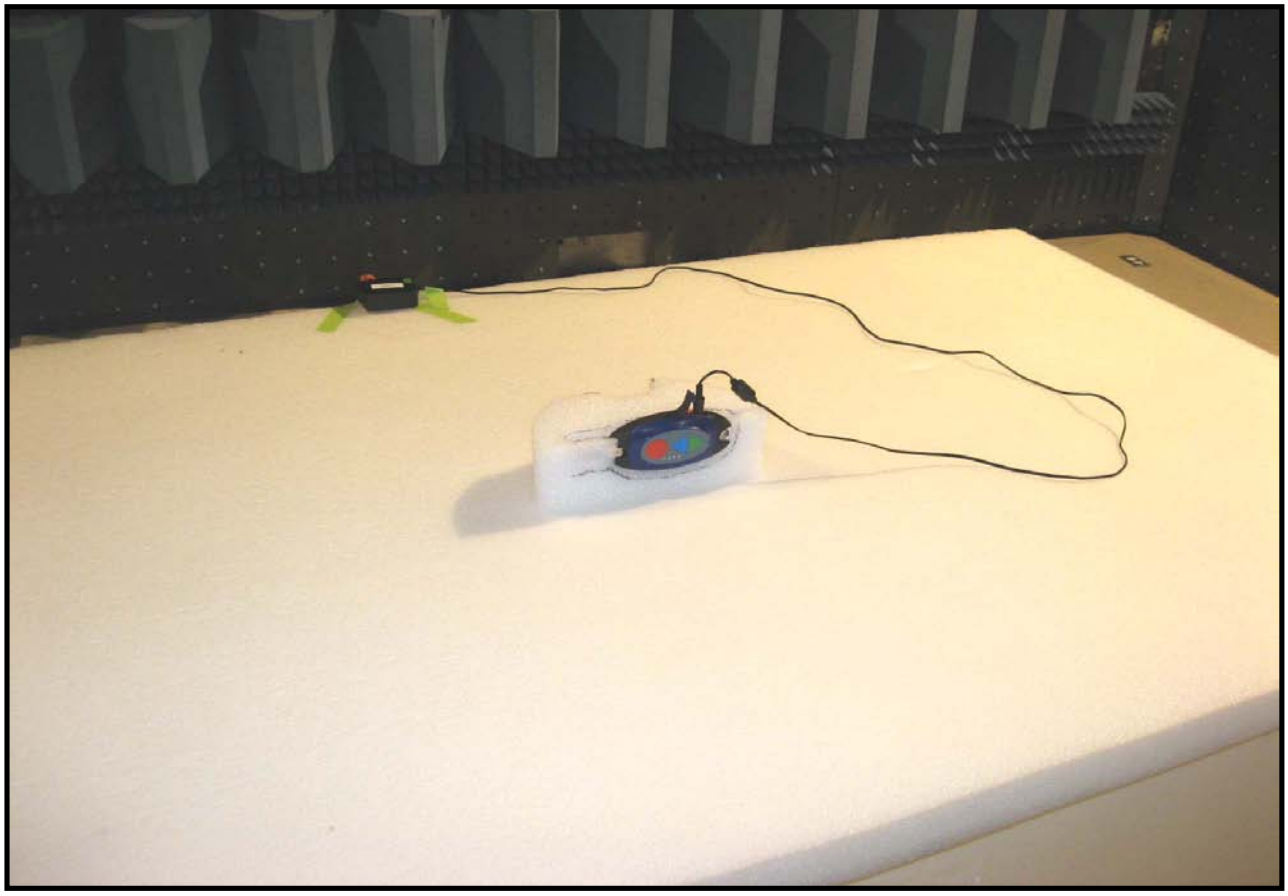
Run #	3
Configuration #	1
Results	Pass

Signature

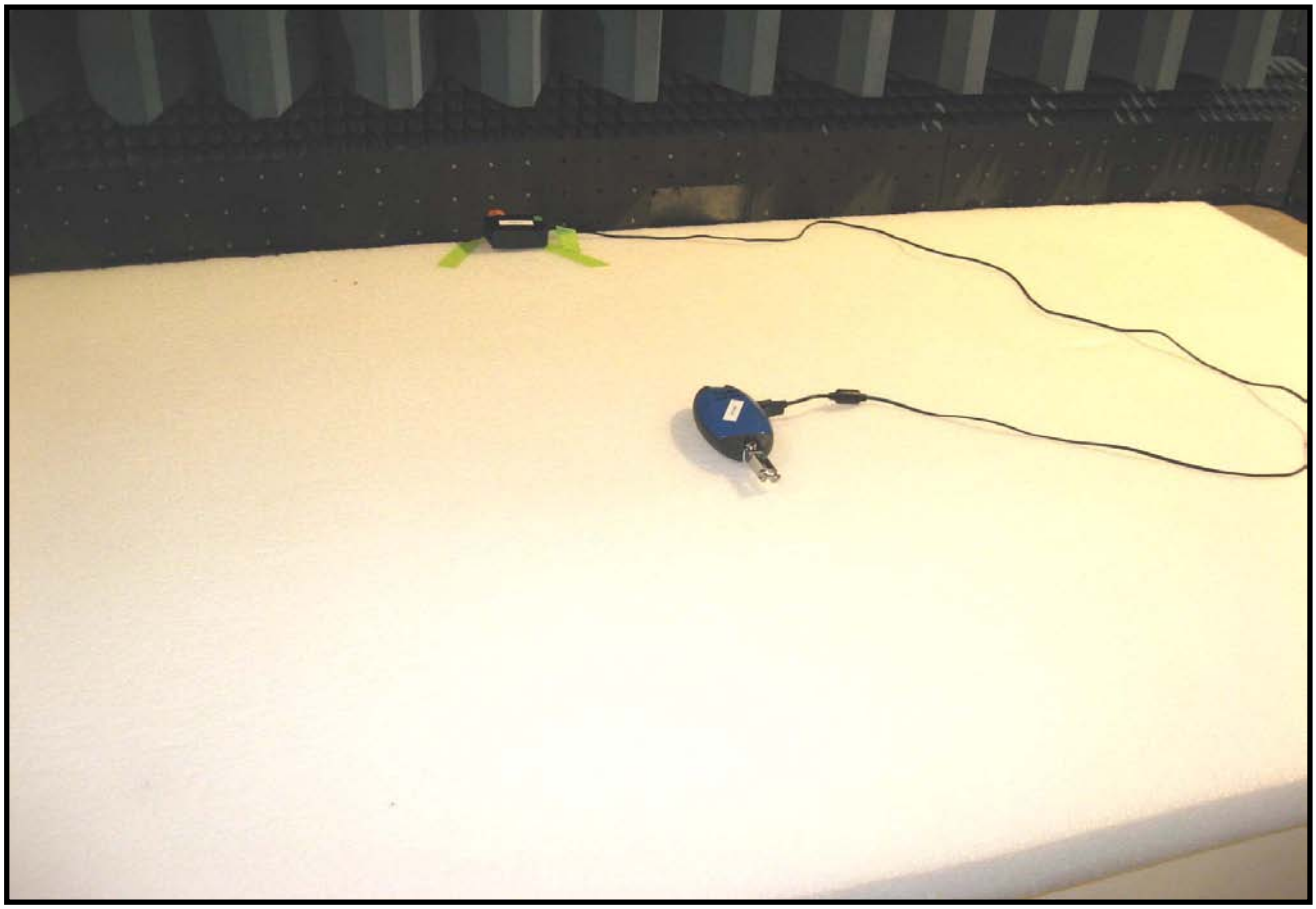


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
9149.654	46.3	-11.0	233.0	1.0	3.0	0.0	H-Horn	AV	0.0	35.3	54.0	-18.7
9149.180	61.9	-11.0	118.0	1.1	3.0	0.0	H-Horn	PK	0.0	50.9	74.0	-23.1
9149.305	61.7	-11.0	45.0	1.3	3.0	0.0	V-Horn	PK	0.0	50.7	74.0	-23.3
9149.151	41.6	-11.0	89.0	1.3	3.0	0.0	V-Horn	AV	0.0	30.6	54.0	-23.4
9149.405	60.8	-11.0	211.0	1.0	3.0	0.0	V-Horn	PK	0.0	49.8	74.0	-24.2
9150.260	60.8	-11.0	302.0	1.0	3.0	0.0	H-Horn	PK	0.0	49.8	74.0	-24.2
10980.090	40.9	-11.5	312.0	1.0	3.0	0.0	V-Horn	AV	0.0	29.4	54.0	-24.6
10979.090	60.9	-11.5	162.0	1.3	3.0	0.0	V-Horn	PK	0.0	49.4	74.0	-24.6
10978.140	60.8	-11.5	152.0	1.0	3.0	0.0	H-Horn	PK	0.0	49.3	74.0	-24.7
9149.541	39.8	-11.0	118.0	1.1	3.0	0.0	H-Horn	AV	0.0	28.8	54.0	-25.2
10979.800	39.0	-11.5	214.0	1.0	3.0	0.0	V-Horn	AV	0.0	27.5	54.0	-26.5
9149.833	37.5	-11.0	45.0	1.3	3.0	0.0	V-Horn	AV	0.0	26.5	54.0	-27.5
9148.659	37.2	-11.0	302.0	1.0	3.0	0.0	H-Horn	AV	0.0	26.2	54.0	-27.8
9149.531	37.2	-11.0	211.0	1.0	3.0	0.0	V-Horn	AV	0.0	26.2	54.0	-27.8
10979.330	37.3	-11.5	152.0	1.0	3.0	0.0	H-Horn	AV	0.0	25.8	54.0	-28.2
10979.710	37.3	-11.5	162.0	1.3	3.0	0.0	V-Horn	AV	0.0	25.8	54.0	-28.2
9148.355	56.8	-11.0	233.0	1.0	3.0	0.0	H-Horn	PK	0.0	45.8	74.0	-28.2
10978.180	37.1	-11.5	105.0	1.0	3.0	0.0	H-Horn	AV	0.0	25.6	54.0	-28.4
10979.180	37.0	-11.5	194.0	1.0	3.0	0.0	H-Horn	AV	0.0	25.5	54.0	-28.5
9148.045	55.3	-11.0	89.0	1.3	3.0	0.0	V-Horn	PK	0.0	44.3	74.0	-29.7
10978.300	55.2	-11.5	312.0	1.0	3.0	0.0	V-Horn	PK	0.0	43.7	74.0	-30.3
10978.030	55.0	-11.5	194.0	1.0	3.0	0.0	H-Horn	PK	0.0	43.5	74.0	-30.5
10979.780	54.6	-11.5	214.0	1.0	3.0	0.0	V-Horn	PK	0.0	43.1	74.0	-30.9
10980.590	54.6	-11.5	105.0	1.0	3.0	0.0	H-Horn	PK	0.0	43.1	74.0	-30.9





Spurious Radiated Emissions



EMC AC POWERLINE CONDUCTED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Transmitting

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SPID0004 - 1

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwarz	ESCI	ARH	8/28/2008	24 mo
High Pass Filter	T.T.E.	7766	HFG	2/23/2009	13 mo
Attenuator	Coaxicom	66702 2910-20	ATO	6/30/2008	13 mo
EV07 Cables		Conducted Cables	EVG	5/2/2008	13 mo
LISN	Solar	9252-50-R-24-BNC	LIR	2/4/2009	13 mo

MEASUREMENT BANDWIDTHS

	Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4-2. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm.

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2008.12.15
Version 2008.3.31

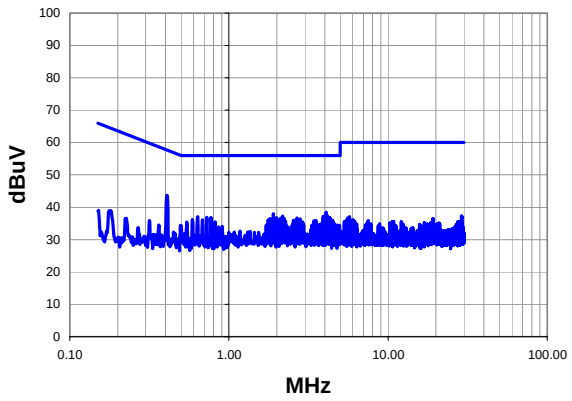
Work Order:	SPID0004	**Date:**	04/02/09		
Project:	None	**Temperature:**	21.7 °C		
Job Site:	EV07	**Humidity:**	37.3		
Serial Number:	None	**Barometric Pres.:**	1017.6mb	**Tested by:**	Rod Peloquin

EUT:	SafeWorks Pendant
Configuration:	1 - SafeWorks Pendant Basic Configuration - With Power Adapter
Customer:	SafeWorks, LLC
Attendees:	None
EUT Power:	120VAC/60Hz
Operating Mode:	Transmitting
Deviations:	No deviations.
Comments:	None

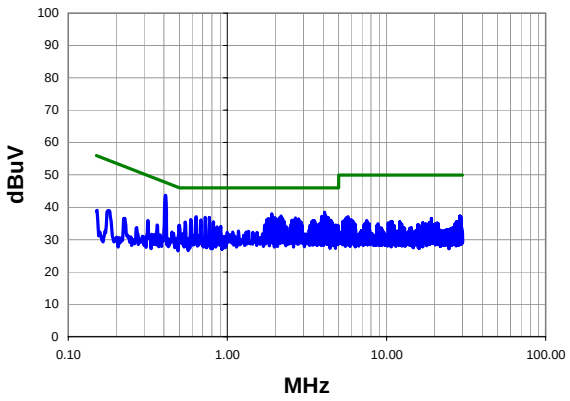
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2009		ANSI C63.4:2003
RSS-Gen:2007		RSS-Gen :2007

Run #	5	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.408	22.8	20.9	43.7	57.7	-13.9
4.088	17.8	20.6	38.4	56.0	-17.6
1.904	17.4	20.6	38.0	56.0	-18.0
4.128	16.9	20.6	37.5	56.0	-18.5
2.176	16.7	20.6	37.3	56.0	-18.7
3.904	16.6	20.6	37.2	56.0	-18.8
4.040	16.5	20.6	37.1	56.0	-18.9
3.992	16.5	20.6	37.1	56.0	-18.9
3.944	16.5	20.6	37.1	56.0	-18.9
0.636	16.3	20.8	37.1	56.0	-18.9
4.224	16.3	20.6	36.9	56.0	-19.1
0.725	16.1	20.8	36.9	56.0	-19.1
4.176	16.2	20.6	36.8	56.0	-19.2
4.264	16.2	20.6	36.8	56.0	-19.2
0.770	16.1	20.7	36.8	56.0	-19.2
1.992	16.2	20.6	36.8	56.0	-19.2
4.312	16.1	20.6	36.7	56.0	-19.3
2.680	16.1	20.6	36.7	56.0	-19.3
2.128	16.1	20.6	36.7	56.0	-19.3
1.808	15.9	20.6	36.5	56.0	-19.5

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.408	22.8	20.9	43.7	47.7	-3.9
4.088	17.8	20.6	38.4	46.0	-7.6
1.904	17.4	20.6	38.0	46.0	-8.0
4.128	16.9	20.6	37.5	46.0	-8.5
2.176	16.7	20.6	37.3	46.0	-8.7
3.904	16.6	20.6	37.2	46.0	-8.8
4.040	16.5	20.6	37.1	46.0	-8.9
3.992	16.5	20.6	37.1	46.0	-8.9
3.944	16.5	20.6	37.1	46.0	-8.9
0.636	16.3	20.8	37.1	46.0	-8.9
4.224	16.3	20.6	36.9	46.0	-9.1
0.725	16.1	20.8	36.9	46.0	-9.1
4.176	16.2	20.6	36.8	46.0	-9.2
4.264	16.2	20.6	36.8	46.0	-9.2
0.770	16.1	20.7	36.8	46.0	-9.2
1.992	16.2	20.6	36.8	46.0	-9.2
4.312	16.1	20.6	36.7	46.0	-9.3
2.680	16.1	20.6	36.7	46.0	-9.3
2.128	16.1	20.6	36.7	46.0	-9.3
1.808	15.9	20.6	36.5	46.0	-9.5

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

PSA-ESCI 2008.12.15
Version 2008.3.31

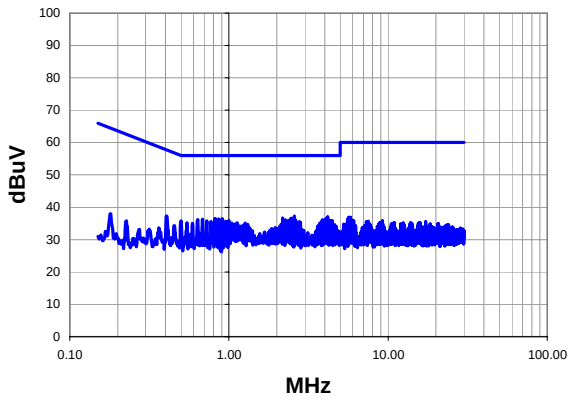
Work Order:	SPID0004	**Date:**	04/02/09		
Project:	None	**Temperature:**	21.7 °C		
Job Site:	EV07	**Humidity:**	37.3		
Serial Number:	None	**Barometric Pres.:**	1017.6mb	**Tested by:**	Rod Peloquin

EUT:	SafeWorks Pendant
Configuration:	1 - SafeWorks Pendant Basic Configuration - With Power Adapter
Customer:	SafeWorks, LLC
Attendees:	None
EUT Power:	120VAC/60Hz
Operating Mode:	Transmitting
Deviations:	No deviations.
Comments:	None

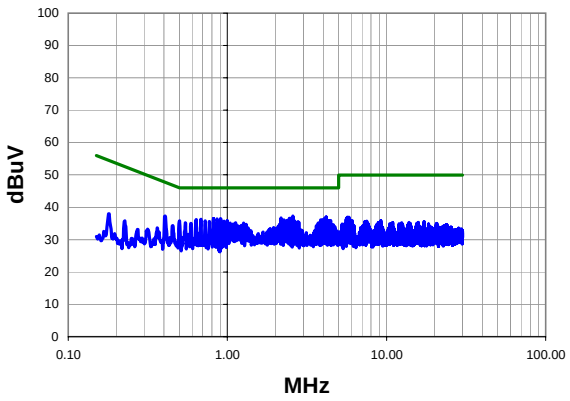
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2009		ANSI C63.4:2003
RSS-Gen:2007		RSS-Gen :2007

Run #	6	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
2.584	16.7	20.6	37.3	56.0	-18.7
4.176	16.4	20.6	37.0	56.0	-19.0
2.176	16.1	20.6	36.7	56.0	-19.3
4.088	16.0	20.6	36.6	56.0	-19.4
2.448	16.0	20.6	36.6	56.0	-19.4
2.496	16.0	20.6	36.6	56.0	-19.4
0.906	15.9	20.6	36.5	56.0	-19.5
0.818	15.8	20.7	36.5	56.0	-19.5
4.136	15.8	20.6	36.4	56.0	-19.6
0.862	15.7	20.7	36.4	56.0	-19.6
0.682	15.5	20.8	36.3	56.0	-19.7
4.040	15.6	20.6	36.2	56.0	-19.8
0.636	15.4	20.8	36.2	56.0	-19.8
2.544	15.6	20.6	36.2	56.0	-19.8
3.944	15.5	20.6	36.1	56.0	-19.9
3.856	15.5	20.6	36.1	56.0	-19.9
2.264	15.5	20.6	36.1	56.0	-19.9
4.448	15.3	20.6	35.9	56.0	-20.1
4.312	15.3	20.6	35.9	56.0	-20.1
2.360	15.3	20.6	35.9	56.0	-20.1

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
2.584	16.7	20.6	37.3	46.0	-8.7
4.176	16.4	20.6	37.0	46.0	-9.0
2.176	16.1	20.6	36.7	46.0	-9.3
4.088	16.0	20.6	36.6	46.0	-9.4
2.448	16.0	20.6	36.6	46.0	-9.4
2.496	16.0	20.6	36.6	46.0	-9.4
0.906	15.9	20.6	36.5	46.0	-9.5
0.818	15.8	20.7	36.5	46.0	-9.5
4.136	15.8	20.6	36.4	46.0	-9.6
0.862	15.7	20.7	36.4	46.0	-9.6
0.682	15.5	20.8	36.3	46.0	-9.7
4.040	15.6	20.6	36.2	46.0	-9.8
0.636	15.4	20.8	36.2	46.0	-9.8
2.544	15.6	20.6	36.2	46.0	-9.8
3.944	15.5	20.6	36.1	46.0	-9.9
3.856	15.5	20.6	36.1	46.0	-9.9
2.264	15.5	20.6	36.1	46.0	-9.9
4.448	15.3	20.6	35.9	46.0	-10.1
4.312	15.3	20.6	35.9	46.0	-10.1
2.360	15.3	20.6	35.9	46.0	-10.1