

Nemko USA, Inc.

2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005



www.nemko.com

EMC TEST REPORT

For The Weight Processor

Model: HI6510-WP-10-EIP

Prepared for:

Hardy Process Solutions
9440 Carroll Park Drive Suite 150
San Diego CA 92121

Testing performed per the following:

EMC
Directive
2004/108/EC



PREPARED on October 11, 2013

REPORT NUMBER: 2013 10244838 EMC

PROJECT NUMBER: Q10250480

NEX NUMBER: 244838

TABLE OF CONTENTS

DOCUMENT HISTORY	4
TEST FACILITY ACCREDITATION	4
CERTIFICATION.....	5
1. ADMINISTRATIVE DATA AND TEST SUMMARY	6
1.1.ADMINISTRATIVE DATA	6
1.2.REFERENCED STANDARDS FOR RADIATED EMISSIONS	7
1.3.REFERENCED STANDARDS FOR ELECTROMAGNETIC COMPATIBILITY	7
1.4.TEST SUMMARY	8
2. SYSTEM CONFIGURATION.....	10
2.1.SYSTEM COMPONENTS AND POWER CABLES.....	10
2.2.DEVICE INTERCONNECTION AND I/O CABLES	10
2.3.DESCRPTION AND METHOD OF EXERCISING THE EUT.....	10
2.4.DESIGN MODIFICATIONS FOR COMPLIANCE	11
3. MODELS REPRESENTED.....	12
4. DESCRIPTION OF TEST SITE.....	15
4.1.DESCRPTION OF TEST SITE	15
4.2.TEST SITE REGISTRATIONS.....	15
5. DESCRIPTION OF TESTING METHODS	16
5.1.INTRODUCTION.....	16
5.2.TEST METHODS	16
5.3.CONFIGURATION AND METHODS OF MEASUREMENTS FOR CONDUCTED EMISSIONS.....	16
5.4.CONFIGURATION AND METHODS OF MEASUREMENTS FOR RADIATED EMISSIONS	17
5.5.POWER LINE HARMONICS: EN 61000-3-2: 2006+A1:2009+A2:2009	18
5.6.POWER LINE FLUCTUATIONS/FLICKER: EN 61000-3-3: 2008.....	18
5.7.DEVICE PERFORMANCE CRITERIA FOR IMMUNITY TESTS.....	19
5.8.ELECTROSTATIC DISCHARGE IMMUNITY: EN 61000-4-2: 2009.....	20
5.9.RADIO FREQUENCY IMMUNITY: EN 61000-4-3: 2006 +A1:2008 +A2:2010	20
5.10.ELECTRICAL FAST TRANSIENT IMMUNITY: EN 61000-4-4: 2004+A1: 2010	21
5.11.POWER LINE SURGE IMMUNITY: EN 61000-4-5: 2006	21
5.12.RADIO FREQUENCY CONDUCTED COMMON MODE IMMUNITY: EN 61000-4-6: 2009	21
5.13.POWER FREQUENCY MAGNETIC FIELD IMMUNITY: EN 61000-4-8: 2010.....	22
5.14.VOLTAGE DIPS AND SHORT INTERRUPTIONS: EN 61000-4-11: 2004.....	22
5.15.TELECOM CONDUCTED EMISSIONS TEST DATA.....	23
5.16.RADIATED EMISSIONS TEST DATA	24
5.18.ELECTROSTATIC DISCHARGE IMMUNITY TEST RESULTS & TEST POINTS.....	27
5.19.RADIO FREQUENCY IMMUNITY TEST RESULTS.....	34
5.20.ELECTRICAL FAST TRANSIENT BURST IMMUNITY TEST RESULTS	36
5.21.RF CONDUCTED COMMON MODE DISTURBANCE IMMUNITY TEST RESULTS	37
5.22.POWER FREQUENCY MAGNETIC FIELD IMMUNITY	38
TEST SETUP DIAGRAMS	
Figure 1.ESD Test Points	28

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	2 of 49

Nemko USA, Inc.

2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005



Figure 2.ESD Test Points	29
Figure 3.ESD Test Points	30
Figure 4.ESD Test Points	31
Figure 5.ESD Test Points	32
Figure 6.ESD Test Points	33

TEST CONFIGURATION PHOTOGRAPHS

Photograph 1. Photo of Radiated Emissions Modification	11
Photograph 2.EUT Front and Rear	13
Photograph 3. General EUT Test Configuration	14
Photograph 4. Conducted Emissions Test Configuration	39
Photograph 5. Radiated Emissions Test Configuration	40
Photograph 6. ESD Test Configuration	41
Photograph 7. Radio Frequency Immunity Test Configuration	42
Photograph 8. EFT Immunity Test Configuration	43
Photograph 9. RF Conducted Immunity Test Configuration	44
Photograph 10. Power Frequency Magnetic Field Immunity Test Configuration	45

APPENDICES

A. RADIATED EMISSIONS MEASUREMENT UNCERTAINTIES	46
B. NEMKO USA, INC. TEST EQUIPMENT & FACILITIES CALIBRATION PROGRAM	48

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	3 of 49

Nemko USA, Inc.

2210 Faraday Ave, Suite 150
Carlsbad, CA 92008
Phone (760) 444-3500 Fax (760) 444-3005



DOCUMENT HISTORY

REVISION	DATE	COMMENTS
-	October 11, 2013	Prepared By: William Dey
-	October 11, 2013	Initial Release: Alan Laudani

NOTE: Nemko USA, Inc. hereby makes the following statements so as to conform to the Subclause 5.10 Requirements of ISO/IEC 17025 "General Criteria For the Competence Of Testing and Calibration Laboratories":

- o The unit described in this report was received at Nemko USA, Inc.'s facilities on October 1, 2013.
- o Testing was performed on the unit described in this report on October 1, 2013 to October 7, 2013.
- o The Test Results reported herein apply only to the Unit actually tested, and to substantially identical Units.
- o This report does not imply the endorsement of the Federal Communications Commission (FCC), NVLAP or any other government agency.

This Report is the property of Nemko USA, Inc., and shall not be reproduced, except in full, without prior written approval of Nemko USA, Inc. However, all ownership rights are hereby returned unconditionally to Hardy Process Solutions and approval is hereby granted to Hardy Process Solutions and its employees and agents to reproduce all or part of this report for any legitimate business purpose without further reference to Nemko USA, Inc.

Test Facility Accreditation

Nemko USA, Inc. is accredited through National Voluntary Laboratory Accreditation Program.



NVLAP LAB CODE 200116-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	4 of 49



CERTIFICATION

The compatibility testing and this report have been prepared by Nemko USA, Inc., an independent electromagnetic compatibility consulting and test laboratory.

Testing and data collection were accomplished in accordance with the test methods listed in this report.

I certify the data evaluation and equipment configuration herein to be a true and accurate representation of the sample's test characteristics, as of the test date(s), and for the design of the test sample utilized to compile this report.

Bruce Ketterling
EMC Division Manager, Nemko USA, Inc.

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	5 of 49

1. ADMINISTRATIVE DATA AND TEST SUMMARY

1.1. Administrative Data

CLIENT: Hardy Process Solutions
9440 Carroll Park Drive Suite 150
San Diego CA 92121
(858) 278-2900 EXT. 1407

CONTACT: Lito Guiriba
E-Mail: Lito.Guiriba@hardysolutions.com

DATE (S) OF TEST: October 1, 2013 to October 7, 2013.

EQUIPMENT UNDER TEST (EUT): Weight Processor

MODEL TESTED: HI6510-WP-10-EIP

MODELS REPRESENTED: REFER TO SECTION 3

SERIAL NUMBER: 4

SOFTWARE REVISION: HI6500 1.0.0.16

CONDITION UPON RECEIPT: Suitable for Test

TEST SPECIFICATION: Radio Frequency Emissions and Electromagnetic Immunity tests in accordance with requirements of standard EN 61326-1: 2013.

Emissions Class: "A"
Electromagnetic Environment:
☐ Basic EM Environment
☒ Industrial EM Environment
☐ Industrial EM Environment

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	6 of 49

1.2. Referenced Standards for Radiated Emissions

Test Type	In Accordance with Document	Document Title
Conducted and Radiated Emissions	EN 55011:2009+A1:2010	Information technology equipment—Radio disturbance characteristics —Limits and methods of measurement
Power Line Harmonics	EN 61000-3-2: 2006+A1:2009+A2:2009	Electromagnetic Compatibility, Limits for Harmonic Current Emissions, Equipment Input Current $\leq 16A$
Power Line Flicker	EN 61000-3-3: 2008	Electromagnetic Compatibility, Limitation of Voltage Fluctuations and Flicker In Low-Voltage Supply Systems for Equipment with Rated Current $\leq 16A$

1.3. Referenced Standards for Electromagnetic Compatibility

Test Type	In Accordance with Document	Document Title
Electrostatic Discharge Immunity	EN 61000-4-2:2009	Electromagnetic Compatibility—Testing and measurement techniques - Electrostatic discharge immunity test
Radio Frequency Immunity	EN 61000-4-3:2006 + A1:2008 + A2:2010	Electromagnetic Compatibility—Testing and measurement techniques - Radiated radio frequency electromagnetic field immunity test
Electrical Fast Transient Burst Immunity	EN 61000-4-4: 2004+A1: 2010	Electromagnetic Compatibility—Testing and measurement techniques - Electrical fast transient / burst immunity
Power Line Surge Immunity	EN 61000-4-5: 2006	Electromagnetic Compatibility—Testing and measurement techniques - Surge immunity test
RF Common Mode Immunity	EN 61000-4-6: 2009	Electromagnetic Compatibility—Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
Power Frequency Magnetic Field	EN 61000-4-8: 2010	Electromagnetic Compatibility—Testing and measurement techniques - for Power Frequency Magnetic Field, Immunity Test
Voltage Dips and Short Interruptions Immunity	EN 61000-4-11: 2004	Electromagnetic Compatibility—Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests

Nemko USA, Inc.

2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005

**1.4. Test Summary****1.4.1. Emissions Test Summary**

The Compliance Status is a judgment based on the calculated highest emissions to appropriate standard limits. Measurement uncertainty values, provided on calibration certificates, were not be used in the judgment of the final status of compliance.

Test Methods	Frequency Range	Compliance Status
EN 55011:2009+A1:2010, Class "A" Conducted Emissions	0.15 MHz – 30 MHz	N/A
EN 55022: 2010+AC: 2011, Class "A" Telecom Conducted Emissions	0.15 MHz – 30 MHz	PASS
EN 55011:2009+A1:2010, Class "A" Radiated Emissions	30 MHz – 1000 MHz	PASS
EN 61000-3-2: 2006+A1:2009+A2:2009 Power Line Harmonics	up to the 40 th Harmonic	N/A
EN 61000-3-3: 2008 Power Line Flicker	less than or equal to 4% Maximum Relative Voltage Change; Value of D(T) less than or equal to 3% for more than 200 ms	N/A

A handwritten signature in blue ink, reading "Alan Landani".

Senior RF/EMC Engineer
Test Report Verificator

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	8 of 49

Nemko USA, Inc.

2210 Faraday Ave, Suite 150
Carlsbad, CA 92008
Phone (760) 444-3500 Fax (760) 444-3005



1.4.2. Immunity Test Summary

Test Methods	Minimum Criterion Level Required as per EN 61326-1	Criterion Level Tested	Compliance Status
EN 61000-4-2: 2009 - ESD Immunity	Criterion B ±8 kV air discharge, ±4 kV contact discharge	Criterion A ±8 kV Air Discharge, ±4 kV Contact Discharge	PASS
EN 61000-4-3: 2006 +A1:2008 +A2:2010 - Radio Frequency Immunity	Criterion A 10 V/m from 80-1000 MHz 10 V/m from 1.4-2.0 GHz 3 V/m from -2.0-2.7 GHz (80% AM at 1kHz)	Criterion A 10 V/m from 80-1000 MHz 10 V/m from 1.4-2.0 GHz 3 V/m from 2.0-2.7 GHz (80% AM at 1kHz)	PASS
EN 61000-4-4: 2004+A1: 2010 -Electrical Fast Transient Immunity	Criterion B Power line pulses of ± 2 kV; I/O line pulses of ± 1.0 kV	Criterion B Power Line Pulses of ± 2 kV; I/O Line Pulses of ± 1.0 kV	PASS
EN 61000-4-5: 2006 -Surge Immunity	Criterion B ±2kV common mode surges, ±1kV differential mode surges	Criterion B ±2kV Common Mode Surges, ±1kV Differential Mode Surges	N/A*
EN 61000-4-6: 2009 -RF Common Mode Immunity	Criterion A 150 kHz - 80 MHz at 10 Vrms 1 kHz 80% amplitude modulated	Criterion A 150 kHz - 80 MHz at 10 Vrms 1kHz 80% amplitude modulated	PASS
EN 61000-4-8: 2010 Power Frequency Magnetic Field	Criterion A Inductive loop at 50/60 Hz, to 30 amps (rms) per meter	Criterion A Inductive loop at 50/60 Hz, To 30 amps (rms) per meter	PASS
EN 61000-4-11: 2004 - Voltage Dips and Short Interruptions	Criterion B and C Voltage Dips of 30%, 60% and >95%; Interruptions of >95%.	Criterion B and C Voltage Dips of 30%, 60% and >95%; Interruptions of >95%.	N/A

*Not applicable for DC EUT as EUT will be used with a Class 2 power supply per section 8.2 of IEC 61000-4-5, 2005. Surges to low voltage d.c. input/output ports (≤ 60 V) are not applied in the case, when the secondary circuits (isolated from the a.c. mains) are not subject to transient overvoltages (i.e. reliably-grounded, capacitively-filtered d.c. secondary circuits where the peak-to-peak ripple is less than 10 % of the d.c. component.)

Refer to the test results section for further details.

Senior RF/EMC Engineer
Test Report Verificator

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	9 of 49

2. SYSTEM CONFIGURATION

2.1. System Components and Power Cables

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT – Weight Processor	Hardy Process Solutions Model: HI6510-WP-10-EIP Serial #: 4	2m, unshielded, 18 AWG, 2-wire, DC positive and negative wires, ground braid
Support – Bench Scale	Hardy Process Solutions Model: 1212SBU Serial #: 2627	N/A
Support – Laptop Computer	Dell Model: PP05L Serial #: N/A	2m, unshielded, 18 AWG, 2-wire, 1EC connector

2.2. Device Interconnection and I/O Cables

Connection	I/O Cable
EUT to Bench Scale	Load Cell Cable, shielded, 20ft
EUT to Laptop computer	RJ45 Cable, unshielded, 3ft
EUT to Laptop computer	RS485 Cable, shielded, 20ft, to USB Cable, shielded, 3ft

2.3. Description and Method of Exercising the EUT

The HI6510-WP-10-EIP is a Weight Processor. Its function is to be used as a stand-alone weight processor or for front-end to weight-based control systems. The instruments read, condition, and digitize load cell and strain gage signals commonly found in industrial process weighing applications, including inventory management, batching, blending, filling, dispensing, and check weighing. The EUT was exercised by a continuously running program. If the program is disrupted, or there is loss of functionality, this may be considered a failure. The EUT was monitored by a laptop running HI6500 1.0.0.16 software where weight readings are displayed in real time. The fail mode for the EUT is when it loses communication with the laptop or there is weight change of +/- 1.5 grams or more. The HI6510-WP-10-EIP has HI6500 1.0.0.16 program used during the EMI evaluation.

The EUT's performance during test was evaluated against the performance criterion specified by applicable test standards. Performance results are detailed in the test results section of this report.

2.4. Design Modifications for Compliance

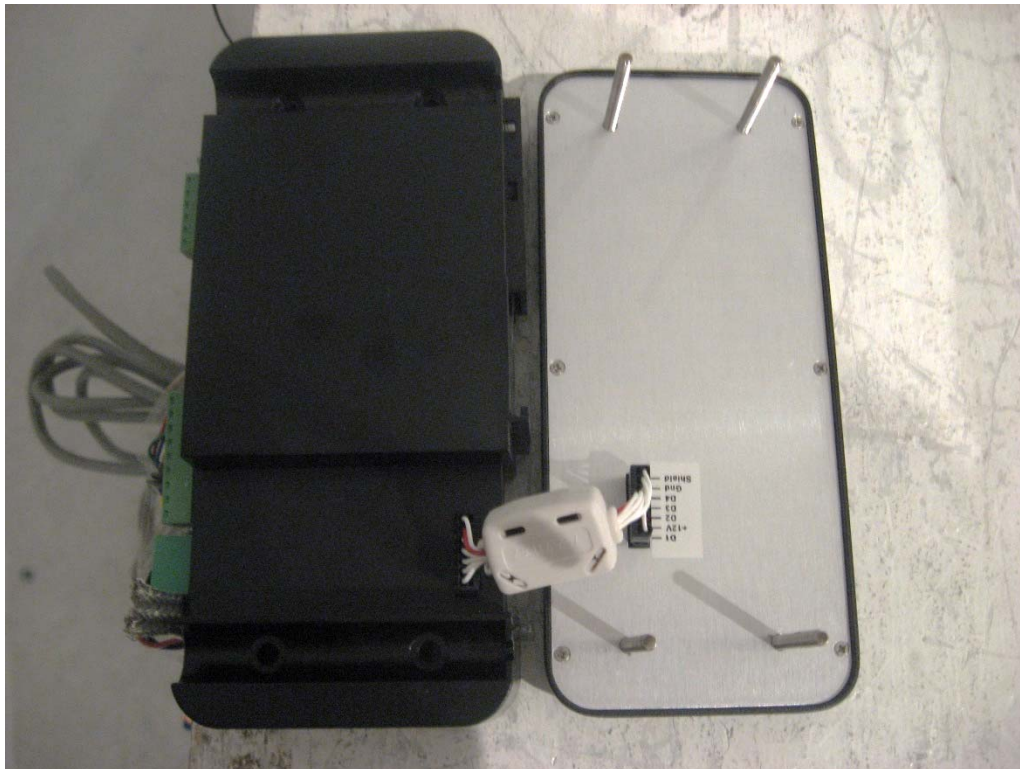
Device: Weight Processor
Model: HI6510-WP-10-EIP

The following design modifications were made to the EUT during testing.

For Radiated Emissions:

Added 1 Ferrite, Manufacturer: Wurth Elektronik, Serial Number: 742 711 42, internally to display cable.

Photograph 1. Photo of Radiated Emissions Modification



3. Models Represented

The HI6300/HI6500 Series of Weight Processor consist of the following models, which according to Manufacturer, are all based on the same design and configuration:

Per manufacturer, models **HI6510-WP-10-EIP** and **HI6500-WP-10-PB** were selected as worst case representative of all models.

Standard Hardware Configuration:

HI6300 Ethernet Port, Modbus-RTU, RS232/RS485

HI6310 Ethernet Port, Modbus-RTU, RS232/RS485, USB Port, Analog Output (4-20mA)

HI6500 Ethernet Port, Modbus-RTU, RS232/RS485, USB Port

HI6510 Ethernet Port, Modbus-RTU, RS232/RS485, USB Port, Analog Output (4-20mA)

Product Nomenclature:

Series Models	Application Software	Display Options	Network Options
HI6300	-WP (Weight Processor)	-00 (No Display) -10 (With Display)	-00 (No Network)

Series Models	Application Software	Display Options	Network Options
HI6310	-WP (Weight Processor)	-00 (No Display) -10 (With Display)	-00 (No Network)

Series Models	Application Software	Display Options	Network Options
HI6500	-WP (Weight Processor)	-00 (No Display) -10 (With Display) -20 (With Color Display)	-00 (No Network) -EIP (Ethernet IP) -PB (Profibus-DP)

Series Models	Application Software	Display Options	Network Options
HI6510	-WP (Weight Processor)	-00 (No Display) -10 (With Display) -20 (With Color Display)	-00 (No Network) -EIP (Ethernet IP) -PB (Profibus-DP)

Photograph 2.EUT Front and Rear

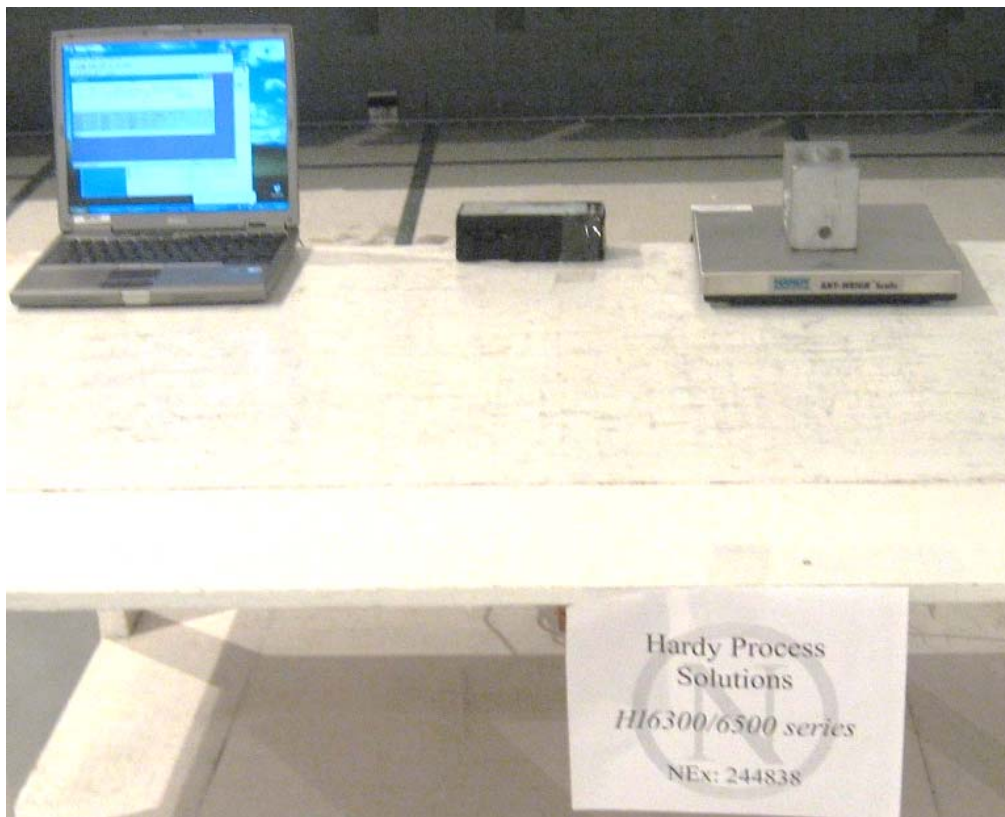
EUT Front



EUT Rear



Photograph 3. General EUT Test Configuration



DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	14 of 49

4. DESCRIPTION OF TEST SITE

4.1. Description of Test Site

The test site is located at 2210 Faraday Ave., Suite 150, Carlsbad, CA 92008. Radiated emissions measurements are performed in the 10 meter Semi-Anechoic chamber, which conforms to the volumetric normalized site attenuation (VNSA) for three and ten-meter measurements. The chamber also conforms to the SVSWR compliance requirements for 1-18 GHz measurements. The VNSA and SVSWR meet the technical requirements, as set, in the CISPR 16 and ANSI C63.4 documents. Facility test areas for conducted emissions and immunity testing also meet the construction and characteristics, as required by CISPR 16 and ANSI C63.4 documents.

Emissions measurements are performed using TILE software. Version 4.0.A.7 for radiated and version 3.4.K.24 for conducted.

4.2. Test Site Registrations

Organization	Registration and Recognition numbers
Federal Communications Commission	0013750831 / US5058
Industry Canada	2040B-3
VCCI	R-3856 / G-549 (Radiated emissions) and C-4320 / T-1315(Conducted emissions)
Korean Ministry (APEC Tel MRA)	US0088

5. DESCRIPTION OF TESTING METHODS

5.1. Introduction

Nemko USA, Inc. is accredited to ISO/IEC 17025 by the National Voluntary Laboratory Accreditation Program (NVLAP) for Electromagnetic Compatibility and Telecommunications testing. Part of the accreditation process involves the demonstration of competence in various test methods.

Prior to the beginning of work, Nemko personnel work with their clients to ensure the proper test standards and test methods are utilized. Applicable tests and the minimum criteria for a pass condition are listed in the administrative section of this report.

5.2. Test Methods

The harmonized documents published for Information Technology Equipment are EN 55022: 2010+AC: 2011 for radio frequency emissions and EN 55024: 2010 for electromagnetic immunity. The methods employed to test the emissions and immunity characteristics of the Equipment Under Test are those mandated by the European Standards EN 55022 and EN 55024. The applicable tests and the minimum criteria for a pass condition that are listed in the administrative section of this report are taken from these standards.

Digital devices sold in Canada are required to comply with the Interference Causing Equipment Standard for Digital Apparatus, ICES-003, Issue 5, Dated August 2012. These test methods and limits are specified in the Canadian Standards Association's Standard CAN/CSA-CISPR 22-10 and are "essentially equivalent" with the CISPR 22 (EN55022) rules for unintentional radiators.

5.3. Configuration and Methods of Measurements for Conducted Emissions

This test measures the levels emanating from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices. Testing was performed in accordance with the test standard(s) referenced in the test summary section of this report. The Equipment Under Test (EUT) was configured based upon the requirements of the applicable test standard.

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	16 of 49

5.4. Configuration and Methods of Measurements for Radiated Emissions

This test measures the levels emanating from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices. Testing was performed in accordance with the test standard(s) referenced in the test summary section of this report. The Equipment Under Test (EUT) was configured based upon the requirements of the applicable test standard. Initial prescans for radiated emissions were performed as suggested per ANSI 63.22. The antenna is positioned at several heights while the EUT is rotated 360°. At each antenna height, the receiver scans and records the maximum emissions in the required frequency range as required by the applicable standards. From the recorded scans, a list of discrete frequencies is developed. To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to produce horizontal and vertical polarities while the turntable is rotated to determine the worst emitting configuration. The numerical results are included herein to demonstrate compliance. The numerical results of the test are included herein to demonstrate compliance.

The numerical results that are applied to the emissions limits are arrived as demonstrated by the example below:

The numerical results that are applied to the emissions limits are arrived as demonstrated by the example below:

A	B	C	D	E	F	G	H	I
Measurement Frequency (MHz)	Meter Reading (dBμV)	Turn Table (degrees)	Antenna Height (cm)	Corrected Reading (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pass Fail	Comments

A. Frequency Measured in MHz

B. Meter Reading: Emission Amplitude as measured with the antenna in dBμV, this is from the EMI receiver or Spectrum Analyzer.

C. Turn Table reading in degrees.

D. Antenna Height in centimeters.

E. Corrected Reading, the meter reading with the antenna factor, cable loss, attenuator loss, and preamplifier gain added in. This is the emission value to compare to the limit.

F. Limit from the specification.

G. Margin: difference in dB of Corrected Reading and Specification Limit, negative results indicate a margin value below the specification limit.

H. Pass Fail: Result; EUT does or does not comply at this frequency.

I. Comments. If any, the technician enters remarks special to the test performed.

5.5. Power Line Harmonics: EN 61000-3-2: 2006+A1:2009+A2:2009

This test evaluates the potential for the EUT to cause distortion on the AC power lines. Testing was performed in accordance with EN 61000-3-2. It is applicable to electrical and electronic equipment having an input current up to and including 16 amps per phase, and intended to be connected to public low-voltage distribution systems.

Basic requirements of the AC source include a $\pm 2\%$ voltage regulation and a $\pm 0.5\%$ frequency limit. A low distortion sine wave output is required to ensure that the AC source does not adversely contribute distortion to the load, meeting the following limits:

- o 0.9% for 3rd order harmonics
- o 0.4% for 5th order harmonics
- o 0.3% for 7th order harmonics
- o 0.2% for 9th order harmonics
- o 0.2% for even harmonics of order 2 to 10
- o 0.1% for odd harmonic order from 11 to 40

For further information, please refer to the technical sections in the EN 61000-3 in addition to the test results section and photographs of the test set-up provided in this report.

5.6. Power Line Fluctuations/Flicker: EN 61000-3-3: 2008

Testing was performed in accordance with EN 61000-3-3. It is applicable to household appliances and similar electrical and electronic equipment having an input current up to and including 16 amps per phase. The objective of this standard is to set limits for voltage fluctuations of equipment within its scope, and ensures that home appliances and certain other electrical equipment do not adversely affect lighting equipment when connected to the same utility power line. Large current variations combined with high utility line power impedance can cause excessive changes in the AC supply voltage. If these voltage changes are repeated at short intervals, objectionable fluctuations of luminance (flicker) could be generated in illumination sources connected to the same utility line network.

This test requires an AC power source with a standard impedance network and a power analyzer. Measurements of steady state and fluctuating harmonics, along with flicker and voltage deviations, are conducted using a power analyzer, often called a “flickermeter.”

For further information, please refer to the technical sections in the EN 61000-3-3 in addition to the test results section and photographs of the test set-up provided in this report.

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	18 of 49



5.7. Device Performance Criteria for Immunity Tests

- o **Criterion A** - The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
- o **Criterion B** - During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. After the test, the equipment shall continue to operate as intended without operator intervention. The performance level may be replaced by a permissible loss of performance. If the manufacturer does not specify the minimal performance level (or the permissible performance loss), then either of these may be derived from the product description and documentation, or by what the user may reasonably expect from the equipment if used as intended.
- o **Criterion C** - Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

For each test method, the test standard specifies the appropriate criterion to be met.

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	19 of 49

5.8. Electrostatic Discharge Immunity: EN 61000-4-2: 2009

This test simulates electrostatic events (similar to being “zapped” by touching a light switch) and evaluates the ability of the EUT to tolerate such events. Testing was performed in accordance with IEC 61000-4-2. Tabletop devices are placed on an insulated mat on a horizontal coupling plane. Air discharges and contact charges are made to the EUT on connectors and conducting surfaces (as illustrated in the Test Results section of this Test Report). The discharges shall be applied in two ways:

a) Contact Discharges to the conductive surfaces and to coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points (a minimum of 50 discharges at each point). One of the test points shall be subjected to at least 50 indirect discharges (contact) to the center of the front edge of the horizontal-coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode.

b) Air Discharge at slots and apertures, and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. This investigation should be restricted to those areas normally handled by the user. A minimum of 10 single air discharges of each polarity and test level shall be applied to the selected test point for each area.

For further information, please refer to the technical sections in the IEC 61000-4-2 publication in addition to the test results section and photographs of the test set-up provided in this report.

5.9. Radio Frequency Immunity: EN 61000-4-3: 2006 +A1:2008 +A2:2010

This test bombards the EUT with electric fields that may couple into the system via chassis slots and interface cables and evaluates the product's immunity. Testing was performed in accordance with IEC 61000-4-3. The RF immunity test entails subjecting the equipment under test to a uniform field of radiated electromagnetic energy of a specified field strength and frequency, and monitoring the functionality of the device as the frequency is swept over a specified frequency range.

The EUT is set up inside a shielded, semi-anechoic chamber with a radiating antenna at a distance of 3 meters from the EUT. The antennas used for radiating have a VSWR characteristic of 2:1 or better, Per CISPR16.

For further information, please refer to the technical sections in the IEC 61000-4-3 publication in addition to the test results section and photographs of the test set-up provided in this report.

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	20 of 49

5.10. Electrical Fast Transient Immunity: EN 61000-4-4: 2004+A1: 2010

This test injects a transient/burst interference onto the AC/DC power supply and signal I/O lines. Testing was performed in accordance with IEC 61000-4-4. The standard configuration for “type tests” outlined in IEC 61000-4-4 is used. For further information, please refer to the technical sections in the IEC 61000-4-4 in addition to the test results section and photographs of the test set-up provided in this report.

5.11. Power Line Surge Immunity: EN 61000-4-5: 2006

This test simulates a lightning event by inducing transients onto the AC/DC power supply lines in common and differential mode. Testing was performed in accordance with IEC 61000-4-5.

Each device was tested in a total of three surge configurations:

Surge #1: Combination Wave, Line to Protective Earth with 9uF and 10Ohm, common mode, generator earthed.

Surge #2: Combination Wave, Neutral to Protective Earth with 9uF and 10Ohm, common mode, generator earthed.

Surge #3: Combination Wave, Line to Neutral with 18uF, differential mode, and generator floated.

For further information, please refer to the technical sections in the IEC 61000-4-5 in addition to the test results section and photographs of the test set-up provided in this report.

5.12. Radio Frequency Conducted Common Mode Immunity: EN 61000-4-6: 2009

This test injects a disturbance directly onto AC/DC power and signal I/O cables. Testing was performed in accordance with IEC 61000-4-6. The standard configuration as outlined in the IEC 61000-4-6 was used. For further information, please refer to the technical sections of the IEC 61000-4-6 publication in addition to the test results section and photographs of the test set-up provided in this report.

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	21 of 49

5.13. Power Frequency Magnetic Field Immunity: EN 61000-4-8: 2010

This test subjects devices to the fields produced by current carrying conductors of standard building power. Testing was performed in accordance with IEC 61000-4-8. The standard configuration as outlined in IEC 61000-4-8 was used. For further information, please refer to the technical sections of IEC 61000-4-8 in addition to the test results section and photographs of the test set-up provided in this report.

5.14. Voltage Dips and Short Interruptions: EN 61000-4-11: 2004

This test subjects the EUT to power network faults and “brownouts”. Testing was performed in accordance with IEC 61000-4-11. The standard configuration as outlined in the IEC 61000-4-11 was used. The EUT is powered up to a nominal voltage of 230 VAC 50 Hz, and then software-controlled voltage dips and interruptions are introduced. For further information, please refer to the technical sections of the IEC 61000-4-11 in addition to the test results section and photographs of the test set-up provided in this report.

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	22 of 49

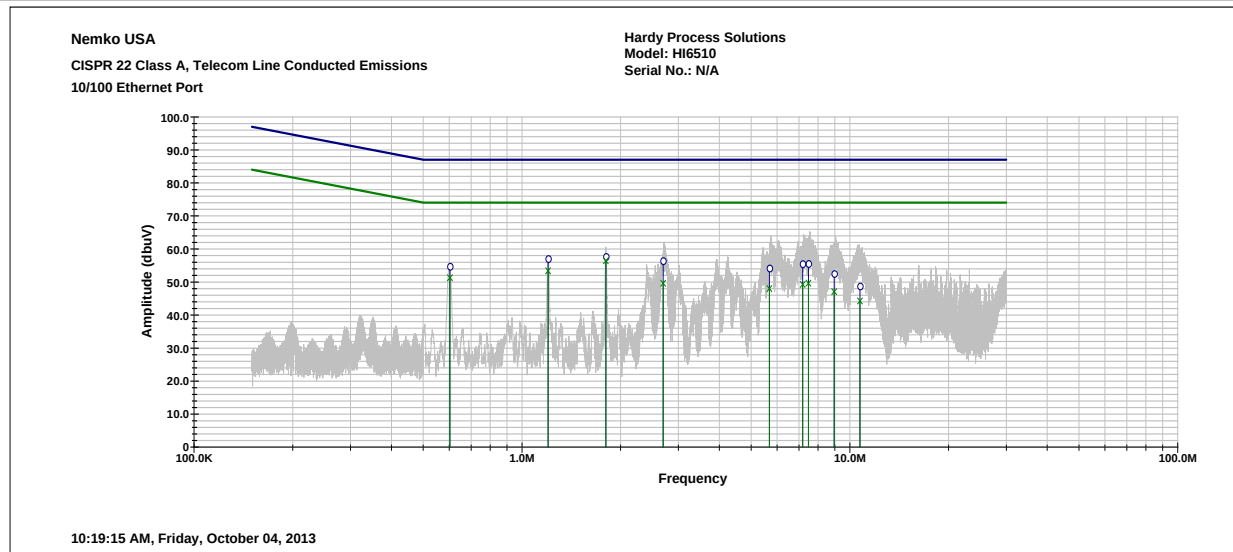
Nemko USA, Inc.

2210 Faraday Ave, Suite 150
Carlsbad, CA 92008
Phone (760) 444-3500 Fax (760) 444-3005



5.15.Telecom Conducted Emissions Test Data

Client	Hardy Process Solutions	Temperature	23	°C
NEx #:	244838	Relative Humidity	58	%
EUT Name	Weight Processor	Barometric Pressure	100.6	kPa
EUT Model	HI6510-WP-10-EIP	Test Location	Ground Plane 3	
Governing Doc	EN 55022	Test Engineer	William Dey	
Basic Standard	CISPR 22	Date	4 October 2013	
Voltage:	24 VDC			



Frequency (kHz)	Measured		Limit		Margin	
	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
603.193	54.8	51.3	87	74	-32.2	-22.7
1201.85	57.1	53.4	87	74	-29.9	-20.6
1801.71	57.7	56.4	87	74	-29.3	-17.6
2693.57	56.4	49.6	87	74	-30.6	-24.4
5680.97	54.2	48	87	74	-32.8	-26.0
7174.02	55.5	49.2	87	74	-31.5	-24.8
7473.19	55.6	49.6	87	74	-31.4	-24.4
8955.64	52.6	47.1	87	74	-34.4	-26.9

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	23 of 49

Nemko USA, Inc.

2210 Faraday Ave, Suite 150
Carlsbad, CA 92008
Phone (760) 444-3500 Fax (760) 444-3005



5.16. Radiated Emissions Test Data

Radiated Emissions Graphical Data

Client	Hardy Process Solutions	Temperature	23	°C
NEx #:	244838	Relative Humidity	55	%
EUT Name	Weight Processor	Barometric Pressure	100.7	kPa
EUT Model	HI6510-WP-10-EIP	Test Location	10m Chamber	
Governing Doc	EN 55011	Test Engineer	William Dey	
Basic Standard	CISPR 11	Date	2 October 2013	
Test Mode:	Weight Processing	Voltage:	24 VDC	

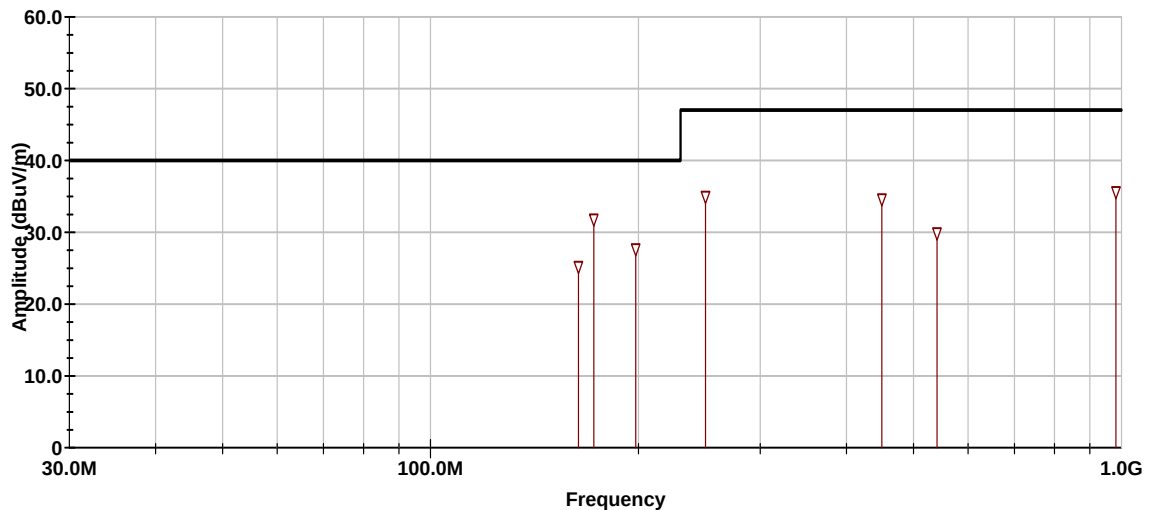
Hardy Process Solutions
Model: HI6510-EIP
Shield over to laptop
Ferrite on Display Cable

NEMKO USA, Inc - Carlsbad, CA

10 Meter Semi-Anechoic Chamber

Final QP Results (Vert & Horiz)

Limit
▽ Vertical QP Final
□ Horizontal QP Final



HI6510 Shield over to Lap and Ferrite on Disp.TIL

02:54:51 PM, Wednesday, October 02, 2013

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	24 of 49



Radiated Emissions Tabular Data

Vertical

Measurement Frequency (MHz)	QP Measured (dBμV)	Adjustments (dBm)	Turn Table (degrees)	Antenna Height (cm)	Corrected Reading	Limit (dBμV/m)	Margin (dBμV/m)	Pass Fail
163.667	42.7	-17.5	3	115	25.2	40	-14.8	Pass
172.324	49	-17.2	72	110	31.8	40	-8.2	Pass
198.127	43.6	-15.9	6	110	27.7	40	-12.3	Pass
250.024	52.3	-17.4	358	112	35	47	-12	Pass
449.979	46.5	-11.9	301	109	34.6	47	-12.4	Pass
540.776	40.4	-10.6	130	110	29.9	47	-17.1	Pass
981.863	37.4	-1.7	6	189	35.6	47	-11.4	Pass

No Horizontal emissions within 20 dB of the Limit

Calculation:

Meter Reading + antenna factor + cable loss – preamplifier = Corrected Reading

(Antenna factor, cable loss, preamplifier values are not listed.)

Corrected Reading – Spec. Limit = Margin

Negative Margin indicates passing emissions.

Meter Readings are Quasi-Peak maximum hold for turntable direction and antenna height.

Nemko USA, Inc.

2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005

**Conducted Disturbance Voltage Emissions Test Equipment**

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
811	Multimeter	Fluke	111	78130057	20-Feb-2013	20-Feb-2014
945	Temp/Humidity Indicator	Davis Instruments	7400	PC00502A16	15-Jan-2013	15-Jan-2014
E1017	9kHz to 7GHz Spectrum Analyzer	Rohde & Schwarz	FSP7	839337/0022	18-Jun-2013	18-Jun-2014
E1032	CISPR 22: Balanced Telecom ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02-09,	112254	04-Feb-2013	04-Feb-2014
E1019	Two Line V-Network	Rohde & Schwarz	ENV216	101045	13-Apr-2013	13-Apr-2014

Radiated Emissions Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
111	Antenna, LPA	EMCO	3146	1382	09-Jan-2013	09-Jan-2014
811	Multimeter	Fluke	111	78130057	20-Feb-2013	20-Feb-2014
901	Preamplifier	Sonoma	310 N	130607	15-Oct-2012	15-Oct-2013
945	Temp/Humidity Indicator	Davis Instruments	7400	PC00502A16	15-Jan-2013	15-Jan-2014
E1046	Biconical Antenna	A.H. Systems Inc.	SAS-540	736	22-Apr-2013	22-Apr-2014

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	26 of 49

Nemko USA, Inc.

2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005



5.18. Electrostatic Discharge Immunity Test Results & Test Points

Electrostatic Discharge Immunity Test						
Client:	Hardy Process Solutions	Temperature:	23	°C		
NEx #:	244838	Relative Humidity:	55	%		
EUT Name:	Weight Processor	Barometric Pressure:	100.5	kPa		
EUT Model:	HI6510-WP-10-EIP	Test Location	ESD Room			
Governing Doc:	EN61326-1	Test Engineer	William Dey			
Basic Standard:	IEC 61000-4-2	Date:	7 October 2013			
Test Voltage:	24 VDC	Photo:	☒			
TEST CONDITIONS						
Discharge Rep. Rate	☒ ≥ 1 per second					
Number of Discharges	☒ ≥ 10 per location					
Performance Criteria:	A					
EUT Mode:	Weight Processing during test, Susceptibility Requirement +/- 1.5 grams					
CONTACT DISCHARGE						
Voltage: (+/- kV)	☒ 2	☒ 4				
Location	Comments					
Vertical Coupling Plane	No susceptibility noted.					
Horizontal Coupling Plane	No susceptibility noted.					
Contact Locations	No susceptibility noted.					
AIR DISCHARGE						
Voltage: (+/- kV)	☒ 2	☒ 4	☒ 8			
Location	Comments					
Air Locations	No susceptibility noted.					
"Spark" event(s)	No Spark events.					
Compliant	☒					
Non-Compliant	☐					
ELECTRO STATIC DISCHARGE TEST EQUIPMENT						
Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
811	Multimeter	Fluke	111	78130057	20-Feb-2013	20-Feb-2014
818	ESD Gun	Schaffner	NSG-435	5111	27-Nov-2012	27-Nov-2013
E1044	Temp Humidity Meter	Davis Instruments	7400	PE80513A01	06-Dec-2012	06-Dec-2013

Figure 1.ESD Test Points



Contact Discharges =



Air Discharges =

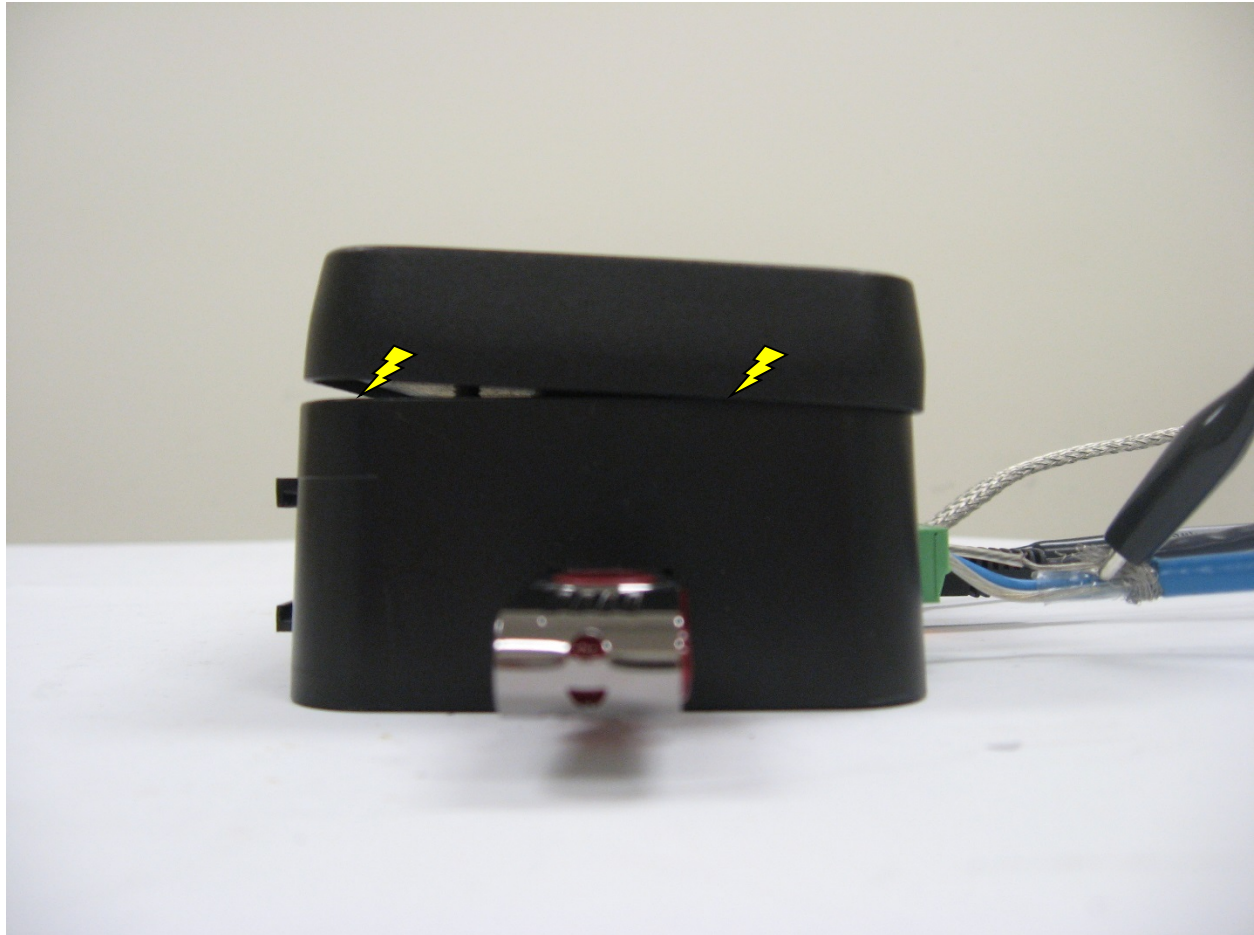


Figure 2.ESD Test Points



Contact Discharges = 
Air Discharges = 

Figure 3.ESD Test Points



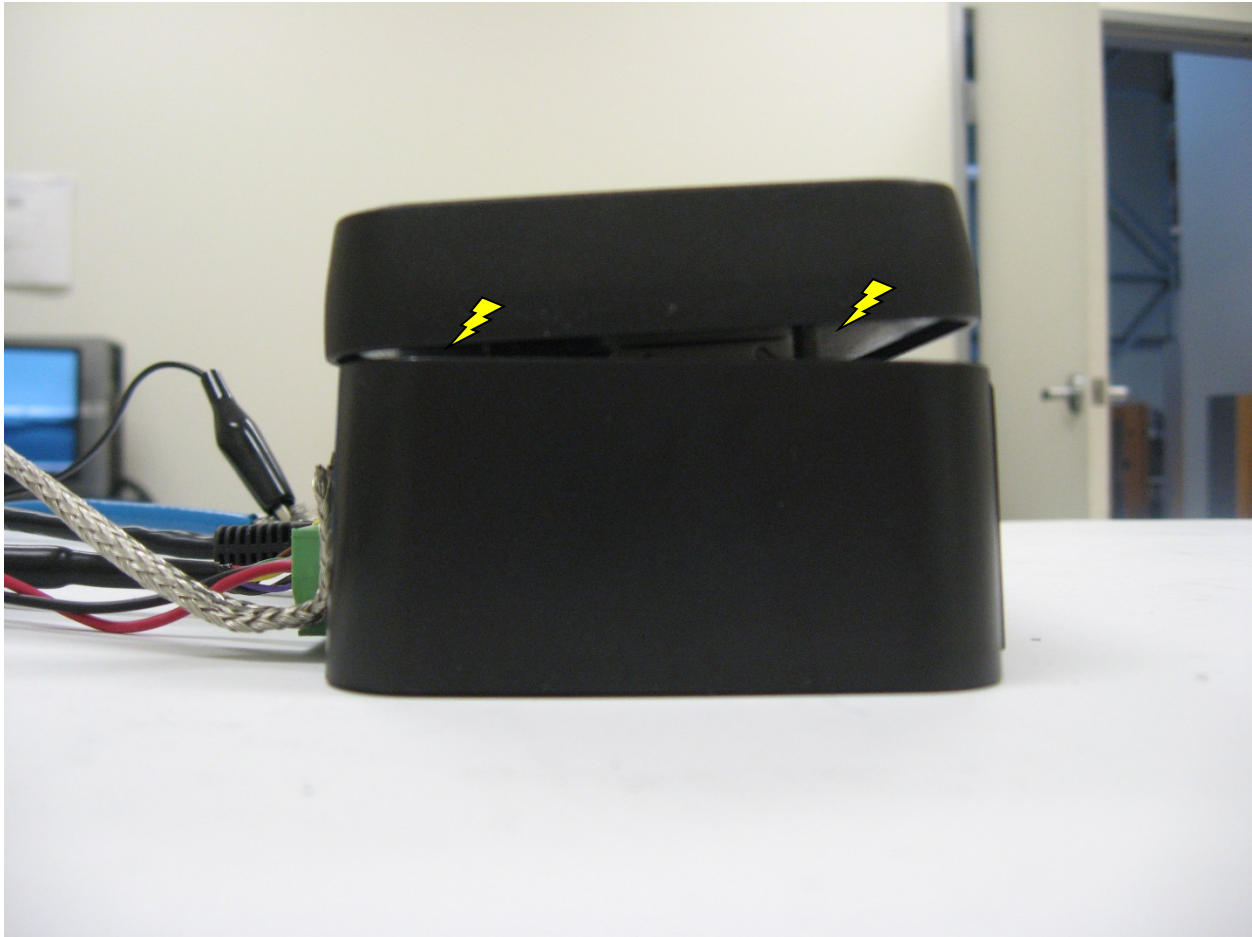
Contact Discharges =



Air Discharges =



Figure 4.ESD Test Points



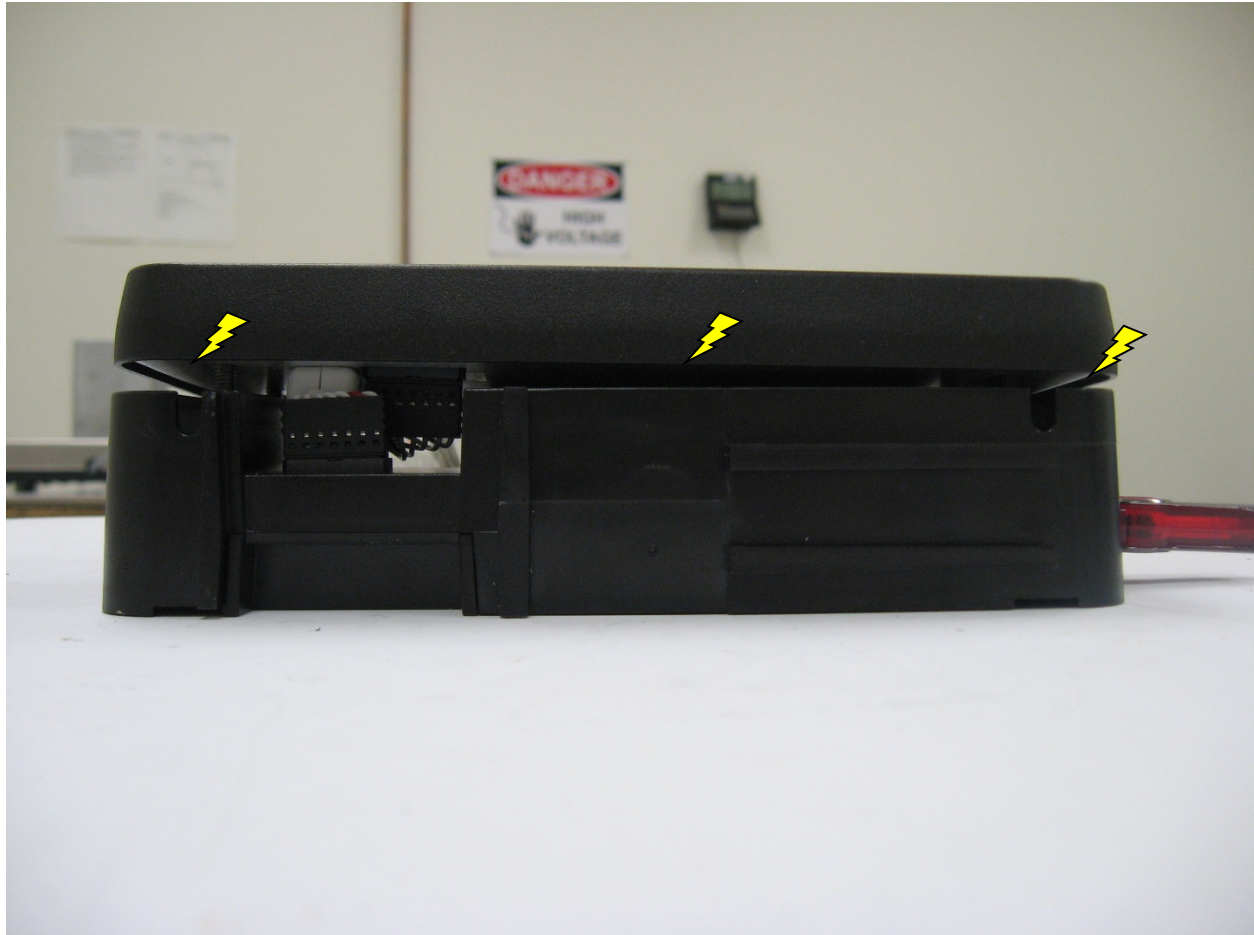
Contact Discharges =



Air Discharges =

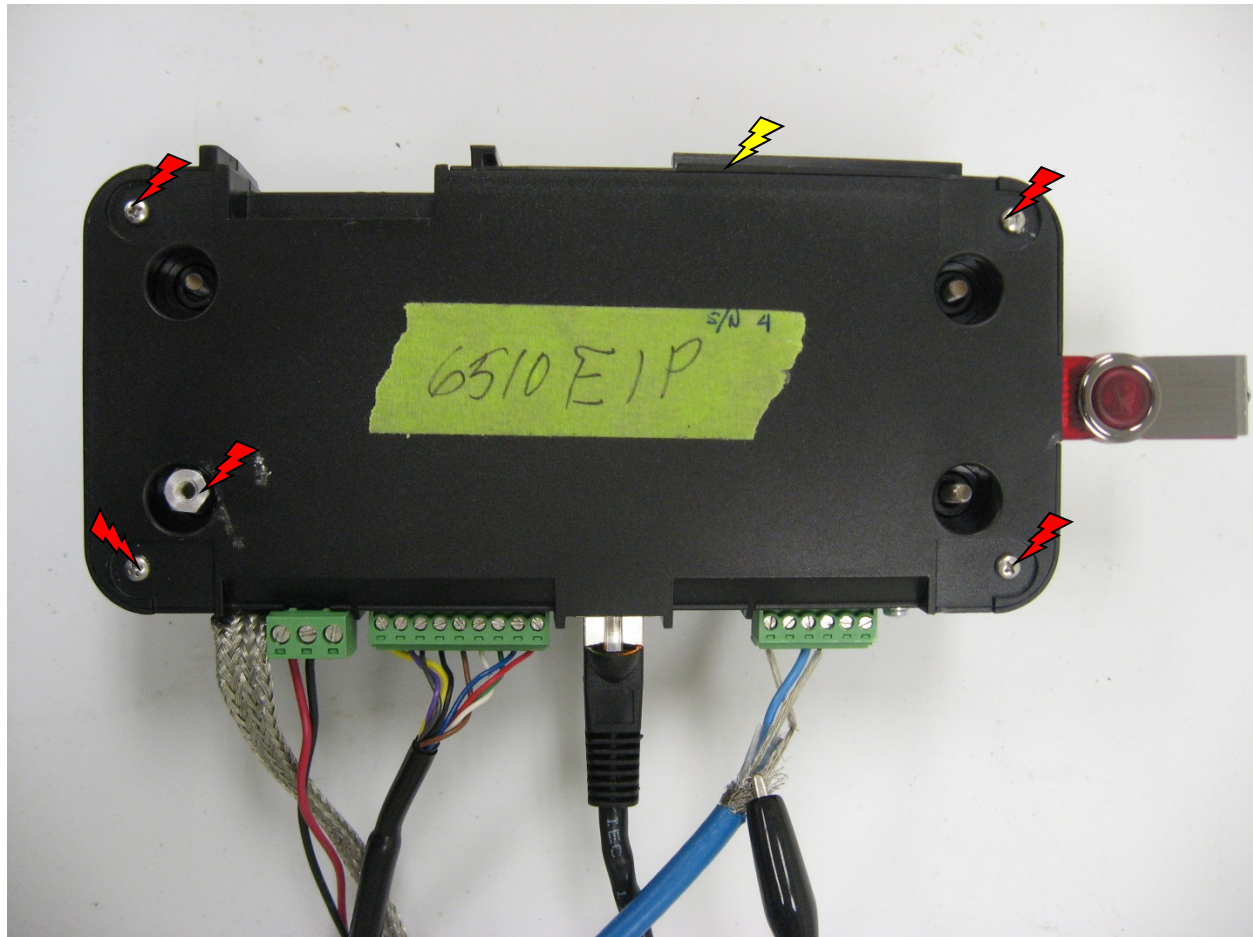


Figure 5.ESD Test Points



Contact Discharges = 
Air Discharges = 

Figure 6.ESD Test Points



Contact Discharges =



Air Discharges =



5.19. Radio Frequency Immunity Test Results

Radio Frequency Immunity Test						
Client:	Hardy Process Solutions			Temperature:	23 °C	
NEx #:	244838			Relative Humidity:	55 %	
EUT Name:	Weight Processor			Barometric Pressure:	100.5 kPa	
EUT Model:	HI6510-WP-10-EIP			Test Location	RFI Chamber	
Governing Doc:	EN61326-1			Test Engineer	William Dey	
Basic Standard:	IEC 61000-4-3			Date:	3 October 2013	
Test Voltage:	24 VDC			Photo:	☒	
Test Conditions						
Test Level:	3 V/m					
Frequency Swept:	80 to 2700 MHz					
Selected Frequencies:	N/A					
Modulation:	80 % Depth, 1 kHz AM Modulation					
Frequency Step:	1 %					
Dwell Time:	3 seconds					
Performance Criteria:	A					
EUT Mode:	Weight Processing during test, Susceptibility Requirement +/- 1.5 grams					
Test Scans Accomplished						
Frequency (MHz)	Antenna Polarization		Compliant		Orientation F: Front R: Rear SL: Side, Left SR: Side, Right	Comments
	H	V	Y	N		
80-200	☒	☒	☒		F	No susceptibility noted.
80-200	☒	☒	☒		R	No susceptibility noted.
80-200	☒	☒	☒		SL	No susceptibility noted.
80-200	☒	☒	☒		SR	No susceptibility noted.
200-1000	☒	☒	☒		SR	No susceptibility noted.
200-1000	☒	☒	☒		SL	No susceptibility noted.
200-1000	☒	☒	☒		R	No susceptibility noted.
200-1000	☒	☒	☒		F	No susceptibility noted.
1000-2700	☒	☒	☒		F	No susceptibility noted.
1000-2700	☒	☒	☒		R	No susceptibility noted.
1000-2700	☒	☒	☒		SL	No susceptibility noted.
1000-2700	☒	☒	☒		SR	No susceptibility noted.
		Additional Comments:				
Compliant	☒	No susceptibility noted.				
Non-Compliant	☐					

Nemko USA, Inc.

2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005

**Radio Frequency Immunity Test Equipment**

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
372	Antenna, Dual Ridge	Electro-Metrics	RGA 25	2225	05-Nov-2012	05-Nov-2014
811	Multimeter	Fluke	111	78130057	20-Feb-2013	20-Feb-2014
740	RF Amplifier	Amplifier Research	500W1000M5	23680	N/R	N/R
743	RF Amplifier	Amplifier Research	200T1G3M3 (800 to 28	19649	N/R	N/R
EA2466	Biconical Antenna	EMCO	3109	9403-2801	N/R	N/R
728	Microwave Horn Antenna	Amplifier Research	AT4002A (0.8MHz to 5GHz)	23811	N/R	N/R
RENTED	Signal Generator	Agilent	N9310A	CN0115000228	6-Dec-2013	6-Dec-2014

Antennas

Nemko ID	VSWR	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
EA 2466	1.9:1	EMCO	3109	9403-2801	NCR	NCR
728	2.0:1	Amplifier Research	DC7140	23726	NCR	NCR
372	2.0:1	Electro-Metrics	RGA-25	2225	05-Nov-2012	05-Nov-2014

DATE**October 11, 2013****DOCUMENT NAME**Hardy Process Solutions - **HI6510-WP-10-EIP - EMC Test Report****DOCUMENT #****2013 10244838 EMC****PAGE****35 of 49**

Nemko USA, Inc.

2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005



5.20. Electrical Fast Transient Burst Immunity Test Results

Electrical Fast Transient Burst Immunity Test

Client	Hardy Process Solutions	Temperature	23	°C
NEx #:	244838	Relative Humidity	58	%
EUT Name	Weight Processor	Barometric Pressure	100.6	kPa
EUT Model	HI6510-WP-10-EIP	Test Location	Ground Plane	
Governing Doc	EN61326-1	Test Engineer	William Dey	
Basic Standard	IEC 61000-4-4	Date	4 October 2013	
Test Voltage:	24 VDC	Photo:	☒	

Test Conditions

Power Port:	DC Mains
Highest Power Port Test Level:	2.0 kV
Highest Signal Port Test Level:	1.0 kV
Test Duration:	61 Seconds
Burst:	5 kHz
Performance Criteria:	B
EUT Mode:	Weight Processing during test, Susceptibility Requirement +/- 1.5 grams

Direct Injection Output Path DC Mains

Test Level	L1	L2	Comments
+/- 2.0kV	☒		Susceptibility noted. EUT loses communication with support CPU, yet still operates normally during and after the test
+/- 2.0kV		☒	Susceptibility noted. EUT loses communication with support CPU, yet still operates normally during and after the test
+/- 2.0kV	☒	☒	Susceptibility noted. EUT loses communication with support CPU, yet still operates normally during and after the test

Cable Description (Clamp Injection)

+/- 1.0kV	Load Cell Cable, shielded, 20ft	Susceptibility noted. EUT loses communication with support CPU, yet still operates normally during and after the test
+/- 1.0kV	Ethernet RJ45 Cable, unshielded, 9ft	Susceptibility noted. EUT loses communication with support CPU, yet still operates normally during and after the test
+/- 1.0kV	RS485 Cable, shielded, 20ft, to USB Cable, shielded, 3ft	Susceptibility noted. EUT loses communication with support CPU, yet still operates normally during and after the test

Additional Comments:

Compliant	☒	Susceptibility noted. EUT loses communication with support CPU, yet still operates normally during and after the test. EUT meets Class B Criteria.
Non-Compliant	☐	

EFT Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
811	Multimeter	Fluke	111	78130057	20-Feb-2013	20-Feb-2014
845	Multi-Generator	EMC Partner	TRA2000	680	24-Jan-2013	24-Jan-2014
E1015	Capacitive Coupling Clamp	Haefely	093 506.1	083 874 -08	N/R	N/R
945	Temp/Humidity Indicator	Davis Instruments	7400	PC00502A16	15-Jan-2013	15-Jan-2014

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	36 of 49

Nemko USA, Inc.

2210 Faraday Ave, Suite 150
Carlsbad, CA 92008
Phone (760) 444-3500 Fax (760) 444-3005



5.21. RF Conducted Common Mode Disturbance Immunity Test Results

Client	Hardy Process Solutions	Temperature	23	°C
NEx #:	244838	Relative Humidity	44	%
EUT Name	Weight Processor	Barometric Pressure	100.6	kPa
EUT Model	HI6510-WP-10-EIP	Test Location	Ground Plane	
Governing Doc	EN61326-1	Test Engineer	William Dey	
Basic Standard	IEC 61000-4-6	Date	7 October 2013	
Test Voltage:	24 VDC	Photo:	☒	

Test Conditions

Test Level:			3 V		
Modulation:			80 % Depth, 1 kHz AM Modulation		
Frequency Range:			0.15 to 80 MHz		
Selected Frequencies:			N/A		
Step:			1 %		
Dwell Time:			3 seconds		
Performance Criteria:			A		
EUT Mode:			Weight Processing during test, Susceptibility Requirement +/- 1.5 grams		
1	Injection Point	DC Mains		Injection Method: ☐ Clamp ☒ CDN	
Comments:		No susceptibility noted.			
2	Injection Point	Load Cell Cable, shielded, 20ft		Injection Method: ☒ Clamp ☐ CDN	
Comments:		No susceptibility noted.			
3	Injection Point	Ethernet RJ45 Cable, unshielded, 9ft		Injection Method: ☒ Clamp ☐ CDN	
Comments:		No susceptibility noted.			
4	Injection Point	RS485 Cable, shielded, 20ft, to USB Cable, shielded, 3ft		Injection Method: ☒ Clamp ☐ CDN	
Comments:		No susceptibility noted.			
		Additional Comments			
Compliant		☒	No susceptibility noted.		
Non-Compliant		☐			

Conducted Immunity Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
948	Signal Generator	Hewlett Packard	8657A	3430U02365	10-Jan-2013	10-Jan-2014
628	CDN	FCC	FCC-801-M4-25	97-03	10-Jul-2013	10-Jul-2014
472	CDN	FCC	FCC-801-M2-25	24	17-Jul-2013	17-Jul-2014
913	Amplifier	EIN	3100L	103	NCR	NCR
810	Multimeter	Fluke	111	77820242	10-Apr-2013	10-Apr-2014

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	37 of 49

Nemko USA, Inc.

2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005



5.22. Power Frequency Magnetic Field Immunity

Client:	Hardy Process Solutions	Temperature	23	°C
NEx #:	244838	Relative Humidity	55	%
EUT Name:	Weight Processor	Barometric Pressure	100.5	kPa
EUT Model:	HI6510-WP-10-EIP	Test Location	Ground Plane	
Governing Doc:	EN61326-1	Test Engineer	William Dey	
Basic Standard:	IEC 61000-4-8	Date	7 October 2013	
Test Voltage:	24 VDC	Photo:	☒	

Test Conditions

Threat Level:	30 A/m
Frequency:	50 and 60 Hz
Duration Per Axis:	5 Minutes
Performance Criteria:	A
EUT Mode:	Weight Processing during test, Susceptibility Requirement +/- 1.5 grams

Test Axis	Compliant		Comments
	Y	N	
X	☒	☐	No susceptibility noted.
Y	☒	☐	No susceptibility noted.
Z	☒	☐	No susceptibility noted.

Additional Comments:

Compliant	☒	No susceptibility noted.
Non-Compliant	☐	

Power Frequency Magnetic Field Immunity Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
811	Multimeter	Fluke	111	78130057	20-Feb-2013	20-Feb-2014
604	AC Power System	California Instruments	OMNI-3-18 with 5001i	--	26-Feb-2013	26-Feb-2014
E1036	Large Magnetic Coil	Nemko	N/A	N/A	N/R	N/R
Rental	Magnetic Field Sensor	Narda	ETL-400	K-0033	23-Feb.2013	23-Feb.2014

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	38 of 49

Photograph 4. Conducted Emissions Test Configuration



DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	39 of 49

Nemko USA, Inc.

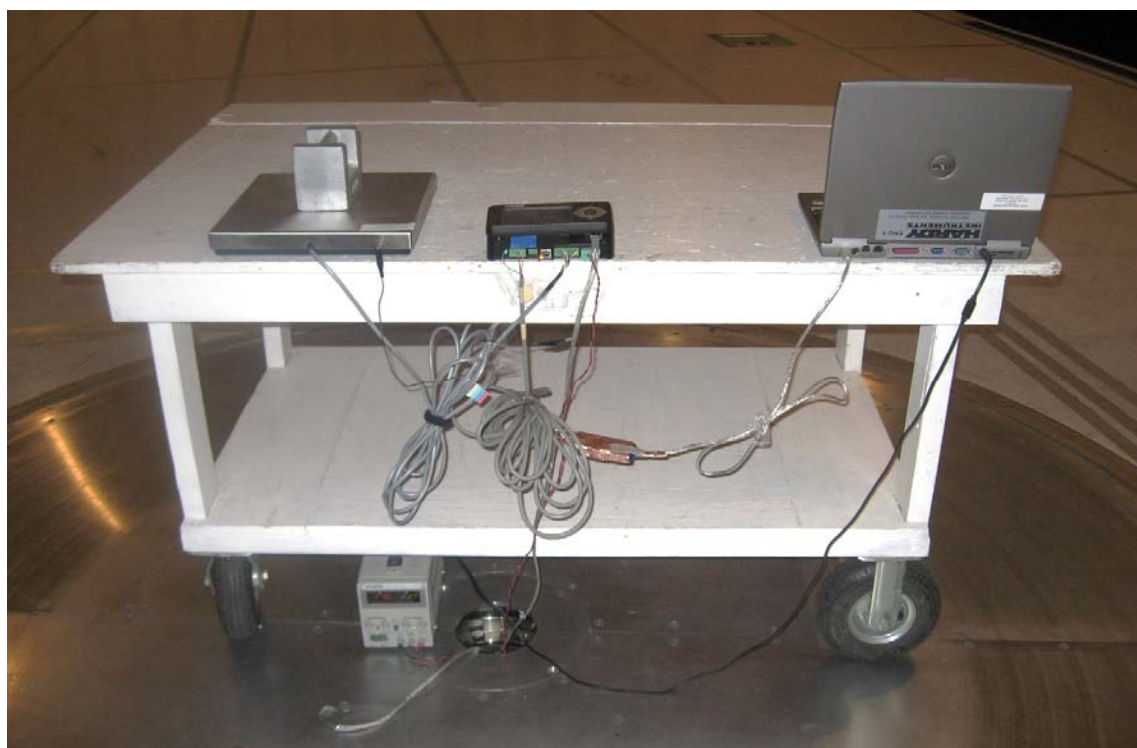
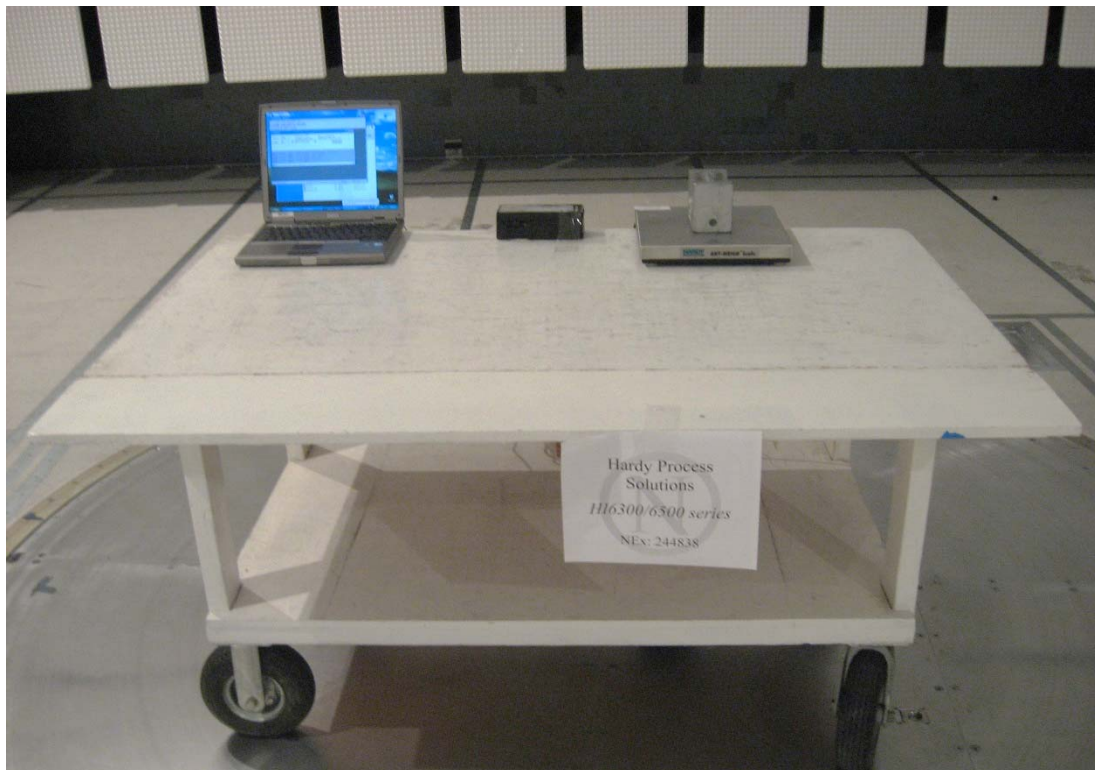
2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005



Photograph 5. Radiated Emissions Test Configuration



DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	40 of 49

Nemko USA, Inc.

2210 Faraday Ave, Suite 150

Carlsbad, CA 92008

Phone (760) 444-3500 Fax (760) 444-3005

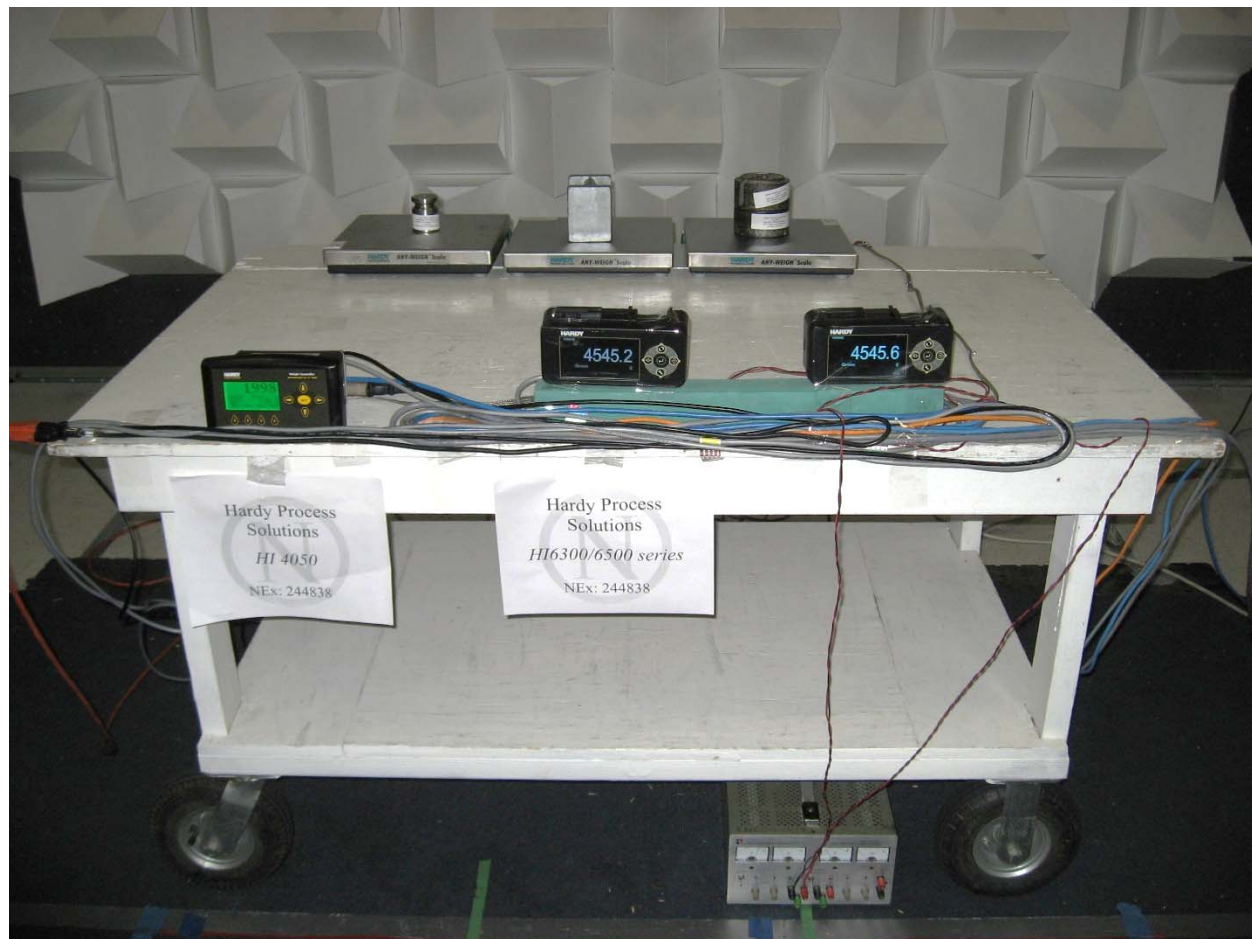


Photograph 6. ESD Test Configuration

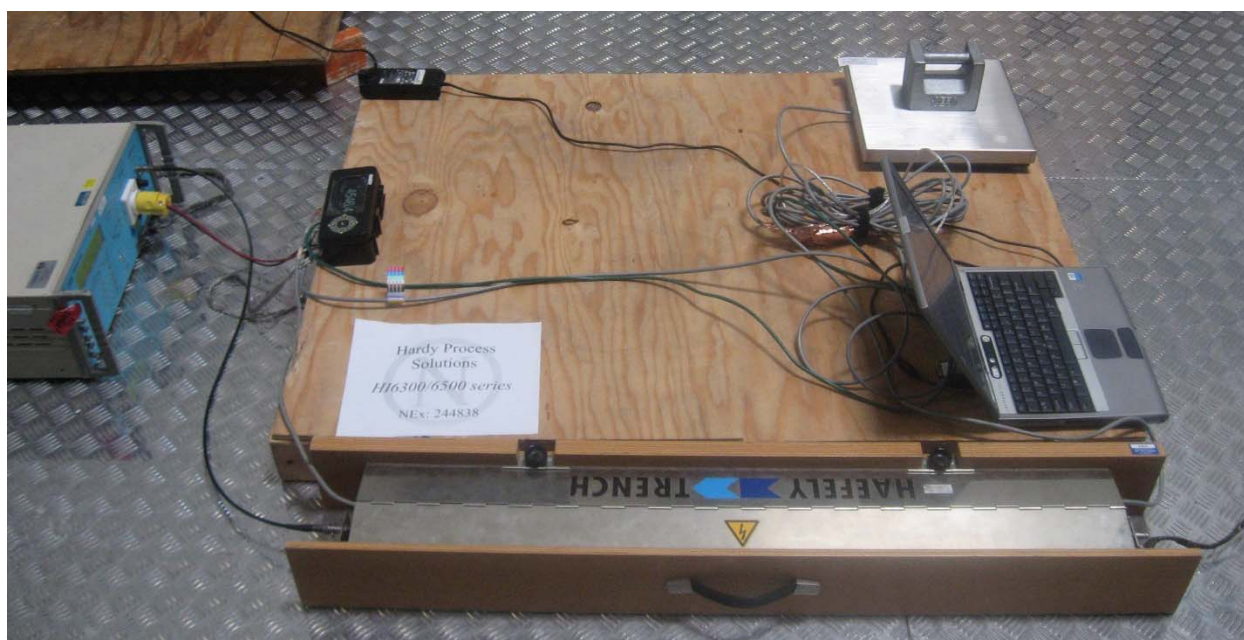
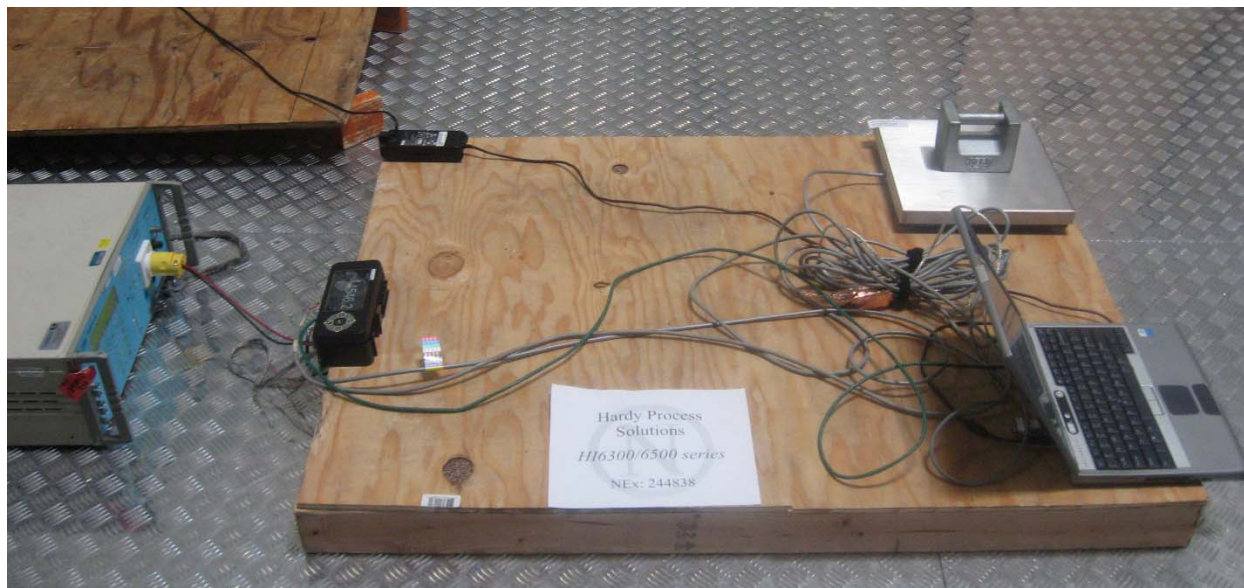


DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	41 of 49

Photograph 7. Radio Frequency Immunity Test Configuration

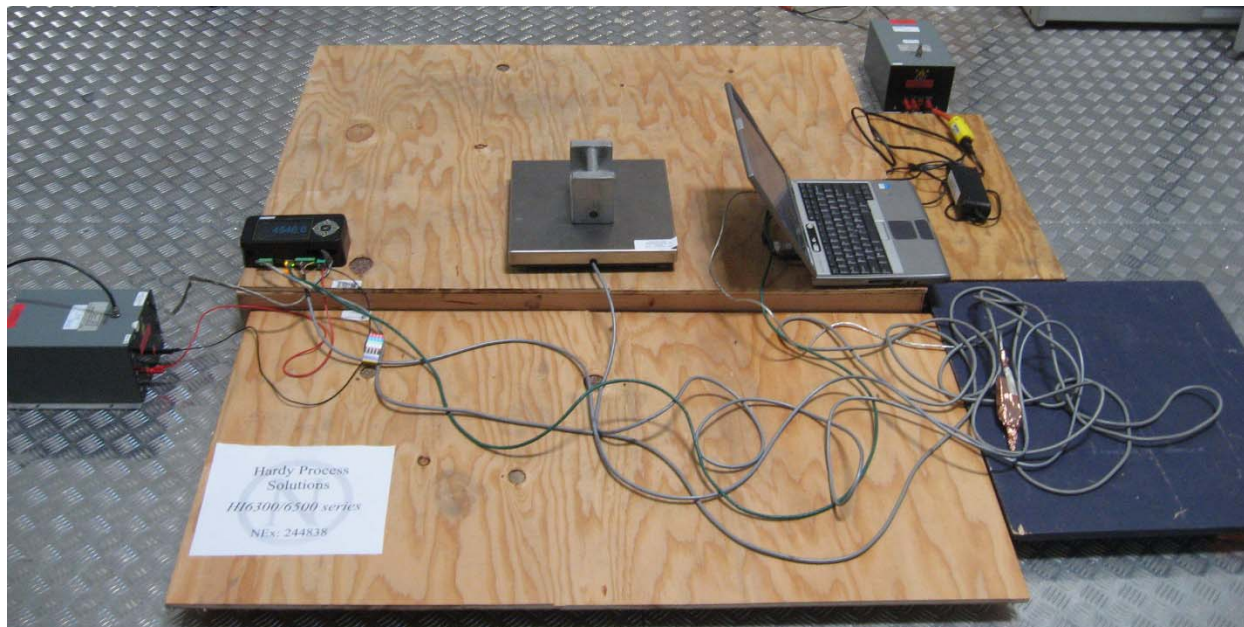


Photograph 8. EFT Immunity Test Configuration



DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	43 of 49

Photograph 9. RF Conducted Immunity Test Configuration



DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	44 of 49

Photograph 10. Power Frequency Magnetic Field Immunity Test Configuration



DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	45 of 49

APPENDIX A

A. Radiated Emissions Measurement Uncertainties

1. Introduction

ISO/IEC 17025:2005 and ANSI/NCSL Z540.3: 2006 require that all measurements contained in a test report be “traceable”. “Traceability” is defined in the International Vocabulary of Basic and General Terms in Metrology (ISO: 1993) as: “the property of the result of a measurement... whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons, all having stated uncertainties”.

The purposes of this Appendix are to “state the Measurement Uncertainties” of the conducted emissions and radiated emissions measurements contained in Section 5 of this Test Report, and to provide a practical explanation of the meaning of these measurement uncertainties.

2. Statement of the Worst-Case Measurement Uncertainties for the Conducted and Radiated Emissions Measurements Contained in This Test Report

Table 1: Worst-Case Expanded Uncertainty "U" of Measurement for a k=2 Coverage Factor

Worst-Case Expanded Uncertainty "U" of Measurement for a k=2 Coverage Factor		
Spectrum Analyzer and LISN	100 kHz – 30 MHz	+/-2.8 dB
Spectrum Analyzer and Telecom ISN	100 kHz – 30 MHz	+/-1.38dB
Spectrum Analyzer and Absorbing clamp	30 MHz-1000 MHz	+/- 3.1 dB
Spectrum Analyzer, Pre-amp, and Antenna	30 MHz-200 MHz	+/-3.9 dB
Spectrum Analyzer, Pre-amp, and Antenna	200 MHz-1000 MHz	+/- 3.5 dB
Spectrum Analyzer, Pre-amp, and Antenna	1 GHz - 18 GHz	+/-2.6 dB

NOTES:

1. Applies to 3 and 10 meter measurement distances
2. Applies to all valid combinations of Transducers (i.e. LISNs, Line Voltage Probes, and Antennas, as appropriate)
3. Excludes the Repeatability of the EUT

3. Practical Explanation of the Meaning of Radiated Emissions Measurement Uncertainties

In general, a “Statement of Measurement Uncertainty” means that with a certain (specified) confidence level, the “true” value of a measurand will be between a (stated) upper bound and a (stated) lower bound.

In the specific case of EMC Measurements in this test report, the measurement uncertainties of the conducted emissions measurements and the radiated emissions measurements have been calculated in accordance with the method detailed in the following documents:

- o ANSI Z540.2 (2002) Guide to the Expression of Uncertainty in Measurement
- o NIS 81:1994, The Treatment of Uncertainty in EMC Measurements (NAMAS, 1994)
- o NIST Technical Note 1297(1994), Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (NIST, 1994)

The calculation method used in these documents requires that the stated uncertainty of the measurements be expressed as an “expanded uncertainty”, U , with a $k=2$ coverage factor. The practical interpretation of this method of expressing measurement uncertainty is shown in the following example:

EXAMPLE: Assume that at 39.51 MHz, the (measured) radiated emissions level was equal to +26.5 dBuV/m, and that the ± 2 standard deviations (i.e. 95% confidence level) measurement uncertainty was ± 3.4 dB.



APPENDIX B

B. Nemko USA, Inc. Test Equipment & Facilities Calibration Program

Nemko USA, Inc. operates a comprehensive Periodic Calibration Program in order to ensure the validity of all test data. Nemko USA's Periodic Calibration Program is fully compliant to the requirements of NVLAP Policy Guide PG-1-1988, ANSI/NCSL Z540.3: 2006, ISO 10012:2003, ISO/IEC 17025:2005, and ISO-9000: 2000. Nemko USA, Inc.'s calibrations program therefore meets or exceeds the US national commercial and military requirements [N.B. ANSI/NCSL Z540-1-1994 replaced MIL-STD-45662A].

Specifically, all of Nemko USA's primary reference standard devices (e.g. vector voltmeters, multimeters, attenuators and terminations, RF power meters and their detector heads, oscilloscope mainframes and plug-ins, spectrum analyzers, RF preselectors, quasi-peak adapters, interference analyzers, impulse generators, signal generators and pulse/function generators, field-strength meters and their detector heads, etc.) and certain secondary standard devices (e.g. RF Preamplifiers used in CISPR 11/22 and FCC Part 15/18 tests) are periodically recalibrated by:

- o A Nemko USA-approved independent (third party) metrology laboratory that uses NIST-traceable standards and that is ISO Guide 25-accredited as a calibration laboratories by NIST; or,
- o A Nemko USA-approved independent (third party) metrology laboratory that uses NIST-traceable standards and that is ISO Guide 25-accredited as a calibration laboratory by another accreditation body (such as A2LA) that is mutually recognized by NIST; or,
- o A manufacturer of Measurement and Test Equipment (M&TE), if the manufacturer uses NIST-traceable standards and is ISO Guide 25-accredited as calibration laboratory either by NIST or by another accreditation body (such as A2LA) that is mutually recognized by NIST; or
- o A manufacturer of M&TE (or by a Nemko USA-approved independent third party metrology laboratory) that is not ISO Guide 25-accredited. (In these cases, Nemko USA conducts an annual audit of the manufacturer or metrology laboratory for the purposes of proving traceability to NIST, ensuring that adequate and repeatable calibration procedures are being applied, and verifying conformity with the other requirements of ISO Guide 25).

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	48 of 49

Nemko USA, Inc.

2210 Faraday Ave, Suite 150
Carlsbad, CA 92008
Phone (760) 444-3500 Fax (760) 444-3005



In all cases, the entity performing the Calibration is required to furnish Nemko USA with a calibration test report and/or certificate of calibration, and a “calibration sticker” on each item of M&TE that is successfully calibrated.

Calibration intervals are normally one year, except when the manufacture advises a shorter interval or if US Government directives or client requirements demand a shorter interval. Items of instrumentation/related equipment which fail during routine use, or which suffer visible mechanical damage (during use or while in transit), are sidelined pending repair and recalibration. (Repairs are carried out either in-house [if minor] or by a Nemko USA-approved independent [third party] metrology laboratory, or by the manufacturer of the item of M&TE).

Each antenna used for CISPR 11, CISPR 14, CISPR 22, and FCC Part 15 and Part 18 radiated emissions testing (and for testing to the equivalent European Norms) is calibrated annually by either a NIST (or A2LA) ISO Standard 17025-Accredited third-party Antenna Calibration Laboratory or by the antenna’s OEM if the OEM is NIST or A2LA ISO Standard 17025-accredited as an antenna calibration laboratory. The antenna calibrations are performed using the methods specified in CISPR 16-1-4 or ANSI C63.5-2006, including the “Three-Antenna Method”. Certain other kinds of antennas (e.g. magnetic-shielded loop antennas) are calibrated annually by either a NIST (or A2LA) ISO Standard 17025-accredited third-party antenna calibration laboratory, or by the antenna’s OEM if the OEM is NIST or A2LA ISO Standard 17025-accredited as an antenna calibration laboratory using the procedures specified in the latest version of SAE ARP-958.

In accordance with FCC and other regulations, Nemko USA recalibrates its suite of antennas used for radiated emissions tests on an annual basis. These calibrations are performed as a precursor to the FCC-required annual revalidation of the Normalized Site Attenuation properties of Nemko USA’s 10-meter Semi-Anechoic chamber. Nemko USA, Inc. uses the procedures given in CISPR 16-1-4 and, ANSI C63.4-2009 when performing the normalized site attenuation measurements.

DATE	DOCUMENT NAME	DOCUMENT #	PAGE
October 11, 2013	Hardy Process Solutions - HI6510-WP-10-EIP - EMC Test Report	2013 10244838 EMC	49 of 49