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

EMC IMMUNITY SUMMARY TEST REPORT

For The Hardy Load Cell Summing Box

Model: HI 60xx Series

Prepared for:
Hardy Process Solutions
9440 Carroll Park Drive Suite 150
San Diego, CA 92121

EMC Directive 2004/108/EC

CE

Testing performed per the following:

IEC/EN 61326-1
Electrical equipment for measurement, control and laboratory use

IEC/EN 61000-6-2
Immunity for industrial environment

PREPARED on 8/13/2014
REPORT NUMBER: 2014 08264569 EMC
PROJECT NUMBER: Q10264499
NEX NUMBER: 264569

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1 Contents

APPENDICES

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2 Document History and Certification

2.1 Document History

REVISION	DATE	COMMENTS
-	8/7/2014	Prepared By: Jose A. Cuevas
-	8/7/2014	Initial Release: Mike Krumweide

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":

- The unit described in this report was received at Nemko USA, Inc.'s facilities on 7/10/2014.
- Testing was performed on the unit described in this report on 7/10/2014 to 7/29/2014.
- The Test Results reported herein apply only to the Unit actually tested, and to substantially identical Units.
- This report does not imply the endorsement of the Federal Communications Commission (FCC), NVLAP or any other government agency.

2.2 Test Site 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.

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2.3 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.

Michael T. Krumweide
EMC Supervisor/Report Verification

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3 Administrative Data and Test Summary

3.1 Administrative Test Data

CLIENT:	Hardy Process Solutions 9440 Carroll Park Drive Suite 150 San Diego, CA 92121 858-255-6814
CONTACT:	Lito Guiriba Lito.Guiriba@hardysolutions.com
DATE(S) OF TEST:	7/10/2014 to 7/29/2014
EQUIPMENT UNDER TEST (EUT):	Hardy Load Cell Summing Box
MODEL:	HI 60xx Series including: HI6010JB, HI6011JB, HI6020JB, HI6010IT, HI6011IT and HI6020IT. HI6010IT-PC1 and HI6020IT-PS1 were selected as the worst case representative of all models.

Product Series Configuration:

HI6xxxxx – xxx
I II

Suffix x may be any alphanumeric character representing the following nomenclature:

I: Series Designations

HI6010JB, HI6011JB, HI6020JB = JB Summing Box
HI6010IT, HI6011IT, HI6020IT = IT Summing Box

II: Load Cell Summing Card Options

-SC1 = Summing Card Only
-SC2 = Summing Card w/ Trim Pots
-PC1 = Summing Card in Polymer Enclosure
-PC2 = Summing Card in Polymer Enclosure w/ Trim Pots
-FG1 = Summing Card in Fiberglass Enclosure
-FG2 = Summing Card in Fiberglass Enclosure, with Trim Pots
-PS1 = Summing Card in Painted Steel Enclosure
-PS2 = Summing Card in Painted Steel Enclosure, with Trim Pots
-SS1 = Summing Card in Stainless Steel Enclosure
-SS2 = Summing Card in Stainless Steel Enclosure, with Trim Pots

SERIAL NUMBER:	1162 and 1008
SOFTWARE REVISION:	N/A
HIGHEST FREQUENCY GENERATED OR USED:	100 KHz
CONDITION UPON RECEIPT:	Acceptable

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TEST SPECIFICATION: Electromagnetic Immunity tests in accordance with requirements of EN 61326-1: 2013 and EN 61000-6-2: 2005

Specified tests required:

IEC/EN 61000-6-2	Immunity Tests (use higher level where appropriate):
IEC 61000-4-2	Electrostatic Discharge (±8 kV Air/±4kV Contact Discharge)
IEC 61000-4-3	RF Radiated Fields (3-10 V/m, 80MHz-2.7GHz, 80% AM @ 1kHz)
IEC 61000-4-4	Electrical Fast Transients (±1.0kV I/O lines >3m)
IEC 61000-4-6	RF Common Mode (signal line only: 150kHz-80MHz, 3-10Vrms, 80% AM 1kHz)
IEC 61000-4-8	Power Frequency Magnetic Field Immunity (50 or 60Hz, if applicable)

3.2 Referenced Standards for Immunity Tests

Test Type	In Accordance with Document	Document Title
Electrostatic Discharge	EN 61000-4-2: 2009	Electromagnetic Compatibility—Testing and measurement techniques - Electrostatic discharge immunity test
Radio Frequency	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	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	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	IEC 61000-4-11: 2004	Electromagnetic Compatibility—Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests

3.3 Device Performance Criteria for Immunity Tests

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.

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.

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.

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3.4 Immunity Test Summary

Test Methods	Minimum Criterion Level Required as per EN 61326-1 for an Industrial electromagnetic environment	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 to 1000 MHz 3 V/m from 1.4 to 2 GHz 1 V/m from 2 to 2.7 GHz (80% AM at 1kHz)	**Criterion A** 10 V/m from 80 to 1000 MHz 10 V/m from 1.4 to 2 GHz 3 V/m from 2 to 2.7 GHz (80% AM at 1kHz)	**PASS**
EN 61000-4-4: 2004+A1: 2010 -Electrical Fast Transient Immunity	**Criterion B** I/O line pulses of ± 1kV	**Criterion B** I/O line pulses of ± 1kV	**PASS**
EN 61000-4-5: 2006 -Surge Immunity	**Criterion B** ±2kV common mode, ±1kV differential mode	**Criterion A** ±2kV common mode, ±1kV differential mode	**N/A ***
EN 61000-4-6: 2009 -RF Common Mode Immunity	**Criterion A** 150 kHz - 80 MHz at 3 Vrms 1 kHz 80% amplitude modulated	**Criterion A** 150 kHz - 80 MHz at 3 and 10Vrms 1kHz 80% amplitude modulated	**PASS**
EN 61000-4-8: 2010 Power Frequency Magnetic Field	**Criterion A** Inductive loop at 50 Hz, 60Hz, to 30 amps (rms) per meter	**Criterion A** Inductive loop at 50Hz, 60Hz to 30 amps (rms) per meter	**PASS**
EN 61000-4-11: 2004 - Voltage Dips and Short Interruptions	**Criterion B and C** 0% Voltage for 1 cycle-B 40% Voltage for 10 cycles-C 70% Voltage for 25 cycles-C 0% Voltage for 250 cycles-C	**Criterion A and C** 0% Voltage for 1 cycle-B 40% Voltage for 10 cycles-C 70% Voltage for 25 cycles-C 0% Voltage for 250 cycles-C	**N/A ***

* EUT is DC powered.
Refer to the test results section for further details.

4 SYSTEM CONFIGURATION

4.1 System Components and Power Cables

Device	Manufacturer	Cable
	Model	Type
	SN	Length
Hardy Load Cell Summing Box	Hardy Process Solutions	Hardy C2 Cable
	HI6010IT-PC1	Hardy Instruments C2 Certified cable P/N 6020-0001-0
	1162	4m
Hardy Load Cell Summing Box	Hardy Process Solutions	Hardy C2 Cable
	HI6020IT-PS1	Hardy Instruments C2 Certified cable P/N 6020-0001-0
	1008	4m
Weight Processor (support)	Hardy Process Solutions	DC Power Cable
	HI6510-WP-10-PB	24 AWG 2-wire
	1095	.3m
Weight Processor (support)	Hardy Process Solutions	DC Power Cable
	HI6500-WP-10-EIP	24 AWG 2-wire
	8	.3m
Load Cells (support)	Hardy Process Solutions	N/A
	HI BBH06-44	N/A
	N/A	N/A
Power Supply Unit (support)	Allen Dradley	AC Power Cable , unshielded 3 wire
	1606-XLS240E	18 AWG, IEC c-19 connector
	N/A	1.5m

4.2 Device Interconnection and I/O Cables

FROM DEVICE	TO DEVICE	CABLE TYPE / LENGTH
Summing Box HI6010IT	**Load Cell**	**4 Load cell Cable, Shielded 2m**
Summing Box HI6020IT	**Load Cell**	**4 Load cell Cable, Shielded 2m**
Summing Box HI6010IT	**Weight Processor**	**Hardy C2 cable, 4m**
Summing Box HI6020IT	**Weight Processor**	**Hardy C2 cable, 4m**

4.3 Description and Method of Exercising the EUT

The Hardy Load Cell Summing Box is a critical component in a weighing system that enables use of Hardy's core technologies - C2®, eCAL™, and IT. The summing box distributes excitation voltage to up to four load cells and transfers each load cell's performance characteristics and weight signals to the Hardy weight controller. A summing card with IT (Integrated Technician®) inside the summing box allows a weighing instrument operator to switch to the summing card's internal test circuit and diagnose the entire weighing system from the front panel of the instrument or a remote location over the Internet. Individual load cells can be isolated from each other for weight and voltage readings, allowing a technician or operator to quickly and safely troubleshoot weighing system faults and anomalies. The Hardy summing box is available with a variety of options (e.g. with or without IT or trim pots for non-Hardy load cells) and ships in a UL Type 4/4X enclosure. Each box comes with packaged hole plugs and cable grip fittings suitable for load cell cables with an outside diameter of 6 to 12mm. Mode(s) of Operation: The EUT will provide an analog signal proportional to sum of the load placed onto one to four load cells, or be directly proportional to the value from a load cell simulator. The analog signal should provide a value to a Weight Processor. The fail mode for the EUT is when there is weight change of more than 8 grams peak to peak on an 80,000 gram scale (1:10000).

4.4 Design Modifications for Compliance

Device: Hardy Load Cell Summing Box
Model: HI 60xx Series

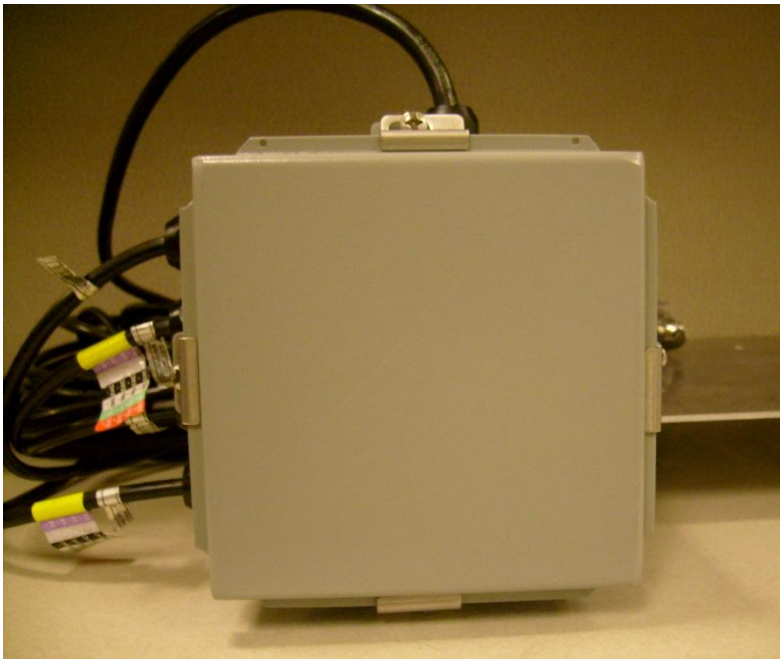
HI6020IT Design modification for compliance to IEC 61000-4-3 and IEC 61000-4-6:
• 0.01uF bypass capacitors are installed between +EXC and –EXC in the load points connectors and instruments connector in the JBox PWA.
• SHIELD in the PWA is connected to the JBox and onto the Earth ground.
• Ferrites are installed on the C2 cable and load cells cables at the JBox (outside).

Ferrites installed on the C2 Cable:
WURTH ELEKTRONIK P/N 742 712 22
WURTH ELEKTRONIK P/N 742 712 22
WURTH ELEKTRONIK P/N 742 712 22S
WURTH ELEKTRONIK P/N 742 717 22

Ferrites installed on the load cells Cables:
Load cell 1: WURTH ELEKTRONIK P/N 742 712 21 and 742 717 22
Load cell 2: WURTH ELEKTRONIK P/N 742 712 21 and 742 717 22
Load cell 3: WURTH ELEKTRONIK P/N 742 712 21S and 742 717 22
Load cell 4: WURTH ELEKTRONIK P/N 742 712 22S and 742 717 22

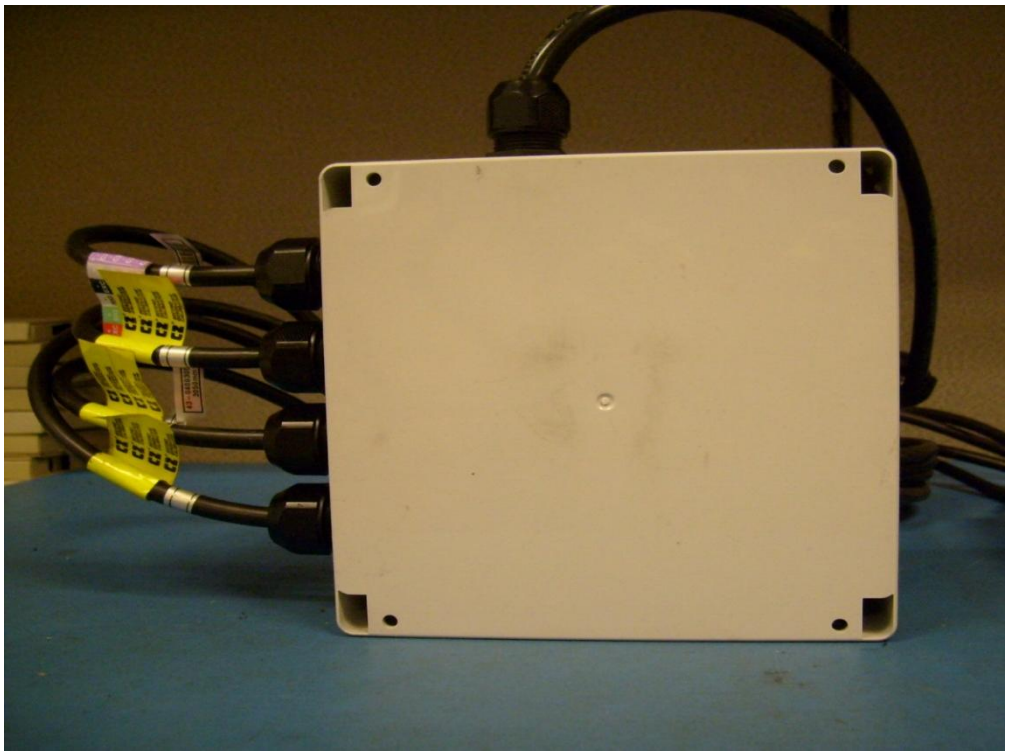
4.4.1 Front of EUT

HI6010IT-PC1 Front

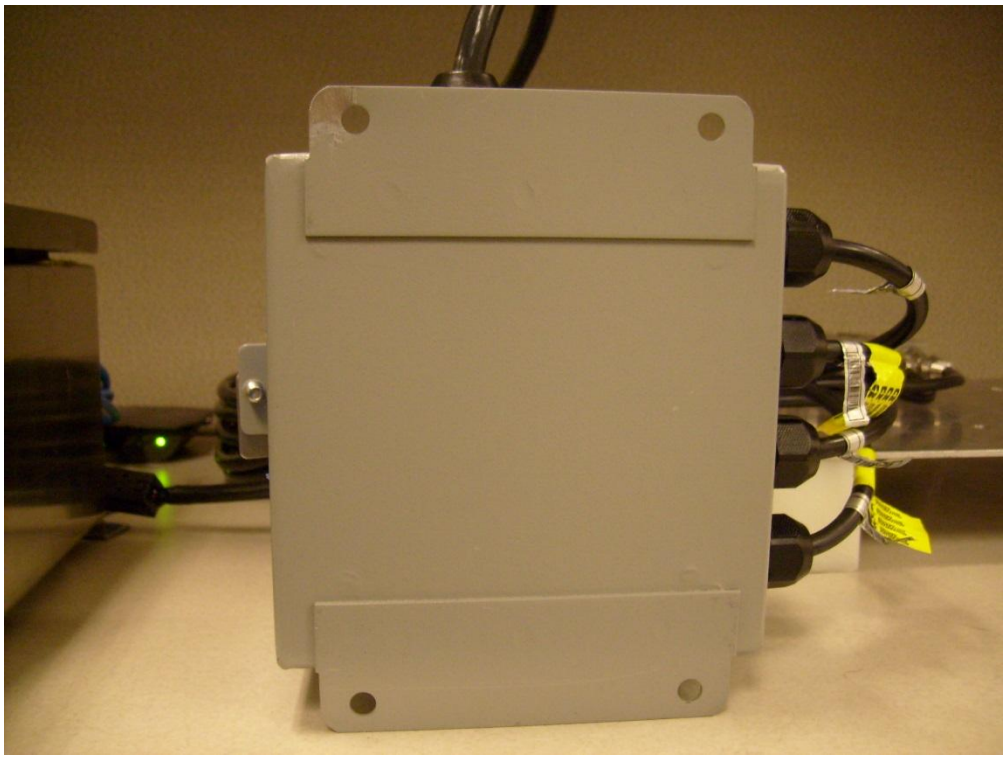


HI6020IT-PS1 Front

4.4.2 Rear of EUT

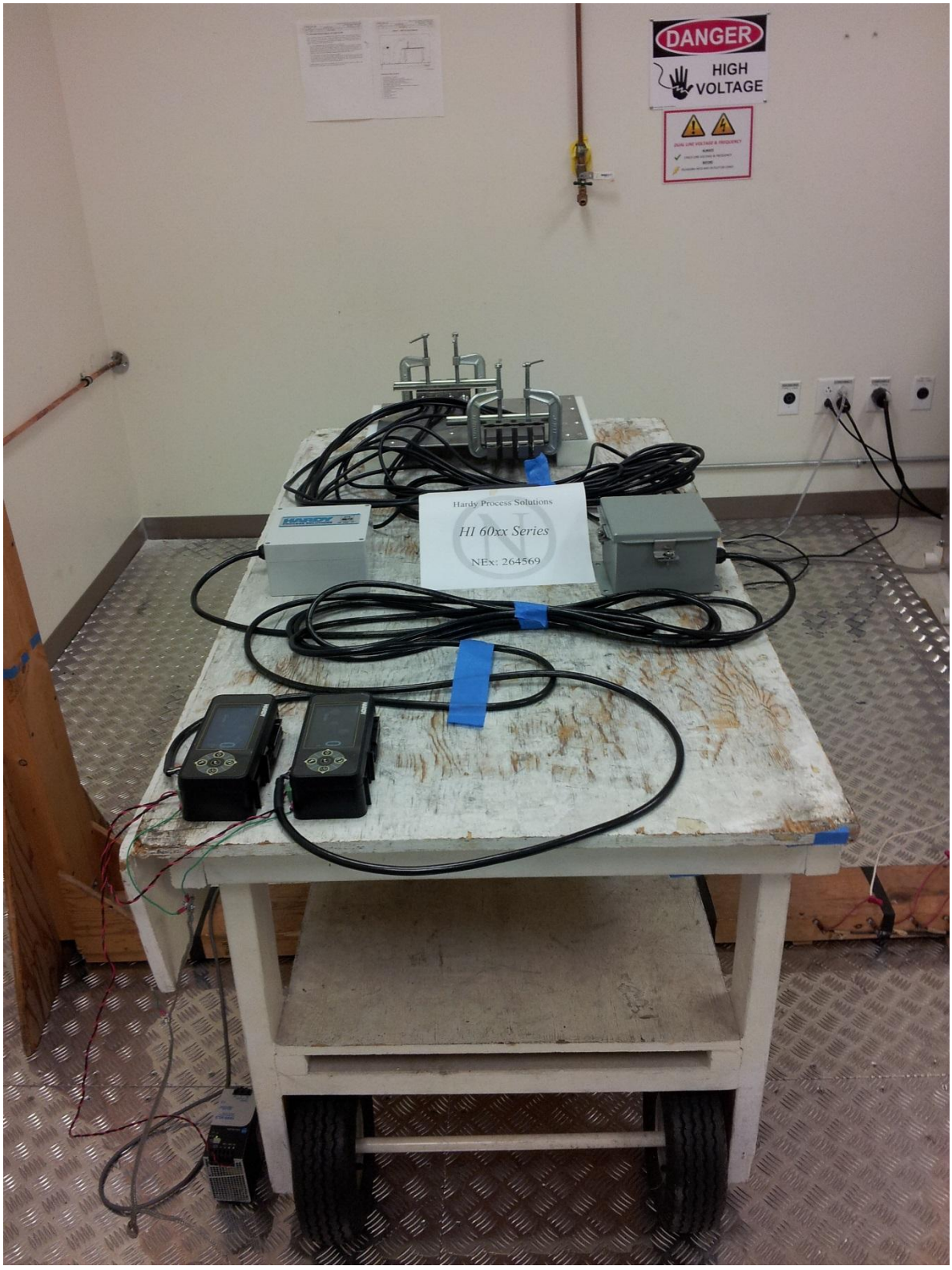


HI6010IT-PC1 Rear



HI6020IT-PS1 Rear

4.4.3 Configuration of the EUT



5 Description of Test Site

5.1 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.

5.2 Test Site Registrations

Organization	Registration and Recognition numbers
Federal Communications Commission	392943 / US5058
Industry Canada	2040B-3
VCCI	A-0184
Korean Ministry (APEC Tel MRA)	US0088

This report does not imply the endorsement of the recognizing organizations or any other government agency.

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5.3 Equipment List

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
-2, Electrostatic Discharge						
818	ESD Gun	Schaffner	NSG-435	5111	12/16/2013	12/16/2014
E1044	Temp Humidity Meter	Davis Instruments	7400	PE80513A01	1/9/2014	1/9/2015
-3, Radio Frequency						
932	Signal Generator	Hewlett-Packard	8673C	2822A00556	9/6/2013	9/6/2014
751	Signal Generator	HP	8642B	3034A03286	9/9/2013	9/9/2014
740	RF Amplifier	Amplifier Research	500W1000M5 (80 to 1000MHz)	23680	NCR	NCR
743	RF Amplifier	Amplifier Research	200T1G3M3 (800 to 2800MHz)	19649	NCR	NCR
D1818	Antenna, Biconical, high power	TDK RF Solutions	HBA-2030	130496	NCR	NCR
728	Microwave Horn Antenna	Amplifier Research	AT4002A (0.8 to 5 GHz)	23811	NCR	NCR
372	Antenna, Dual Ridge	Electro-Metrics	RGA 25	2225	11/5/2012	11/5/2014
-4, Electrical Fast/Burst						
416	PEFT Jr.	Haefley-Trench	PEFT Jr.	083 180-40	7/3/2013	8/3/2014
E1015	Capacitive Coupling Clamp	0	093 506.1	083 874 -08	NCR	NCR
-6, RF Conducted Disturbance						
948	0.1 to 1040 MHz Signal Generator	Hewlett Packard	8657A	3430U02365	2/27/2014	2/27/2015
913	RF Amplifier	EIN	3100L	103	NCR	NCR
472	CDN	FCC	FCC-801-M2-25	24	7/17/2013	8/17/2014
436	Current Injection Probe	Solar Electronics Co.	9144 1N (10kHz to 100MHz)	935717	NCR	NCR
-8, Power Frequency; Magnetic						
851	Exposure Level Tester	Narda	ELT-400	F-0011	1/31/2014	1/31/2015
962	AC Power Source	Teseq	NSG 1007-5-208	58962	4/28/2014	4/28/2015
E1016	100 Watt Solid State Audio Amplifier	Solar	6552-1A	082604	NCR	NCR

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6 Test Results

6.1 -2, Electrostatic Discharge

This test simulates electrostatic events and evaluates the ability of the EUT to tolerate such events. Testing was performed in accordance with IEC 61000-4-2. All accessible enclosure surfaces and ports are evaluated unless specified as a static sensitive surface. The product specific standard sets the level and the number of test strikes to apply.

6.1.1 Electrostatic Discharge Immunity

Client	Hardy Process Solutions			
NEx #	264569	Temperature	23	˚C
EUT Name	Hardy Load Cell Summing Box	Humidity	55	%
EUT Model	HI 60xx Series	Pressure	100.4	kPa
Governing Doc	IEC/EN 61326-1 & IEC/EN 61000-6-2	Test Location	ESD Plane	
Basic Standard	IEC 61000-4-2	Test Engineer	Jose A. Cuevas	
Test Voltage	5VDC	Date	7/11/2014	

Test Conditions	
Discharge Rep. Rate	> 1 per second
Number of Discharges	> 10 per location
Performance Criteria:	B
EUT Mode:	**Powered up and measuring weight**

Contact Discharge						
Voltage: (+/- kV)	2 ☒	4 ☒	5 ☐	6 ☐	Other ☐	

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 ☒	15 ☐	Other ☐	

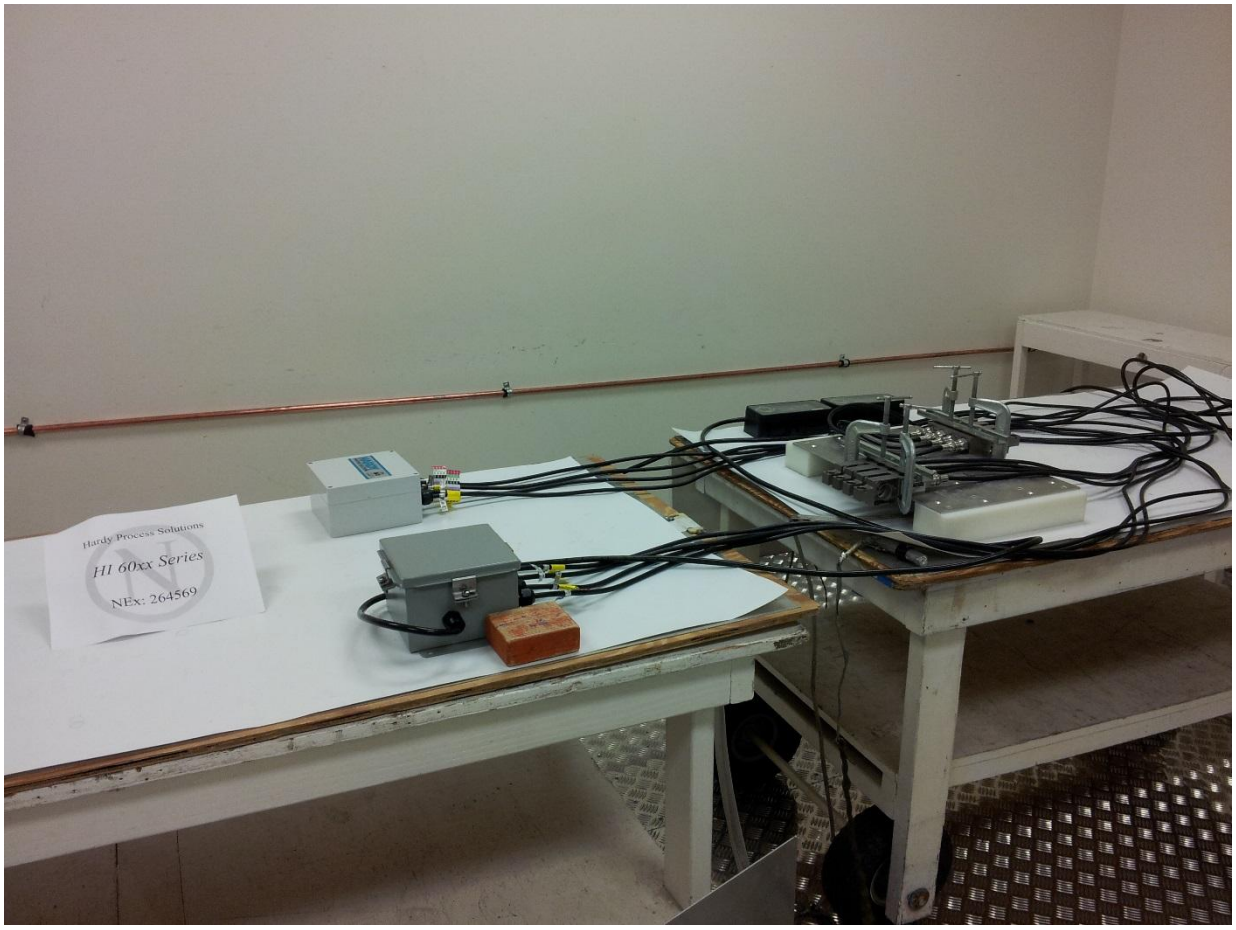
Location	Comments
Air Locations	No susceptibility noted.
"Spark" event(s)	No Spark events noted. No susceptibility noted.

Compliancy			
Compliant?	Yes	Additional Comments	

6.1.2 List of Equipment

818, ESD Gun; E1044, Temp Humidity Meter.

6.1.3 Reference Photos



ESD test Setup

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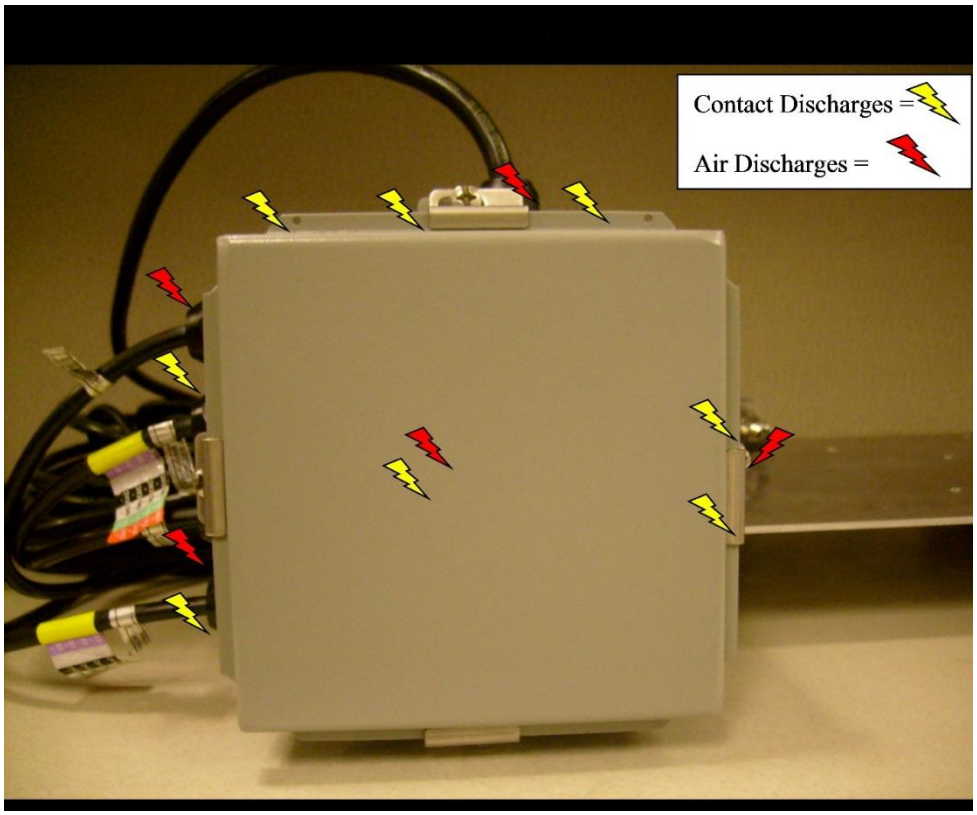

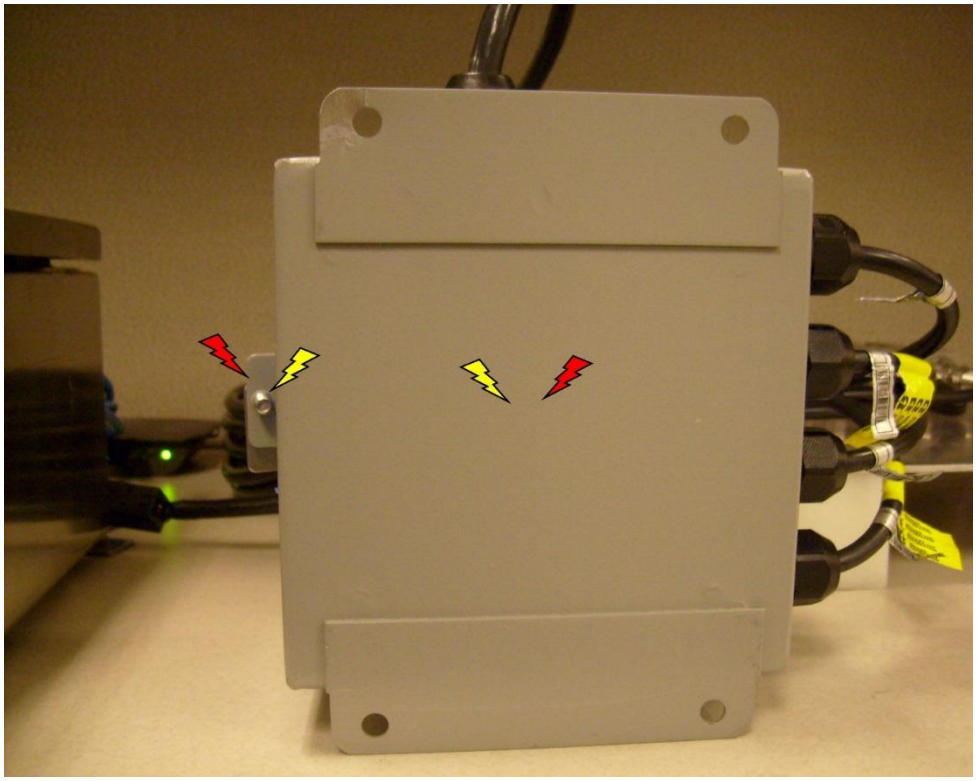

ESD test points

6.2 -3, Radio Frequency

The radiated RF immunity test exposes the equipment under test to a calibrated uniform field of radiated electromagnetic energy. The EUT is continuously monitored while exposed to the required frequency range and field strength. The test chamber, radiating antennas, and calibrated fields meet the requirements of referenced standards. The product specific standard sets the level, duration, and the frequency range to apply.

6.2.1 HI6010IT-PC1

6010IT in the RFI chamber. Load Cells on the floor, 1m behind the EUT covered with a cardboard box and absorbing material. Weight processors outside the chamber.

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Client	Hardy Process Solutions			
NEx #	264569	Temperature	23	˚C
EUT Name	Hardy Load Cell Summing Box	Humidity	55	%
EUT Model	HI 60xx Series	Pressure	100.4	kPa
Governing Doc	IEC/EN 61326-1 & IEC/EN 61000-6-2	Test Location	RF Imm Chamber	
Basic Standard	IEC 61000-4-3	Test Engineer	Jose A. Cuevas	
Test Voltage	5VDC	Date	7/11/2014	

Test Conditions	
Test Level	10V/m and 3V/m
Frequency Swept	80-2700MHz
Selected Frequencies	None
Modulation	1kHz, 80% AM
Frequency Step	1%
Dwell Time	2-3 seconds
Performance Criteria	A
EUT Mode	**Powered up and measuring weight**

Test Scans Accomplished				
Frequency (MHz)	Antenna Polarization	Compliant	Orientation	Comments
80-200MHz	V, H	Yes	Front	10V/m
80-200MHz	V, H	No	Side Left	10V/m.
80-200MHz	V, H	Yes	Side Right	10V/m
80-200MHz	V, H	No	Rear	10V/m.
200MHz-1GHz	V, H	Yes	Front	10V/m
200MHz-1GHz	V, H	Yes	Side Left	10V/m
200MHz-1GHz	V, H	Yes	Side Right	10V/m
200MHz-1GHz	V, H	Yes	Rear	10V/m
1GHz-2GHz	V, H	Yes	Front	10V/m
1GHz-2GHz	V, H	Yes	Side Left	10V/m
1GHz-2GHz	V, H	Yes	Side Right	10V/m
1GHz-2GHz	V, H	Yes	Rear	10V/m
2GHz-2.7GHz	V, H	Yes	Front	3V/m
2GHz-2.7GHz	V, H	Yes	Side Left	3V/m
2GHz-2.7GHz	V, H	Yes	Side Right	3V/m
2GHz-2.7GHz	V, H	Yes	Rear	3V/m

Compliancy			
Compliant?	Yes	Additional Comments	

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6.2.2 HI6020IT-PS1

6020IT in the RFI chamber. Load Cells on the floor, 1m behind the EUT covered with a cardboard box and absorbing material. Weight processors outside the chamber.

Client	Hardy Process Solutions			
NEx #	264569	Temperature	23	˚C
EUT Name	Hardy Load Cell Summing Box	Humidity	55	%
EUT Model	HI 60xx Series	Pressure	100.4	kPa
Governing Doc	IEC/EN 61326-1 & IEC/EN 61000-6-2	Test Location	RF Imm Chamber	
Basic Standard	IEC 61000-4-3	Test Engineer	Jose A. Cuevas	
Test Voltage	5VDC	Date	7/29/2014	

Test Conditions	
Test Level	10V/m and 3V/m
Frequency Swept	80-2700MHz
Selected Frequencies	None
Modulation	1kHz, 80% AM
Frequency Step	1%
Dwell Time	2-3 seconds
Performance Criteria	A
EUT Mode	**Powered up and measuring weight**

Test Scans Accomplished				
Frequency (MHz)	Antenna Polarization	Compliant	Orientation	Comments
80-200MHz	V, H	Yes	Front	10V/m
80-200MHz	V, H	No	Side Left	10V/m.
80-200MHz	V, H	Yes	Side Right	10V/m
80-200MHz	V, H	No	Rear	10V/m.
200MHz-1GHz	V, H	Yes	Front	10V/m
200MHz-1GHz	V, H	Yes	Side Left	10V/m
200MHz-1GHz	V, H	Yes	Side Right	10V/m
200MHz-1GHz	V, H	Yes	Rear	10V/m
1GHz-2GHz	V, H	Yes	Front	10V/m
1GHz-2GHz	V, H	Yes	Side Left	10V/m
1GHz-2GHz	V, H	Yes	Side Right	10V/m
1GHz-2GHz	V, H	Yes	Rear	10V/m
2GHz-2.7GHz	V, H	Yes	Front	3V/m
2GHz-2.7GHz	V, H	Yes	Side Left	3V/m
2GHz-2.7GHz	V, H	Yes	Side Right	3V/m
2GHz-2.7GHz	V, H	Yes	Rear	3V/m

Compliancy			
Compliant?	Yes	Additional Comments	Complies after modifications.

6.2.3 List of Equipment

932, Signal Generator ; 751, Signal Generator; 740, RF Amplifier; 743, RF Amplifier; D1818, Antenna, Biconical, high power; 728, Microwave Horn Antenna; 372, Antenna, Dual Ridge.

6.2.4 Reference Photos

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6.3 -4, Electrical Fast/Burst

This test injects a transient/burst interference onto the Mains input power supply and signal I/O lines. The EUT and peripherals were placed on a non-conductive support platform, 10cm above the test ground plane. The EUT was monitored for disturbances during required exposure time of positive and negative bursts. The product specific standard sets the level and exposure time to apply.

6.3.1 HI6010IT-PC1

Client	Hardy Process Solutions			
NEx #	264569	Temperature	23	˚C
EUT Name	Hardy Load Cell Summing Box	Humidity	55	%
EUT Model	HI6010IT	Pressure	100.4	kPa
Governing Doc	IEC/EN 61326-1 & IEC/EN 61000-6-2	Test Location	Ground Plane 2	
Basic Standard	IEC 61000-4-4	Test Engineer	Jose A. Cuevas	
Test Voltage	5VDC	Date	7/11/2013	

Test Conditions	
Power Port	**N/A**
Highest Power Port Test Level	**N/A**
Highest Signal Port Test Level	**1kV**
Test Duration	**60sec**
Burst	**5/50ns 5kHz**
Performance Criteria	**A**
EUT Mode	**Powered up and measuring weight**

Direct Injection Output Path						
Test Level	L1	L2	PE	n/a	n/a	Comments

Test Level	Cable Description	Comments
1kV	**4 load cell cables**	**No susceptibility noted**
1kV	**Hardy C2 cable**	**No susceptibility noted**

Compliancy			
Compliant?	**Yes**	Additional Comments	

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6.3.2 HI6020IT-PS1

Client	Hardy Process Solutions			
NEx #	264569	Temperature	23	˚C
EUT Name	Hardy Load Cell Summing Box	Humidity	55	%
EUT Model	HI6020IT	Pressure	100.4	kPa
Governing Doc	IEC/EN 61326-1 & IEC/EN 61000-6-2	Test Location	Ground Plane 2	
Basic Standard	IEC 61000-4-4	Test Engineer	Jose A. Cuevas	
Test Voltage	5VDC	Date	7/11/2014	

Test Conditions	
Power Port	**N/A**
Highest Power Port Test Level	**N/A**
Highest Signal Port Test Level	**1kV**
Test Duration	**60sec**
Burst	**5/50ns 5kHz**
Performance Criteria	**A**
EUT Mode	**Powered up and measuring weight**

Direct Injection Output Path

Test Level	L1	L2	PE	n/a	n/a	Comments

Test Level	Cable Description	Comments
1kV	**4 load cell cables**	**Wrong readings during the test. Back to normal after test**
1kV	**Hardy C2 cable**	**Wrong readings during the test. Back to normal after test**

Compliancy

Compliant?	Yes	Additional Comments	**6020IT shows wrong readings up to hundreds of grams on the weight processor, but goes back to normal after test.**

6.3.3 List of Equipment

416, PEFT Jr.; E1015, Capacitive Coupling Clamp.

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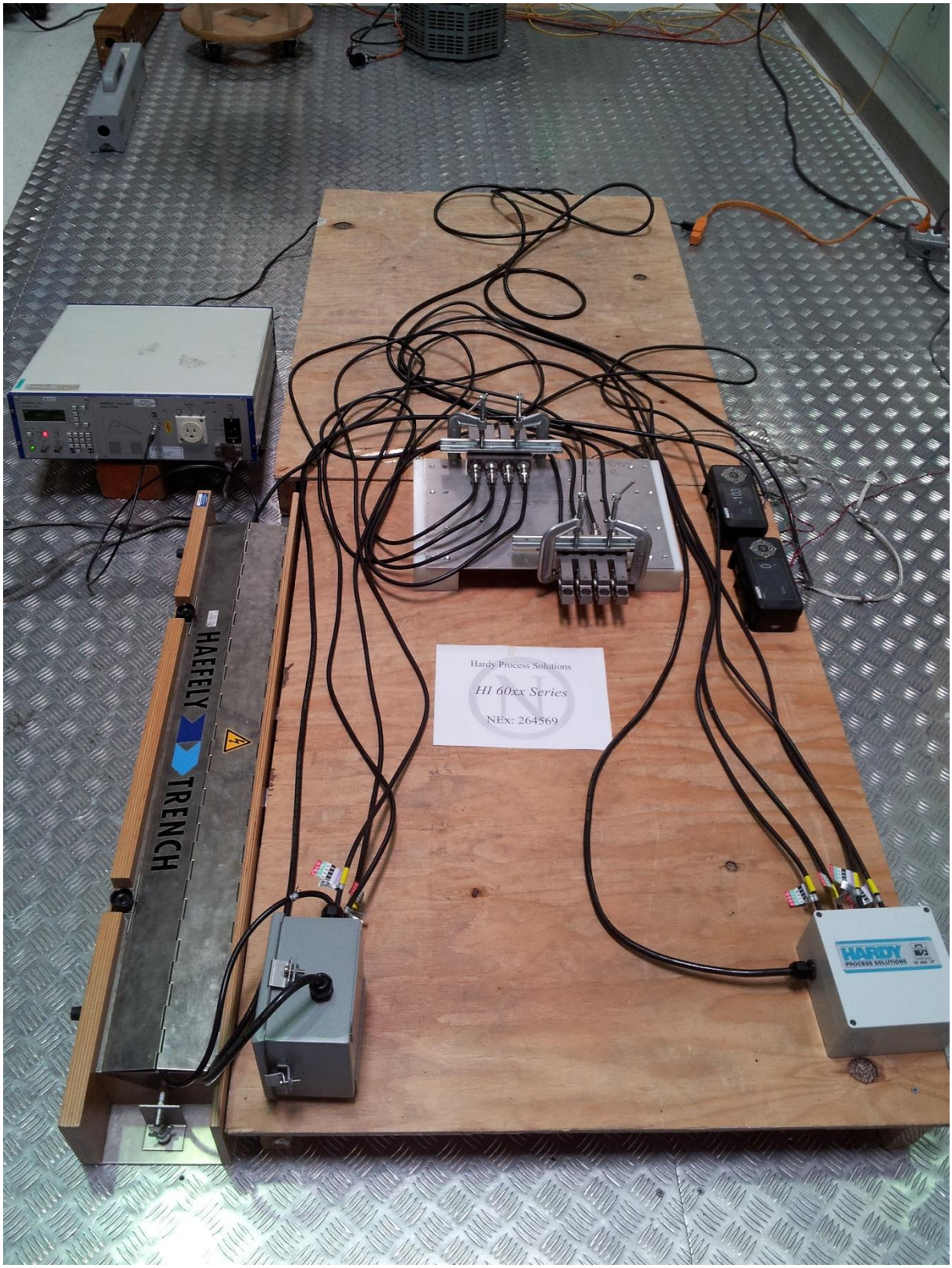
6.3.4 Reference Photos



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6.4 -6, RF Conducted Disturbance

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 product specific standard sets the level, duration, and the frequency range to apply.

6.4.1 HI6010IT-PC1

Client	Hardy Process Solutions			
NEx #	264569	Temperature	23	˚C
EUT Name	Hardy Load Cell Summing Box	Humidity	55	%
EUT Model	HI6010IT	Pressure	100.4	kPa
Governing Doc	IEC/EN 61326-1 & IEC/EN 61000-6-2	Test Location	Ground Plane 2	
Basic Standard	IEC 61000-4-6	Test Engineer	Jose A. Cuevas	
Test Voltage	5VDC	Date	7/11/2014	

Test Conditions	
Test Level	3VRMS
Modulation	80% AM
Frequency Range	150kHz - 80MHz
Selected Frequencies	none
Step	1%
Dwell Time	1kHz
Performance Criteria	A
EUT Mode	**Powered up and measuring weight**

No.	Injection Point	Injection Method	Comments
1	Load cell Cable 1	Clamp	No susceptibility noted
2	Load cell Cable 2	Clamp	No susceptibility noted
3	Load cell Cable 3	Clamp	No susceptibility noted
4	Load cell Cable 4	Clamp	No susceptibility noted
5	Hardy C2 cable	Clamp	No susceptibility noted

Compliancy			
Compliant?	Yes	Additional Comments	Complies after modifications.

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6.4.2 HI6020IT-PS1

Client	Hardy Process Solutions			
NEx #	264569	Temperature	23	˚C
EUT Name	Hardy Load Cell Summing Box	Humidity	55	%
EUT Model	HI6020IT	Pressure	100.4	kPa
Governing Doc	IEC/EN 61326-1 & IEC/EN 61000-6-2	Test Location	Ground Plane 2	
Basic Standard	IEC 61000-4-6	Test Engineer	Jose A. Cuevas	
Test Voltage	5VDC	Date	7/29/2014	

Test Conditions	
Test Level	3VRMS
Modulation	80% AM
Frequency Range	150kHz - 80MHz
Selected Frequencies	none
Step	1%
Dwell Time	1kHz
Performance Criteria	A
EUT Mode	**Powered up and measuring weight**

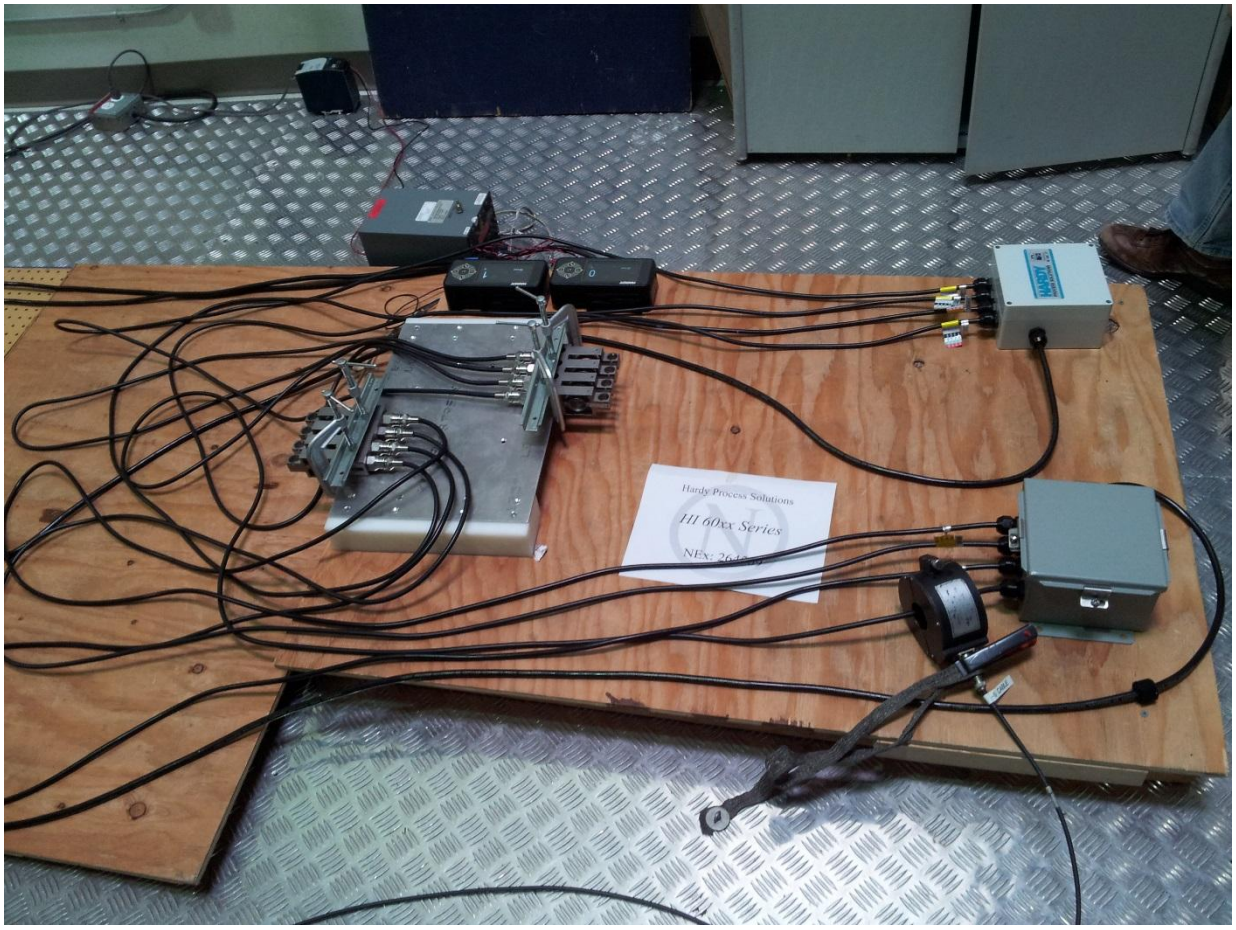
No.	Injection Point	Injection Method	Comments
1	Load cell Cable 1	Clamp	No susceptibility noted
2	Load cell Cable 2	Clamp	No susceptibility noted
3	Load cell Cable 3	Clamp	No susceptibility noted
4	Load cell Cable 4	Clamp	No susceptibility noted
5	Hardy C2 cable	Clamp	No susceptibility noted

Compliancy			
Compliant?	Yes	Additional Comments	Complies after modifications.

6.4.3 List of Equipment

948, Signal Generator; 913, RF Amplifier; 472, CDN; 436, Current Injection Probe.

6.4.4 Reference Photos



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6.5 -8, Power Frequency; Magnetic

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 EUT was exposed to 50 Hz and 60Hz power frequency magnetic fields, to the level required by the product specific standard.

6.5.1 Power Frequency Magnetic Field Test Results

Client	Hardy Process Solutions			
NEx #	264569	Temperature	23	˚C
EUT Name	Hardy Load Cell Summing Box	Humidity	55	%
EUT Model	HI 60xx Series	Pressure	100.4	kPa
Governing Doc	IEC/EN 61326-1 & IEC/EN 61000-6-2	Test Location	ESD Plane	
Basic Standard	IEC 61000-4-8	Test Engineer	Jose A. Cuevas	
Test Voltage	5VDC	Date	7/11/2014	

Test Conditions	
Test Level	30 amps (rms) per meter
Frequency	50Hz and 60Hz
Duration Per Axis	5min
Performance Criteria	A
EUT Mode	**Powered up and measuring weight**

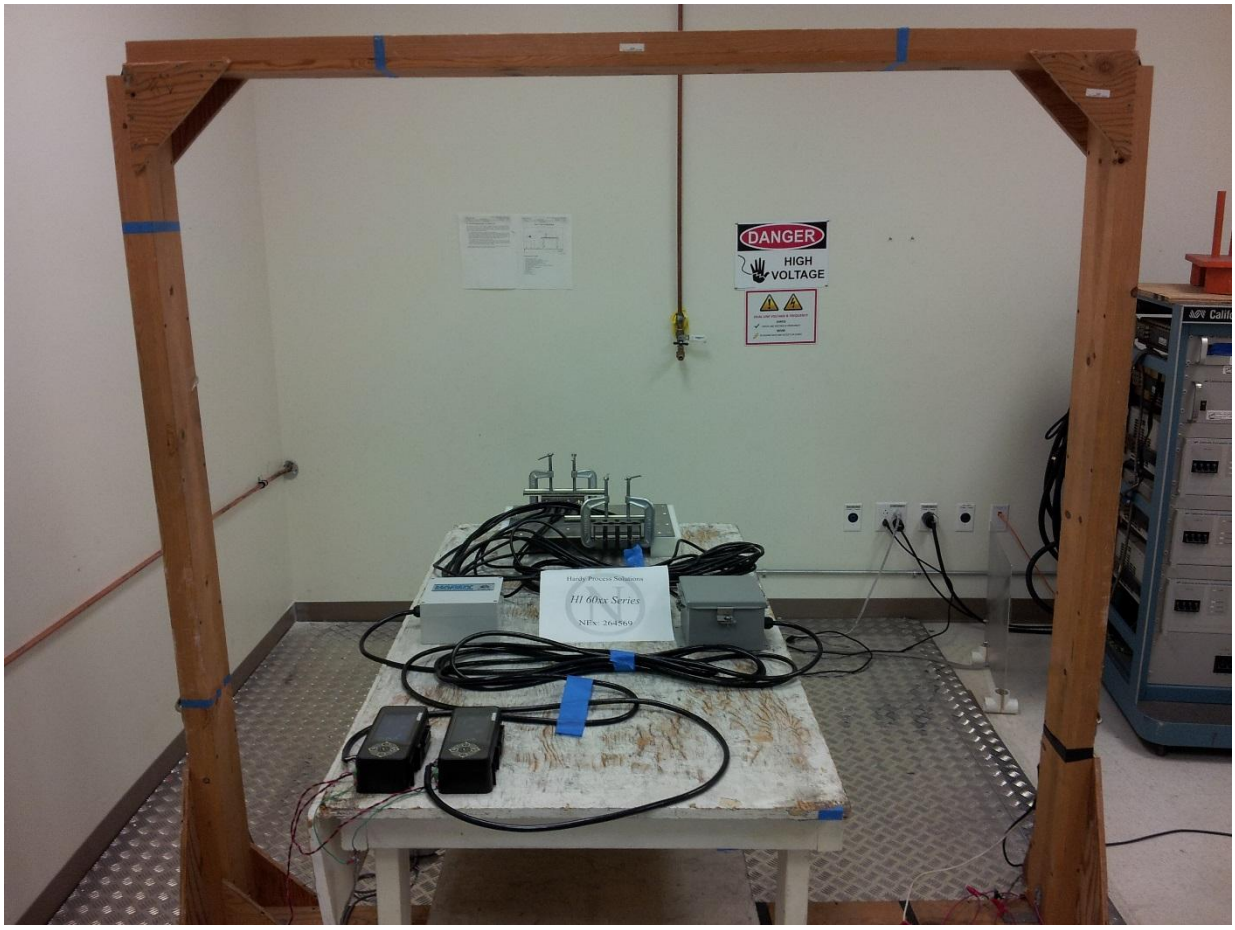
Text Axis	Compliant	Comments
X	Yes	No susceptibility noted
Y	Yes	No susceptibility noted
Z	Yes	No susceptibility noted

Compliancy			
Compliant?	Yes	Additional Comments	

6.5.2 List of Equipment

851, Exposure Level Tester; 962, AC Power Source; E1016, 100 Watt Audio Amplifier.

6.5.3 Reference Photos



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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

Conducted and Radiated Emissions Measurement Detection Systems	Applicable Frequency Range	"U” 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, 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

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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 measurement 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:

- ANSI Z540.2 (2002) Guide to the Expression of Uncertainty in Measurement
- NIS 81:1994, The Treatment of Uncertainty in EMC Measurements (NAMAS, 1994)
- 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.

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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:

- 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,
- 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,
- 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
- 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 traceabilty to NIST, ensuring that adequate and repeatable calibration procedures are being applied, and verifying conformity with the other requirements of ISO Guide 25).

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.