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Test report

282291-1TRFEMC

Date of issue: April 1, 2015

Applicant:

Dextera Labs Inc.

Product:

Video Conferencing Unit

Model:

4K2USB3

Specification:

Agreement of Voluntary Control Council for Interference by Information Technology Equipment

April 2013 V – 3 / 2013.04

Normative Annex 1: Technical Requirements

Lab and test locations

Company name	Nemko Canada Inc.		
Designation number	CA2040		
VCCI registration number	R-2661 (3m Electromagnetic interference chamber – Radiated disturbance) C-2911 (Conducted site, Electromagnetic interference chamber – mains ports conducted disturbance measurements) T-402 (Radiated site, Ottawa Telecom - Telecommunication ports conducted disturbance measurements) G-417 (3m Electromagnetic interference chamber – Radiated disturbance above 1 GHz)		
Facility Name	Ottawa	Montreal	Almonte
Address	303 River Road	292 Labrosse Ave	1500 Peter Robinson Rd.
City	Ottawa	Pointe-Claire	West Carleton
Province	ON	QC	ON
Postal code	K1V 1H2	H9R 5L8	K0A 1L0
Country	Canada	Canada	Canada
Telephone	+1 613 737 9680	+1 514 694 2684	+1 613 256-9117
Facsimile	+1 613 737 9691	+1 514 694 3528	+1 613 256-8848
Toll free	+1 800 563 6336		
Website	www.nemko.com		

Tested by	Predrag Golic, EMC Specialist
Reviewed by	Andrey Adelberg, Senior Wireless/EMC Specialist
Review date	April 1, 2015
Reviewer signature	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Copyright notification

Table of Contents

Section 1 Report summary

1.1 Test specifications

Agreement of Voluntary Control Council for Interference by Information Technology Equipment

- April 2013 V – 3 / 2013.04
- Normative Annex 1: Technical Requirements

1.2 Exclusions

None

1.3 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

1.4 Test report revision history

Table 1.4-1: *Test report revision history*

Revision #	Details of changes made to test report
TRF	Original report issued

Section 2 Summary of test results

2.1 Results

Table 2.1-1: *Disturbance results*

Test description	Verdict
Radiated disturbance	Pass [1]
Conducted disturbance at mains port	Pass [1]
Conducted common mode (asymmetric mode) disturbance at telecommunication ports	Not applicable [2]

Notes: System Power: Radiated: 100 VAC/60 Hz, Conducted: 100 VAC/60 Hz and 100 VAC/50 Hz

[1] Product classification A

[2] The EUT does not contain any telecommunication ports

Section 3 Equipment under test (EUT) details

3.1 Applicant and Manufacturer

Company name	Dextera Labs Inc.
Address	#104 – 3175 ch. Quatre-Bourgeois
City	Quebec
Province/State	Quebec
Postal/Zip code	G1W 2K7
Country	Canada

3.2 Sample information

Receipt date	March 26, 2015
Nemko sample ID number	133-000693

3.3 EUT information

Product name	Video Conferencing Unit
Model	4K2USB3
Serial number	LD1434A073
Power requirements	5 V_{DC} [Powered through computer]
Description/theory of operation	Video processor that converts a HDMI video signal to a USB 3.0 stream.
Operational frequencies	148.5 MHz, 100 MHz
Software details	Internal processor code is pre-programmed at the factory.

3.4 EUT exercise and monitoring details

The HDMI video signal was provided by a camera The USB 3.0 bus was connected to a desktop computer that captures and displays the real-time video image of the camera, which was monitored during testing.

The power to the EUT was provided by the USB connection.

3.5 EUT setup details

Table 3.5-1: *EUT sub assemblies*

Description	Brand name	Model/Part number	Serial number	Rev.
Video conferencing unit	Inogeni	4K2USB3	LD1434a073	None

Table 3.5-2: *EUT interface ports*

Description	Qty.
USB 3.0 port	1
HDMI port	1
AC input of the computer	1

Table 3.5-3: *Support equipment*

Description	Brand name	Model/Part number	Serial number	Rev.
Computer	Dell	D075	None	None
Keyboard	Keytronic	KT800U2	C085200325	None
Mouse	Microsoft	3902C693	None	None
Monitor	Samsung	932BF S	PE19HVFP204907E	None
Camera	Sony	EVI-HD7V	100181	None

Table 3.5-4: *Inter-connection cables*

Cable description	From	To	Length (m)
DVI to HDMI cable	EUT [HDMI port]	Camera	5
USB 3.0 cable	EUT [USB 3.0 port]	Computer	5
AC cable	Computer [AC input]	AC mains	1.5

3.5 EUT setup details, continued

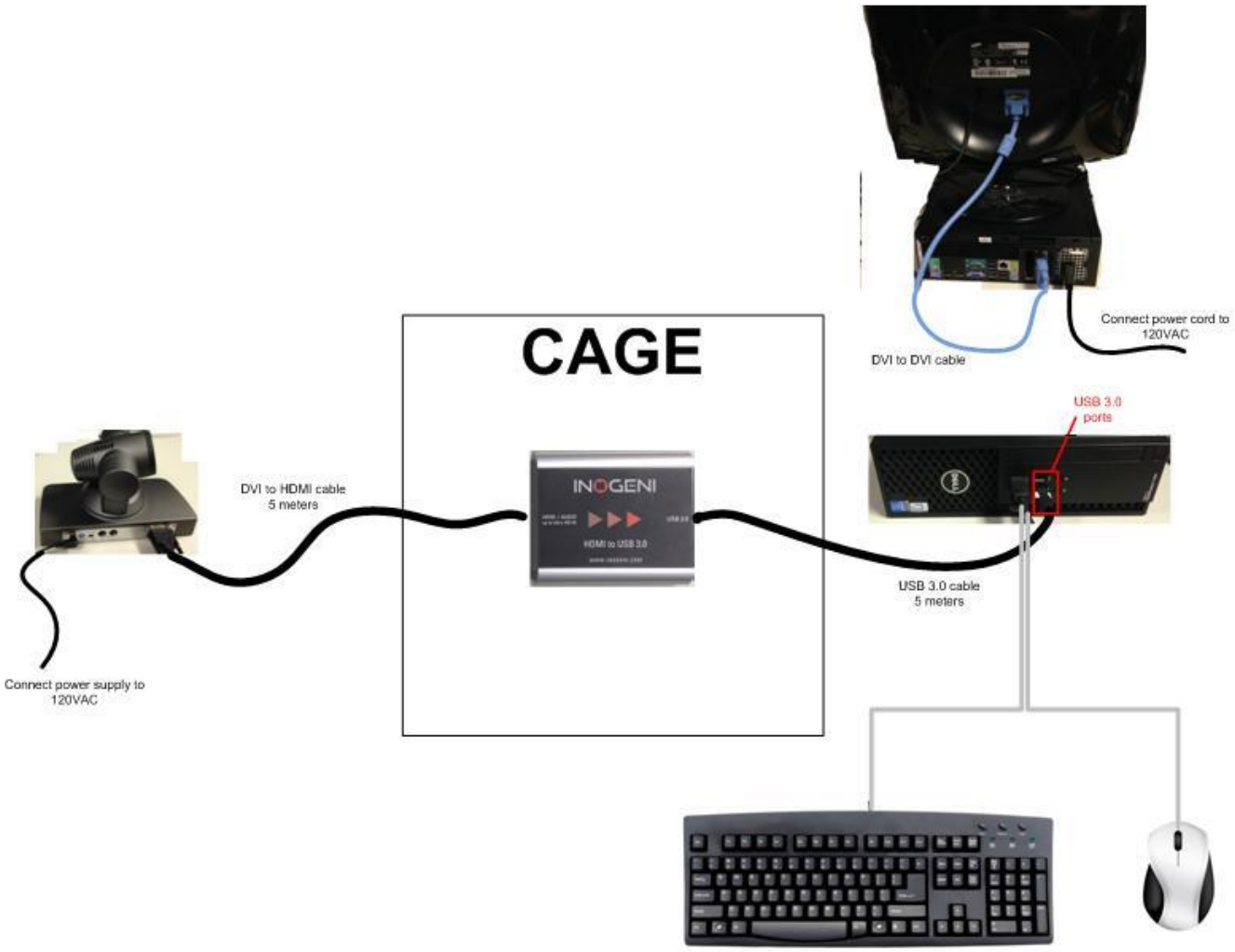


Figure 3.5-1: *Setup diagram*

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5 Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Nemko Canada Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 “Uncertainty in EMC measurements.” Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Section 7 Terms and definitions

7.1 Product classifications definitions

Class A digital device.	A digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device which is marketed for use by the general public or is intended to be used in the home.
Class B digital device.	A digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such devices include, but are not limited to, personal computers, calculators, and similar electronic devices that are marketed for use by the general public. Note: The responsible party may also qualify a device intended to be marketed in a commercial, business or industrial environment as a Class B device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B digital device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B digital device, regardless of its intended use.

7.2 General definitions

Information technology equipment (ITE)	Any equipment: a) Which has a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control, of data and of telecommunication messages and which may be equipped with one or more terminal ports typically operated for information transfer; b) With a rated supply voltage not exceeding 600 V. It includes, for example, data processing equipment, office machines, electronic business equipment and telecommunication equipment.
Telecommunications/network port	Point of connection for voice, data and signaling transfers intended to interconnect widely dispersed systems via such means as direct connection to multi-user telecommunications networks (e.g. public switched telecommunications networks (PSTN) integrated services digital networks (ISDN), x-type digital subscriber lines (xDSL), etc.), local area networks (e.g. Ethernet, Token Ring, etc.) and similar networks NOTE A port generally intended for interconnection of components of an ITE system under test (e.g. RS-232, IEEE Standard 1284 (parallel printer), Universal Serial Bus (USB), IEEE Standard 1394 (“Fire Wire”), etc.) and used in accordance with its functional specifications (e.g. for the maximum length of cable connected to it), is not considered to be a telecommunications/network port under this definition.

Section 8 Testing data

8.1 Radiated disturbance

8.1.1 References

CISPR 22

8.1.2 Test summary

Verdict	Pass		
Test date	March 26, 2015	Temperature	22 °C
Test engineer	Predrag Golic	Air pressure	995 mbar
Test location	Ottawa	Relative humidity	31 %

8.1.3 Notes

None

8.1.4 Setup details

EUT setup configuration	Table top
AC mains input	$100V_{AC}$ 60Hz
Test facility	3 m Semi anechoic chamber
Measuring distance	3
Antenna height variation	1–4 m
Turn table position	0–360°
Measurement details	A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver/spectrum analyzer settings for frequencies below 1 GHz:

Resolution bandwidth	120 kHz
Video bandwidth	300 kHz
Detector mode	Peak (preview measurement); Quasi-peak (final measurement)
Trace mode	Max Hold
Measurement time	100 ms (preview measurement); 1000 ms (final measurement)

Receiver/spectrum analyzer settings for frequencies above 1 GHz:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	Peak (preview); Peak and Average (final)
Trace mode	Max Hold
Measurement time	100 ms (preview); 1000 ms (final)

8.1.4 Setup details, continued

Table 8.1-1: *Radiated disturbance equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Feb. 25/16
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
Power source	California Instruments	3001i	FA001021	1 year	June 27/15
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	Jan. 07/16
Biconical antenna (30–300 MHz)	Sunol	BC2	FA002078	1 year	Feb. 10/16
Log periodic antenna (200–5000 MHz)	Sunol	LP5	FA002077	1 year	Feb. 09/16
Horn antenna (1–18 GHz)	EMCO	3115	FA000649	1 year	April 25/15
Pre-amplifier (1–18 GHz)	JCA	JCA118-503	FA002091	1 year	June 23/15
50 Ω coax cable	C.C.A.	None	FA002555	1 year	June 23/15
50 Ω coax cable	Huber + Suhner	None	FA002074	1 year	June 23/15

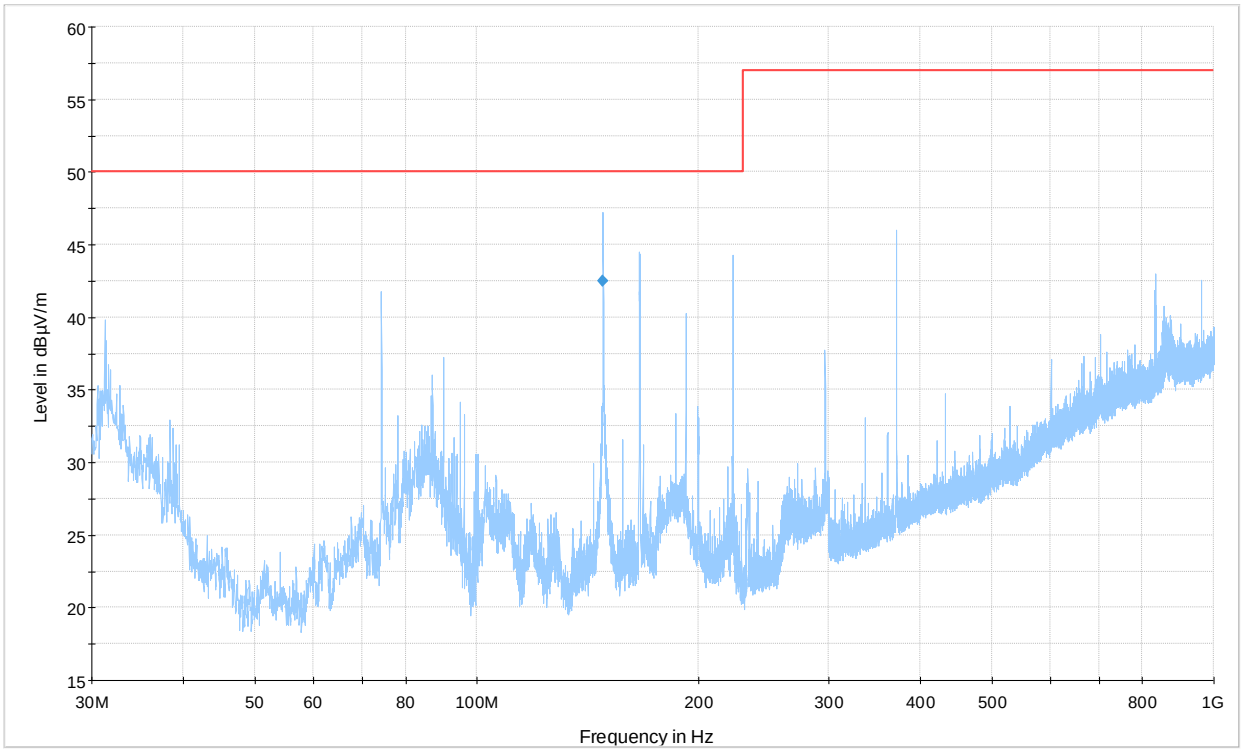
Notes: NCR - no calibration required

Table 8.1-2: *Radiated disturbance test software details*

Manufacturer of Software	Details
Rhode & Schwarz	EMC32, Software for EMC Measurements, Version 8.53.0

Notes: None

8.1.5 Test data



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Figure 8.1-1: *Radiated disturbance spectral plot (30 to 1000 MHz)*

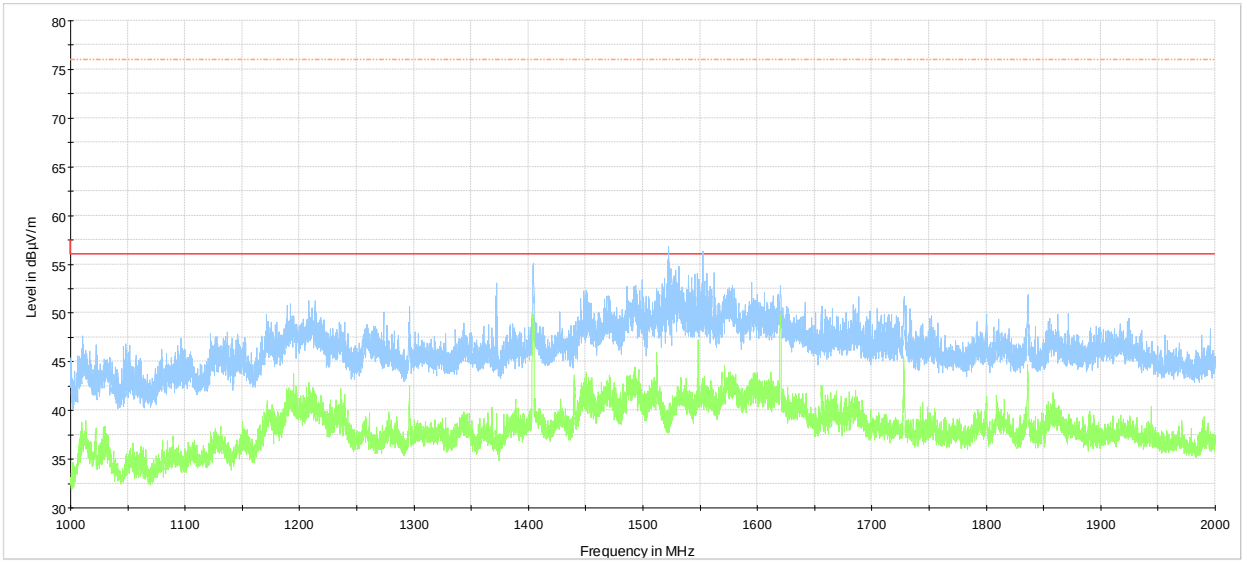
Table 8.1-3: *Radiated disturbance (Quasi-Peak) results*

Frequency (MHz)	Quasi-Peak field strength[1] (dBµV/m)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor[2] (dB)	Margin (dB)	3 m Quasi-Peak limit (dBµV/m)
148.36	42.5	1000	120	150	H	0	13.9	7.5	50.0

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)
[2] Correction factor = antenna factor ACF (dB) + cable loss (dB)

Sample calculation: 42.5 dBµV/m (field strength) = 28.6 dBµV (receiver reading) + 13.9 dB (Correction factor)

8.1.5 Test data, continued



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators.

Figure 8.1-2: *Radiated disturbance spectral plot (1 to 2 GHz)*

8.1.6 Setup photos

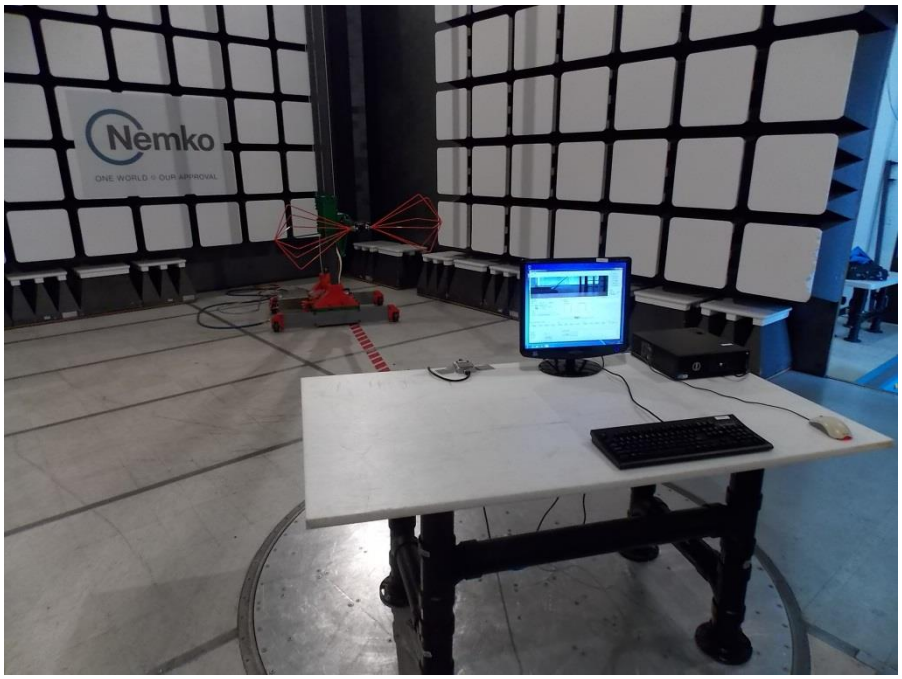


Figure 8.1-3: *Radiated disturbance setup photo*

Figure 8.1-4: *Radiated disturbance setup photo*

8.1.6 Setup photos, continued

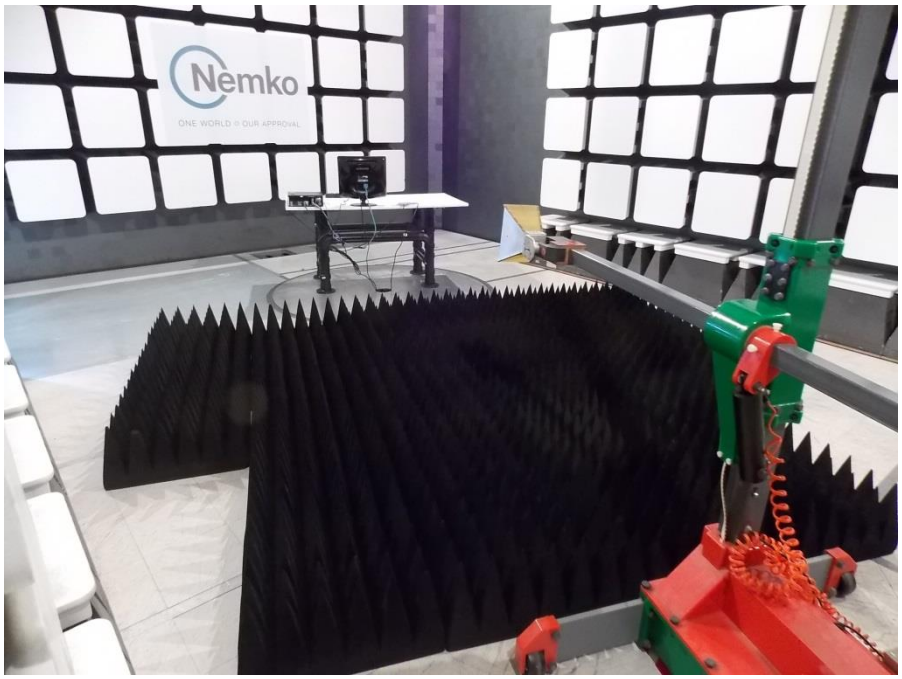


Figure 8.1-5: *Radiated disturbance setup photo*

8.2 Conducted disturbance at mains port

8.2.1 References

CISPR 22

8.2.2 Test summary

Verdict	Pass		
Test date	March 26, 2015	Temperature	22 °C
Test engineer	Predrag Golic	Air pressure	1000 mbar
Test location	Ottawa	Relative humidity	30 %

8.2.3 Notes

None

8.2.4 Setup details

Port under test	AC input of the computer
EUT setup configuration	Table top
AC mains input	100 V_{AC} 50 Hz; 100 V_{AC} 60 Hz
Measurement details	A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver settings:

Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Detector mode	Peak and Average (preview measurement); Quasi-peak and Average (final measurement)
Trace mode	Max Hold
Measurement time	100 ms (preview measurement); 1000 ms (final measurement)

Table 8.2-1: *Conducted disturbance at mains port equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	Jan. 07/16
Power source	California Instruments	3001i	FA001021	1 year	June 27/15
LISN	Rohde & Schwarz	ENV216	FA002023	1 year	Jan. 09/16
50 Ω coax cable	C.C.A.	None	FA002556	1 year	June 23/15

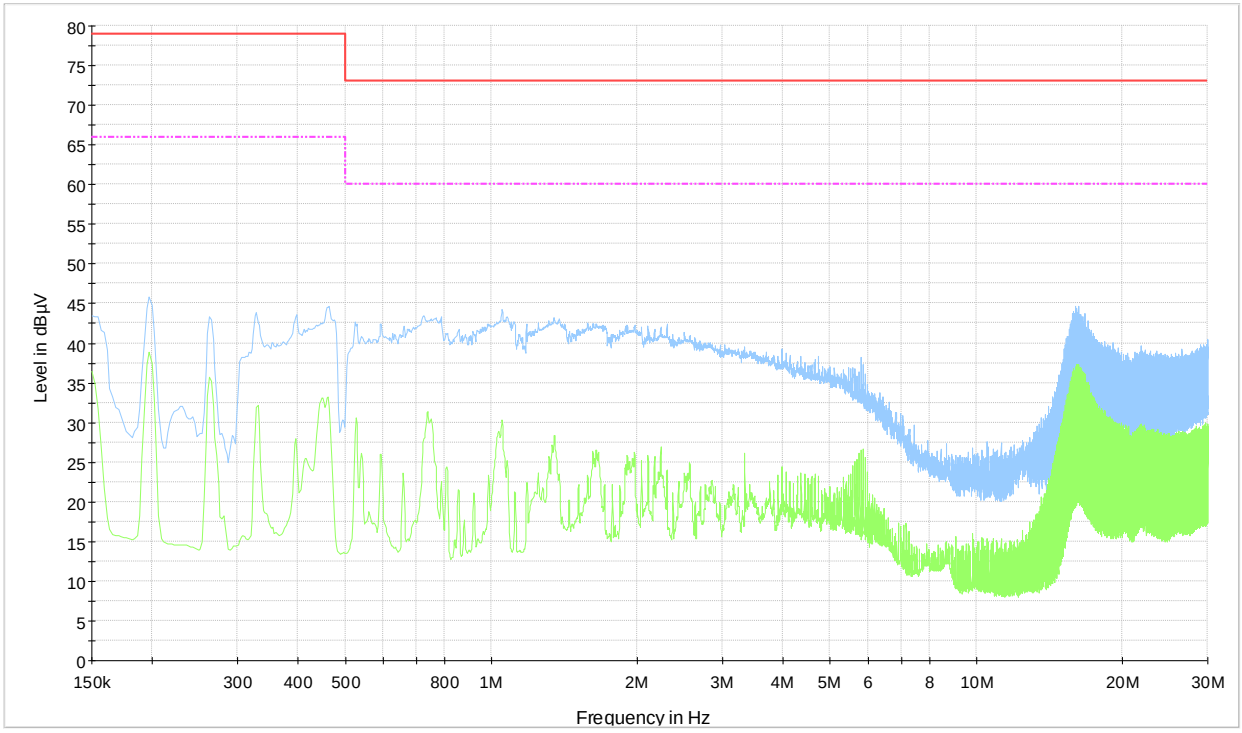
Notes: None

Table 8.2-2: *Conducted disturbance at mains port test software details*

Manufacturer of Software	Details
Rhode & Schwarz	EMC32, Software for EMC Measurements, Version 8.53.0

Notes: None

8.2.5 Test data

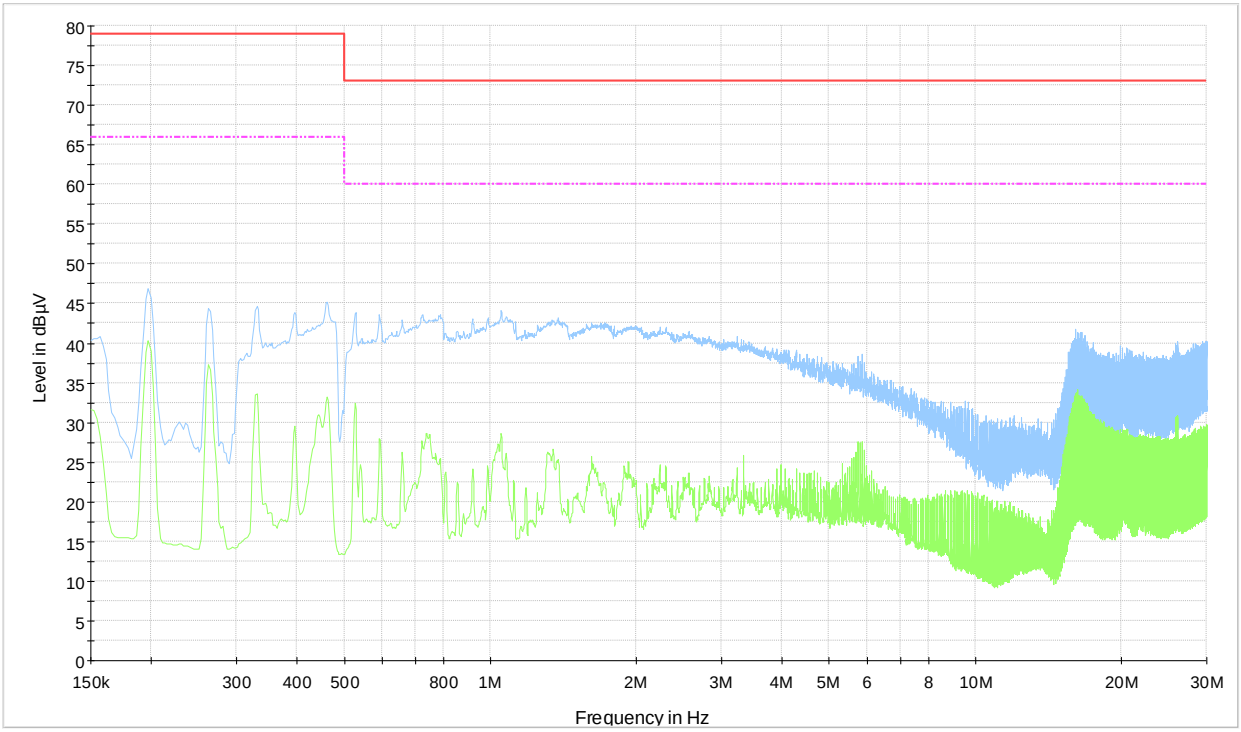


5R282291 - CE 100VAC 50Hz - Phase
CISPR 22 Mains QP Class A
CISPR 22 Mains AV Class A
Preview Result 1-PK+
Preview Result 2-AVG

The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Figure 8.2-1: *Conducted disturbance at mains port spectral plot on phase line*

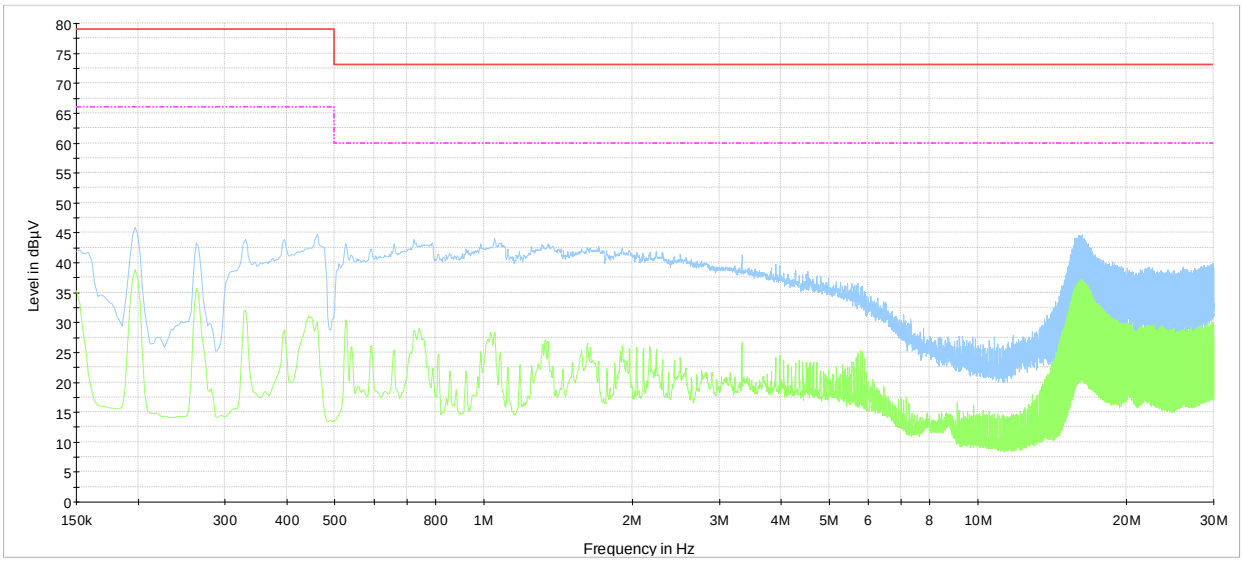
8.2.5 Test data, continued



The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Figure 8.2-2: *Conducted disturbance at mains port spectral plot on neutral line*

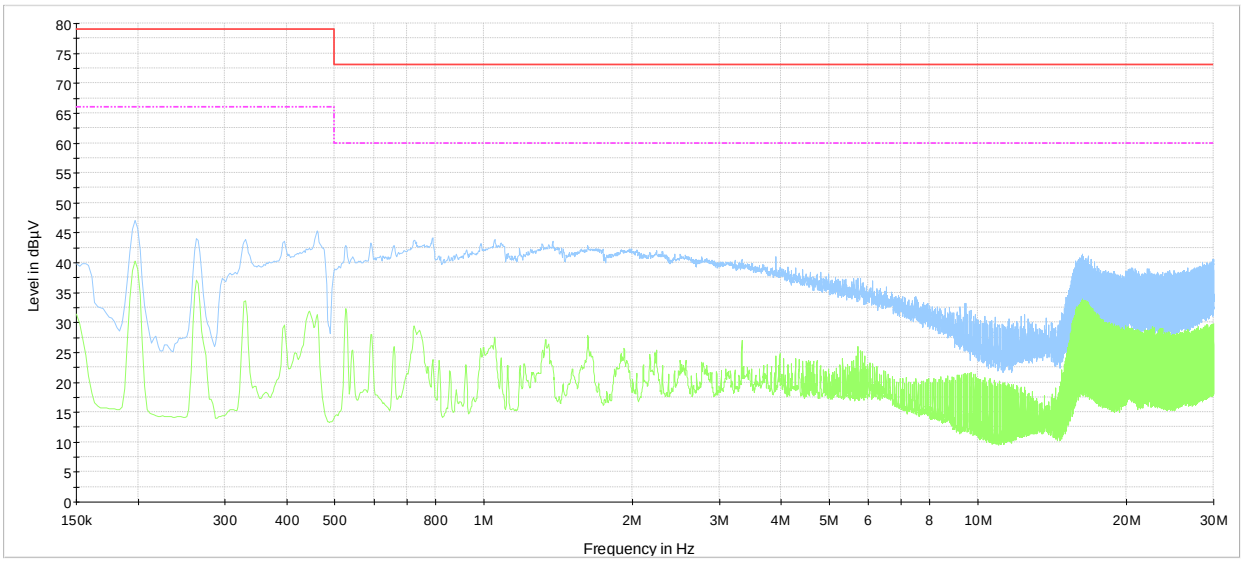
8.2.5 Test data, continued



The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Figure 8.2-3: *Conducted disturbance at mains port spectral plot on phase line*

8.2.5 Test data, continued



The spectral plot has been corrected with transducer factors. (i.e. cable loss, LISN factors, and attenuators)

Figure 8.2-4: *Conducted disturbance at mains port spectral plot on neutral line*

8.2.6 Setup photos

Figure 8.2-5: *Conducted disturbance at mains port setup photo*

Figure 8.2-6: *Conducted disturbance at mains port setup photo*

Section 9 EUT photos

9.1 External photos

Figure 9.1-1: *EUT photos*

9.2 Internal photos

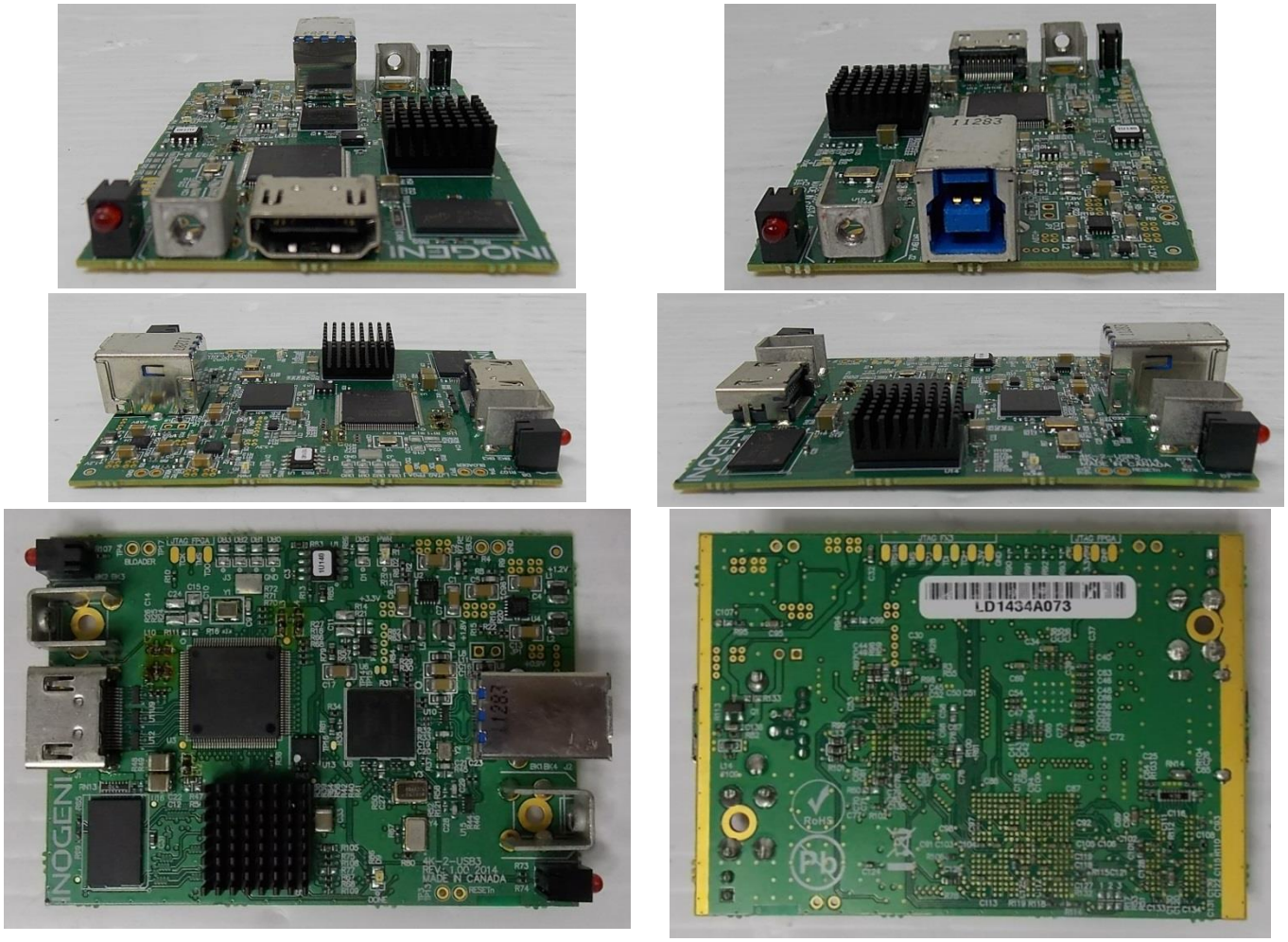


Figure 9.2-1: *Main Board photos*