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EMC TEST REPORT – 369141-1R1TRFEMC

Applicant:

ESKI Inc.

Product name:

WASH

Model:	FCC ID:	IC ID:
WASH 3.5	2ADS4WASH	7254AWASH

Model Variant:

WASH 3.0

Specifications:

- FCC 47 CFR Part 15, Subpart B – Verification
- ICES-003 Issue 6 January 2016

Date of issue: February 26, 2019

Test engineer(s):	Daniel Hynes, Senior EMC Specialist	Signature:	Daniel Hynes
Reviewed by:	Yong Huang, Wireless/EMC Specialist	Signature:	

Lab and test locations

Company name	Nemko Canada Inc.			
Facilities	Ottawa site: 303 River Road Ottawa, Ontario Canada K1V 1H2 Tel: +1 613 737 9680 Fax: +1 613 737 9691	Montréal site : 292 Labrosse Avenue Pointe-Claire, Québec Canada H9R 5L8 Tel: +1 514 694 2684 Fax: +1 514 694 3528	Toronto site: 1-130 Saltsman Drive Cambridge, Ontario Canada N3E 0B2 Tel: +1 519 650 4811	Almonte site: 1500 Peter Robinson Road West Carleton, Ontario Canada K0A 1L0 Tel: +1 613 256-9117 Fax: +1 613 256-8848
Test site registration	**Organization**	**Recognition numbers and location**		
	FCC	CA2040 (Ottawa); CA2041 (Montreal)		
	ISED	CA2040A-4 (Ottawa); CA2040G-5 (Montreal); CA2040A-3 (Almonte)		
Website	www.nemko.com			

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 contained 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

FCC 47 CFR Part 15, Subpart B – Verification	Title 47: Telecommunication; Part 15—Radio Frequency Devices
ICES-003 Issue 6 January 2016	Information Technology Equipment (ITE) – Limits and methods of measurement

1.2 Exclusions

None

1.3 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.2 above. 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 #	Date of issue	Details of changes made to test report
TRF	February 8, 2019	Original report issued
R1TRF	February 26, 2019	Model variant added to the test report

Section 2 Summary of test results

2.1 Testing period

Test start date	February 4, 2019
Test end date	February 4, 2019

2.2 North America test results

Table 2.2-1: *Result summary for emissions*

Standard	Clause	Test description	Verdict
FCC 47 CFR Part 15, Subpart B	§15.109	Radiated emissions limits[1]	Pass
FCC 47 CFR Part 15, Subpart B	§15.107	Conducted emissions limits (AC mains) [1]	Pass
ICES-003 Issue 6	6.1	AC Power Line Conducted Emissions Limits[1]	Pass
ICES-003 Issue 6	6.2	Radiated Emissions Limits[1]	Pass

Notes: [1] Product classification A

Section 3 Equipment under test (EUT) details

3.1 Applicant

Company name	ESKI Inc.
Address	103 rue Louvain Ouest Montreal, Quebec Canada H2N 1A3

3.2 Manufacturer

Company name	ESKI Inc.
Address	103 rue Louvain Ouest Montreal, Quebec Canada H2N 1A3

3.3 Sample information

Receipt date	February 4, 2019
Nemko sample ID number	Item # 1

3.4 EUT information

Product name	WASH
FCC ID	2ADS4WASH
IC ID	7254AWASH
Model	WASH 3.5
Model variant	WASH 3.0
Serial number	CF-072
Power requirements	100-240 V_{AC}, 50/60 Hz
Description/theory of operation	Infrared transmitter that controls PIXMOB luminous objects wirelessly; similarly to a LED flood light it is controllable by a lighting board through DMX.
Operational frequencies	8 MHz, 20 MHz
Software details	Firmware version 1.8.9

3.5 EUT setup details

EUT description of the methods used to exercise the EUT and all relevant ports:

- Send continuous DMX commands to light up wristbands (blue bumps) via wash tester program and an ENTTEC USB to DMX adapter.

EUT setup/configuration rationale:

- The EUT setup in a configuration that was expected to produce the highest amplitude emissions relative to the limit and that satisfy normal operation/installation practice by the end user.
- The type and construction of cables used in the measurement set-up were consistent with normal or typical use. Cables with mitigation features (for example, screening, tighter/more twists per length, ferrite beads) have been noted below:
  - The following deviations were:
  - None
- The EUT was setup in a manner that was consistent with its typical arrangement and use. The measurement arrangement of the EUT, local AE and associated cabling was representative of normal practice. Any deviations from typical arrangements have been noted below:
  - The following deviations were:
  - None

EUT monitoring method:

- A wristband was used to confirm it was operating when the wristband would light up. IR operation was also observed via remote monitor.

3.5 EUT setup details, continued

Table 3.5-1: *EUT sub assemblies*

Description	Brand name	Model, Part number, Serial number, Revision level
WASH	PIXMOB	MN: WASH 3.5, SN: CF-072

Table 3.5-2: *EUT interface ports*

Description	Qty.
SP 21 (AC Mains) Port – IN	1
SP 21 (AC Mains) Port - OUT	1
XLR (DMX) Port - IN	1
XLR (DMX) Port – OUT	1

Table 3.5-3: *Support equipment*

Description	Brand name	Model, Part number, Serial number, Revision level
Laptop Computer	Apple	MN: MacBook Air, SN: C02SW00HH3QF
DMX512/RDM to USB 2.0 Interface	ENTTEC	MN: DMXUSB PRO, SN: 2159076

Table 3.5-4: *Inter-connection cables*

Cable description	From	To	Length (m)
XLR Cable	XLR (DMX) Port - IN	DMX512/RDM to USB 2.0 Interface	10
3 Conductor AC Power Cable	SP 21 (AC Mains) Port – IN	AC Source	2
XLR Cable	XLR (DMX) Port – OUT	Un-terminated	1
3 Conductor AC Power Cable	SP 21 (AC Mains) Port - OUT	Un-terminated	1

3.5 EUT setup details, continued

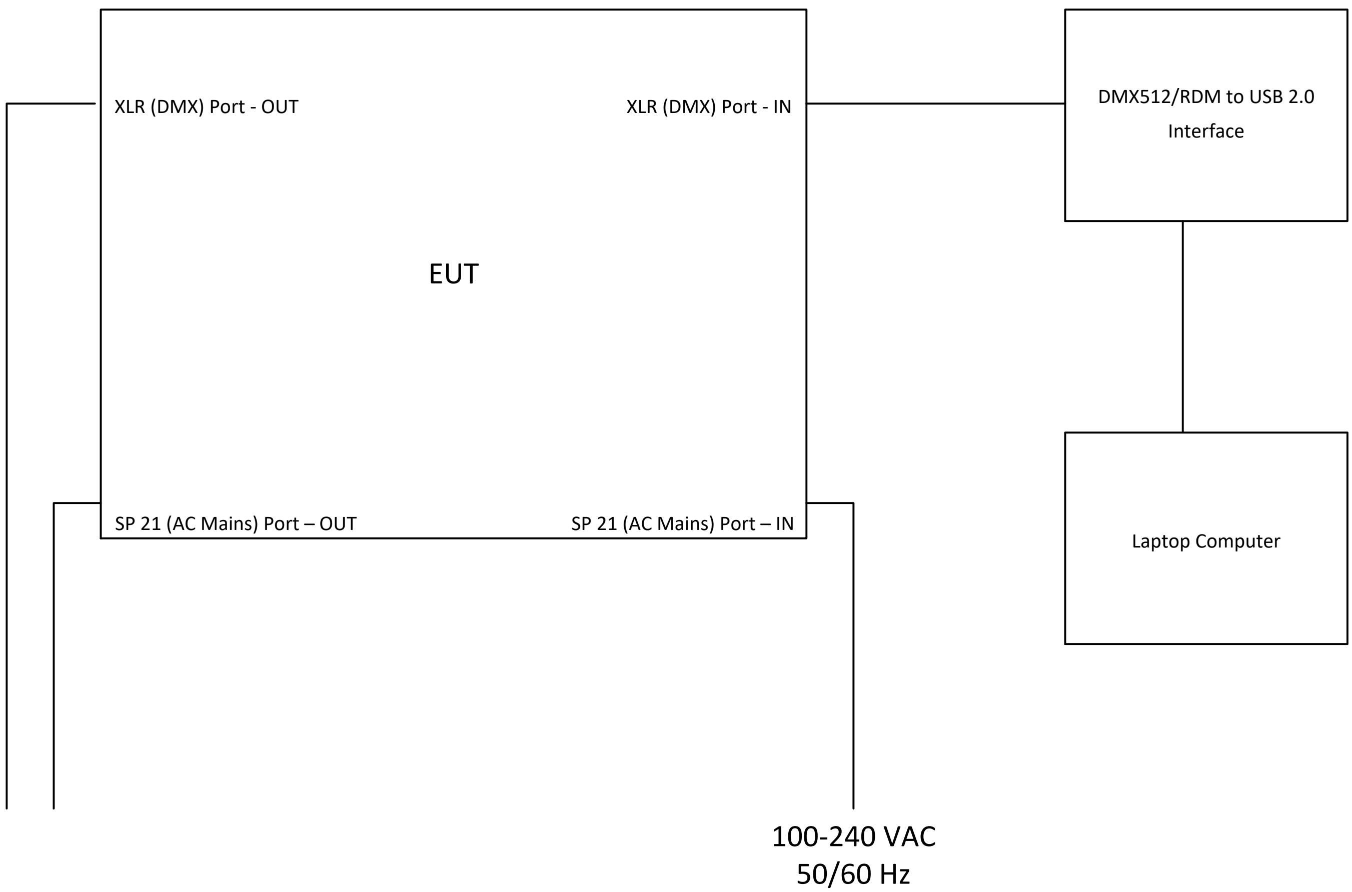


Figure 3.5-1: *block diagram*

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT for compliance

The following modifications were performed by client in order to comply with radiated emissions requirements:
A single Wurth ferrite PN: 742 717 22 placed on both AC power cables at the unit side
A single Wurth ferrite PN: 742 717 33 placed on both XLR cables at the unit side

4.2 Technical judgment

WASH 3.0 versus WASH 3.5:

The Controllers are pretty the same. They have the same micro-controller (Atmega644) and same crystal (20Mhz). The only differences between them is a better electronics debounce, better signal filter and a better DC-DC converter for the WASH 3.5. This is the same DMX signal input in both of them.

There is no driver-filter on the WASH 3.0 because it is less powerful (less IR LED) than the WASH 3.5.

The WASH 3.0 has 36 IR LEDS (SFH4233) and the WASH 3.5 has 90 IR LEDS (SFH4725S) with a better heatsink.

The powers supplies are different because the number of IR LED is different. The Wash 3.0 use the RS-75-24 that has an output of 24V and the WASH 3.5 use the RPS-300-48 that has an output of 48V.

The casing and cables connectors are the same on both WASH 3.0 and WASH 3.5.

The labels are placed at the same place on both casing. Only the ID and the model change on the label.

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 16-4-2 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Measurement instrumentation uncertainty. The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Table 6.1-1: *Measurement uncertainty calculations*

Measurement		U_{cispr} dB	U_{lab} dB			
			Ottawa	**Montreal**	**Toronto**	**Almonte**
Conducted disturbance at AC mains and other port power using a V-AMN	(9 kHz to 150 kHz)	3.8	2.9	2.8	2.8	N/A
	(150 kHz to 30 MHz)	3.4	2.3	2.2	2.2	N/A
Conducted disturbance at telecommunication port using AAN	(150 kHz to 30 MHz)	5.0	4.3	4.3	4.3	N/A
Conducted disturbance at telecommunication port using CVP	(150 kHz to 30 MHz)	3.9	2.9	2.8	2.8	N/A
Conducted disturbance at telecommunication port using CP	(150 kHz to 30 MHz)	2.9	1.4	1.1	1.1	N/A
Conducted disturbance at telecommunication port using CP and CVP	(150 kHz to 30 MHz)	4.0	3.1	3.0	3.0	N/A
Disturbance power	(30 MHz to 300 MHz)	4.0	3.7	3.7	3.7	N/A
Radiated disturbance (electric field strength at an OATS or in a SAC)	(30 MHz to 1 GHz)	6.3	5.7	5.5	5.5	5.5
Radiated disturbance (electric field strength in a FAR)	(1 GHz to 6 GHz)	5.2	4.8	5.1	4.8	N/A
Radiated disturbance (electric field strength in a FAR)	(6 GHz to 18 GHz)	5.5	5.1	5.0	4.7	N/A

Notes: Compliance assessment:

If U_{lab} is less than or equal to U_{cispr} then:

- compliance is deemed to occur is no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit

If U_{lab} is greater than U_{cispr} then:

- compliance is deemed to occur is no measured disturbance level, increased by (U_{lab} - U_{cispr}), exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by (U_{lab} - U_{cispr}), exceeds the disturbance limit

Section 7 Terms and definitions

7.1 Product classifications definitions

7.1.1 Title 47: Telecommunication – Part 15-Radio Frequency devices, Subpart A – General – Equipment classification

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.

7.1.2 ICES-003 – Equipment classification

Class B ITE	limits of radio noise for ITE for residential operation
Class A ITE	limits of radio noise for ITE for non-residential operation
Conditions	Only ITE intended strictly for non-residential use in commercial, industrial or business environments, and whose design or other characteristics strongly preclude the possibility of its use in a residential environment, shall be permitted to comply with the less stringent Class A limits. All ITE that cannot meet the conditions for Class A operation shall comply with the Class B limits. The ITE shall comply with both the power line – conducted and the radiated emissions limits within the same Class, with no intermixing.

7.2 General definitions

7.2.1 Title 47: Telecommunication – Part 15-Radio Frequency devices, Subpart A – General – Digital device definitions

Digital device (Previously defined as a computing device)	An unintentional radiator (device or system) that generates and uses timing signals or pulses at a rate in excess of 9,000 pulses (cycles) per second and uses digital techniques; inclusive of telephone equipment that uses digital techniques or any device or system that generates and uses radio frequency energy for the purpose of performing data processing functions, such as electronic computations, operations, transformations, recording, filing, sorting, storage, retrieval, or transfer. A radio frequency device that is specifically subject to an emanation requirement in any other FCC Rule part or an intentional radiator subject to subpart C of this part that contains a digital device is not subject to the standards for digital devices, provided the digital device is used only to enable operation of the radio frequency device and the digital device does not control additional functions or capabilities. Note: Computer terminals and peripherals that are intended to be connected to a computer are digital devices.

7.2.2 ICES-003 – Definitions

Information technology equipment (ITE)	Information Technology Equipment (ITE) is defined as devices or systems that use digital techniques for purposes such as data processing and computation. ITE is any unintentional radiator (device or system) that generates and/or uses timing signals or pulses having a rate of at least 9 kHz and employs digital techniques for purposes such as computation, display, data processing and storage, and control.

Section 8 Testing data

8.1 Radiated emissions

8.1.1 References and limits

- FCC 47 CFR Part 15, Subpart B: Clause §15.109 (Test method ANSI C63.4:2014)
- ICES-003: Section 6.2

Table 8.1-1: *Requirements as per FCC Part 15 Subpart B and ICES-003 for radiated emissions for Class A*

Frequency range [MHz]	Measurement		limits
	Distance [m]	**Detector type/ bandwidth**	**[dBµV/m]**
30–88 88–216 216–960 960–1000	10	Quasi Peak/120 kHz	39.0 43.5 46.4 49.5
30–88 88–216 216–960 960–1000	3	Quasi Peak/120 kHz	49.5 54.0 56.9 60.0
>1000	10	Linear average/1 MHz Peak/1 MHz	49.5 69.5
>1000	3	Linear average/1 MHz Peak/1 MHz	60.0 80.0

Notes: Where there is a step in the relevant limit, the lower value was applied at the transition frequency.

8.1.2 Test summary

Verdict	Pass		
Test date	February 4, 2019	Temperature	25.4 °C
Test engineer	Daniel Hynes	Air pressure	1011.0 mbar
Test location	Montreal	Relative humidity	34.2 %

8.1.3 Notes

- Where tabular data has not been provided, no emissions were observed within 10 dB of the specified limit when measured with the appropriate detector.
- Where less than 6 measurements per detector has been provided, fewer than 6 emissions were observed within 10 dB of the specified limit when measured with the appropriate detector.
- The highest digital operating frequency of the EUT as provided by the client was 20 MHz. The spectrum was scanned to 1 GHz according to the EUT highest digital operating frequency.

Table 8.1-2: *Frequency range for FCC Part 15 Subpart B and ICES-003 Issue 6*

Highest internal frequency [F_X]	Highest measured frequency
$F_X \leq 108$ MHz	1 GHz
108 MHz < $F_X \leq 500$ MHz	2 GHz
500 MHz < $F_X \leq 1$ GHz	5 GHz
$F_X > 1$ GHz	5 × F_X up to a maximum of 40 GHz

Notes: Highest internal frequency [F_X] – highest fundamental frequency generated or used within the EUT or highest frequency at which it operates. This includes frequencies which are solely used within an integrated circuit.
For FM and TV broadcast receivers F_X is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

8.1.4 Setup details

Port under test	Enclosure Port
EUT power input during test	120 V_{AC}, 60 Hz
EUT setup configuration	Table top
Test facility	Semi anechoic chamber
Measuring distance	3 m
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 10 dB or above the 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 (Peak preview measurement), 100 ms (Quasi-peak final measurement)

Receiver/spectrum analyzer settings for frequencies above 1 GHz:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	Peak (Preview measurement) Peak and CAverage (Final measurement)
Trace mode	Max Hold
Measurement time	100 ms (Peak preview measurement), 100 ms (Peak and CAverage final measurement)

***Table 8.1-3:** Radiated emissions equipment list*

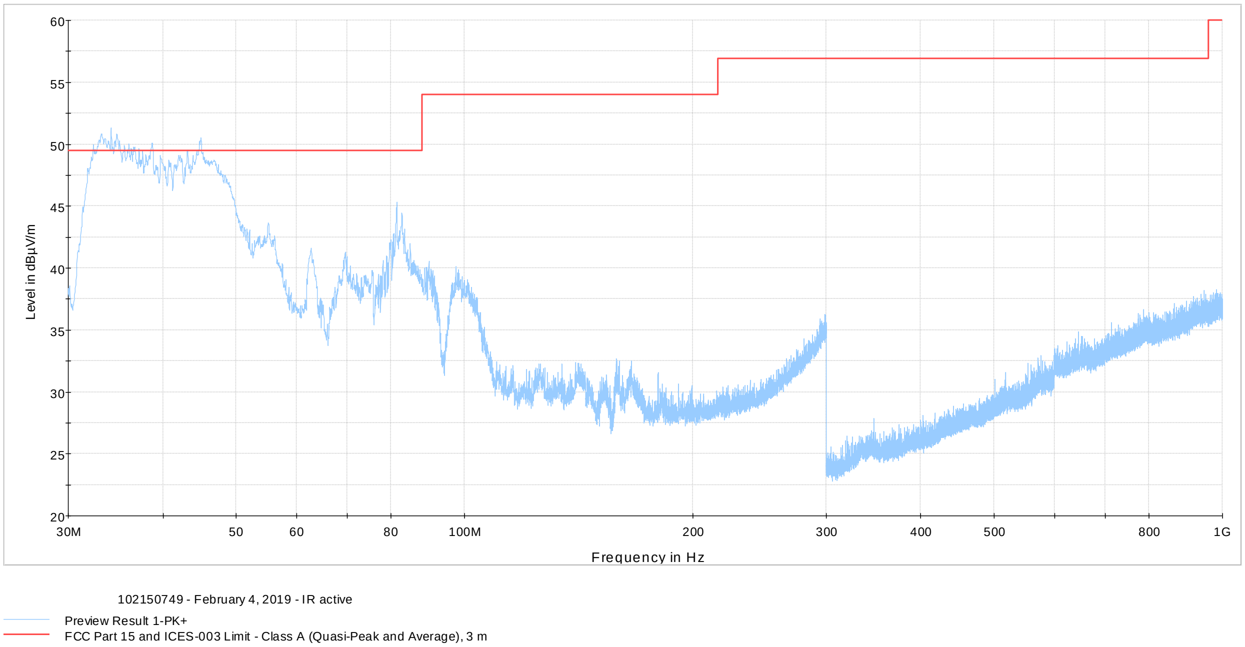
Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002532	2 year	Jan. 10/20
Flush mount turntable	Sunol	FM2022	FA002550	—	NCR
Controller	Sunol	SC104V	FA002551	—	NCR
Antenna mast	Sunol	TLT2	FA002552	—	NCR
3 Phase AC Power Source	apc AC Power	45 kVA	FA002677	—	VOU
Power Meter	HIOKI	PW3337	FA002727	1 year	Aug. 8/19
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 40	FA002071	1 year	Dec. 6/19
Biconical antenna (30–300 MHz)	Sunol	BC2	FA002078	1 year	Oct. 5/19
Log periodic antenna (200–5000 MHz)	Sunol	LP5	FA002077	1 year	Oct. 5/19

Notes: NCR - no calibration required
VOU - verify on use

***Table 8.1-4:** Radiated emissions test software details*

Manufacturer of Software	Details
Rohde & Schwarz	EMC32, Software for EMC Measurements, Version 9.26.01

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 emissions spectral plot (30 to 1000 MHz)*

8.1.5 Test data, continued

Table 8.1-5: *Radiated emissions (Quasi-Peak) results*

Frequency (MHz)	Quasi-Peak field strength[1] (dBµV/m)	3 m Quasi-Peak limit [3] (dBµV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor[2] (dB)
33.21	44.9	49.5	4.7	100	120	100	V	346	15.7
44.88	44.7	49.5	4.8	100	120	106	V	194	13.7
48.30	44.3	49.5	5.2	100	120	104	V	195	13.5
34.80	44.1	49.5	5.4	100	120	100	V	314	15.3
34.14	43.8	49.5	5.7	100	120	112	V	346	15.4
36.06	43.6	49.5	5.9	100	120	102	V	325	15.0
43.11	43.3	49.5	6.2	100	120	103	V	262	13.8
46.71	43.2	49.5	6.4	100	120	105	V	228	13.6
32.40	42.8	49.5	6.7	100	120	125	V	350	15.9
37.20	42.5	49.5	7.0	100	120	105	V	11	14.8
40.74	42.0	49.5	7.5	100	120	102	V	250	14.1
38.73	41.9	49.5	7.6	100	120	115	V	339	14.4
39.66	41.4	49.5	8.1	100	120	102	V	249	14.3
31.83	41.2	49.5	8.4	100	120	122	V	355	16.0
41.94	40.9	49.5	8.6	100	120	102	V	7	13.9
52.05	39.2	49.5	10.3	100	120	104	V	224	13.5
55.08	37.5	49.5	12.0	100	120	106	V	190	13.6
56.16	37.1	49.5	12.4	100	120	112	V	155	13.6
82.65	36.0	49.5	13.5	100	120	110	V	28	14.8
57.51	35.6	49.5	13.9	100	120	136	V	259	13.7
69.66	35.5	49.5	14.0	100	120	108	V	343	14.2
83.37	35.4	49.5	14.1	100	120	100	V	127	14.9
69.99	35.3	49.5	14.2	100	120	111	V	316	14.2
70.71	35.2	49.5	14.3	100	120	107	V	30	14.2
80.61	35.1	49.5	14.5	100	120	106	V	101	14.8
69.24	34.9	49.5	14.6	100	120	103	V	30	14.1
53.64	34.9	49.5	14.6	100	120	108	V	177	13.5
79.95	34.1	49.5	15.4	100	120	105	V	342	14.8
84.75	33.6	49.5	15.9	100	120	103	V	114	14.9
78.87	32.8	49.5	16.7	100	120	104	V	94	14.7
85.74	32.8	49.5	16.7	100	120	106	V	111	14.9
75.51	31.9	49.5	17.6	100	120	108	V	47	14.6
78.06	31.8	49.5	17.7	100	120	112	V	94	14.7
81.48	31.7	49.5	17.8	100	120	133	V	352	14.7
89.76	35.6	54.0	18.4	100	120	102	V	139	15.1
98.10	34.0	54.0	20.0	100	120	114	V	60	15.5

Notes: [1] Field strength (dBµV/m) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

[2] Correction factor = antenna factor ACF (dB) + cable loss (dB)

[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Sample calculation: 25.0 dBµV/m (field strength) = 15.5 dBµV (receiver reading) + 9.5 dB (Correction factor)

8.1.6 Setup photos

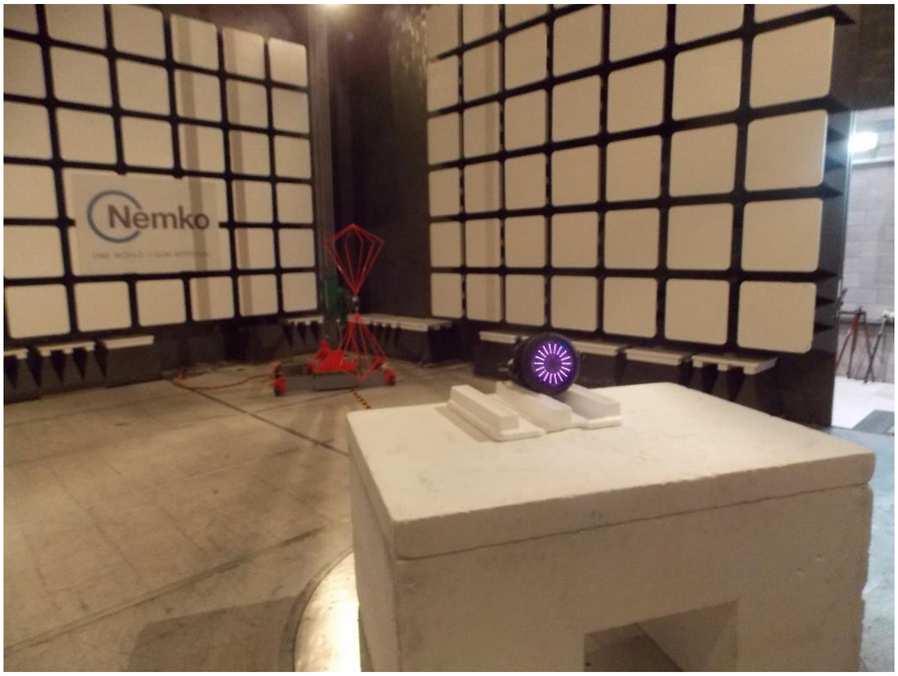


Figure 8.1-2: *Radiated emissions setup photo – below 1 GHz*

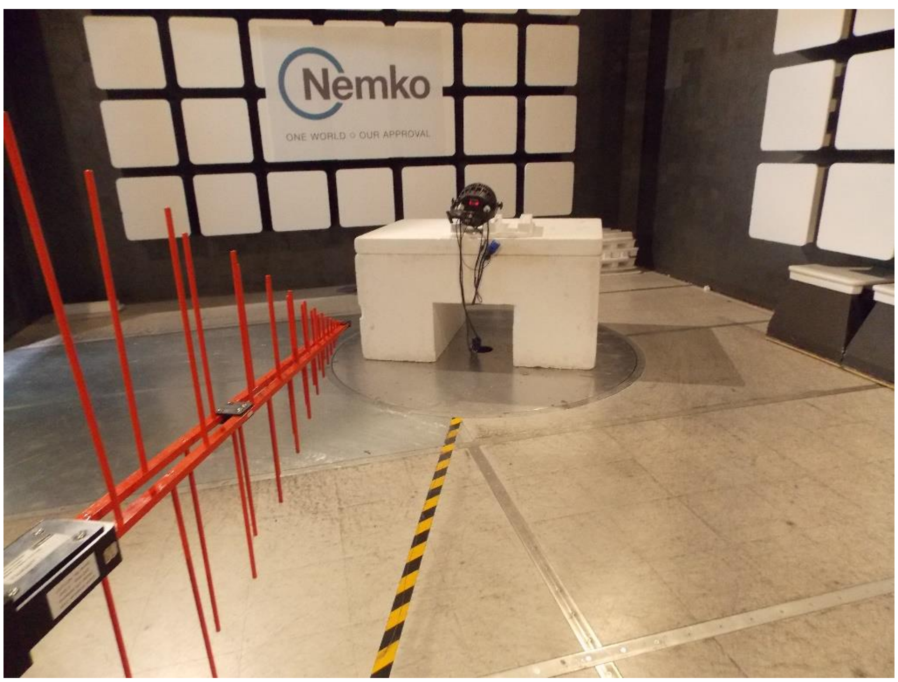


Figure 8.1-3: *Radiated emissions setup photo – below 1 GHz*

8.2 Conducted emissions – from AC mains power ports

8.2.1 References and limits

- FCC 47 CFR Part 15, Subpart B: Clause §15.107 (Test method ANSI C63.4:2014)
- ICES-003: Section 6.1

Table 8.2-1: *Requirements for conducted emissions from the AC mains power ports for Class A*

Frequency range [MHz]	Measurement		Limits
	Coupling device	Detector type/ bandwidth	[dBµV]
0.15–0.5	AMN	Quasi Peak/9 kHz	79
0.5–30			73
0.15–0.5	AMN	CAverage/9 kHz	66
0.5–30			60

Notes: The lower limit shall apply at the transition frequency.

8.2.2 Test summary

Verdict	Pass		
Test date	February 4, 2019	Temperature	25.4 °C
Test engineer	Daniel Hynes	Air pressure	1011.0 mbar
Test location	Montreal	Relative humidity	34.2 %

8.2.3 Notes

- Where tabular data has not been provided, no emissions were observed within 10 dB of the specified limit when measured with the appropriate detector.
- Where less than 6 measurements per detector has been provided, fewer than 6 emissions were observed within 10 dB of the specified limit when measured with the appropriate detector.
- Equipment with a DC power port powered by a dedicated AC/DC power converter is considered to be AC mains powered equipment and was tested with a power converter. Where the power converter was provided by the manufacturer, the provided converter was used.

8.2.4 Setup details

Port under test – Coupling device	AC Mains Input – Artificial Mains Network (AMN)
EUT power input during test	120 V_{AC}, 60 Hz
EUT setup configuration	Table top
Measurement details	A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 10 dB or above the 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 CAverage (Final measurement)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak and Average preview measurement) – 160 ms (Quasi-peak final measurement) – 160 ms (CAverage final measurement)

Table 8.2-2: *Conducted emissions – from AC mains power ports equipment list*

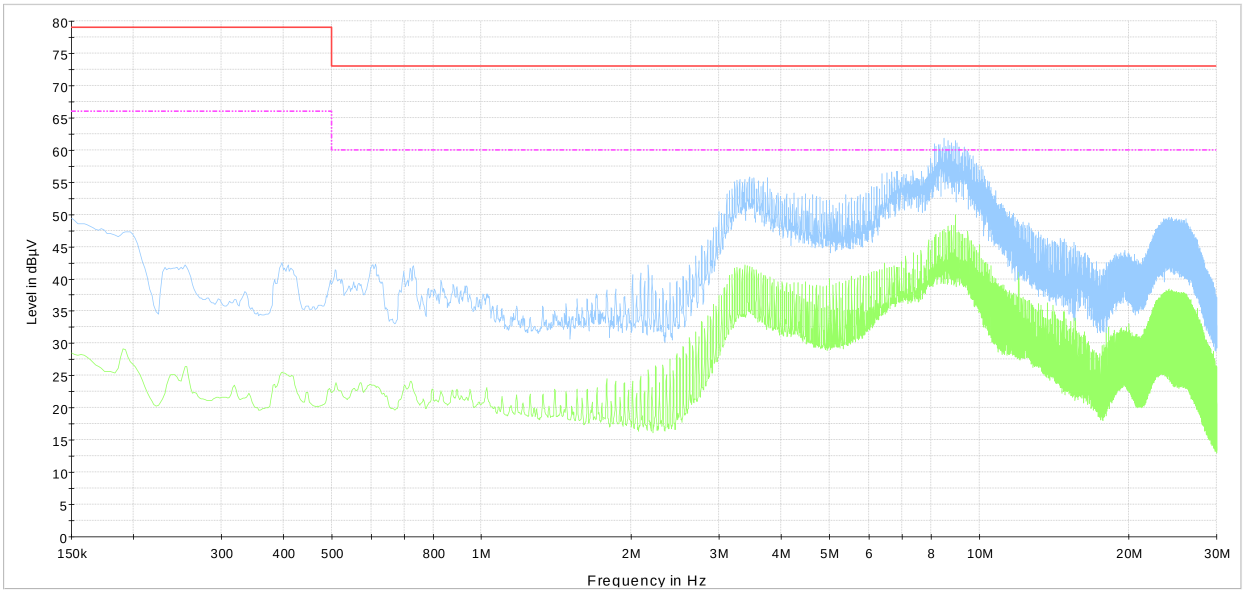
Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 40	FA002071	1 year	Dec. 6/19
3 Phase AC Power Source	apc AC Power	45 kVA	FA002677	—	VOU
Power Meter	HIOKI	PW3337	FA002727	1 year	Aug. 8/19
Four Line V-Network	TESEQ	NNB52	FA002339	1 year	Nov. 29/19

Notes: VOU - verify on use

Table 8.2-3: *Conducted emissions – from AC mains power ports test software details*

Manufacturer of Software	Details
Rohde & Schwarz	EMC32, Software for EMC Measurements, Version 9.26.01

8.2.5 Test data

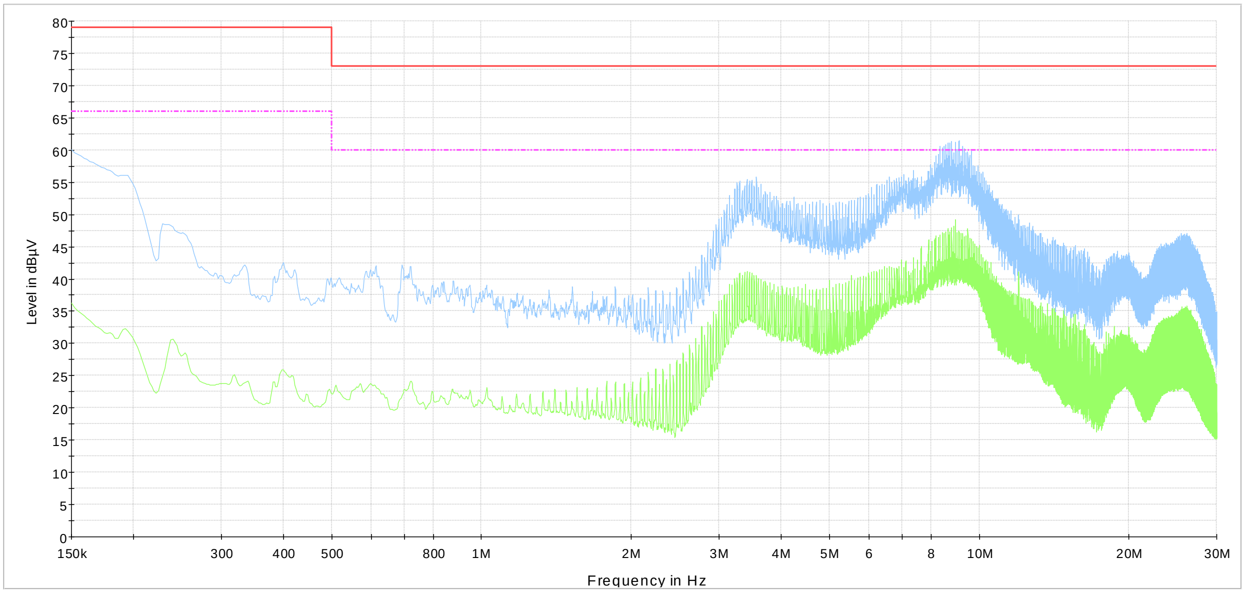


102150749 - February 4, 2019 - 120 VAC, 60 Hz - Phase
Preview Result 2-AVG
Preview Result 1-PK+
CISPR 32 Limit - Class A, Mains (Quasi-Peak)
CISPR 32 Limit - Class A, Mains (Average)

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

Figure 8.2-1: *Conducted emissions – from AC mains power ports spectral plot on phase line*

8.2.5 Test data, continued



102150749 - February 4, 2019 - 120 VAC, 60 Hz - Neutral
Preview Result 2-AVG
Preview Result 1-PK+
CISPR 32 Limit - Class A, Mains (Quasi-Peak)
CISPR 32 Limit - Class A, Mains (Average)

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

Figure 8.2-2: *Conducted emissions – from AC mains power ports spectral plot on neutral line*

8.2.6 Setup photos

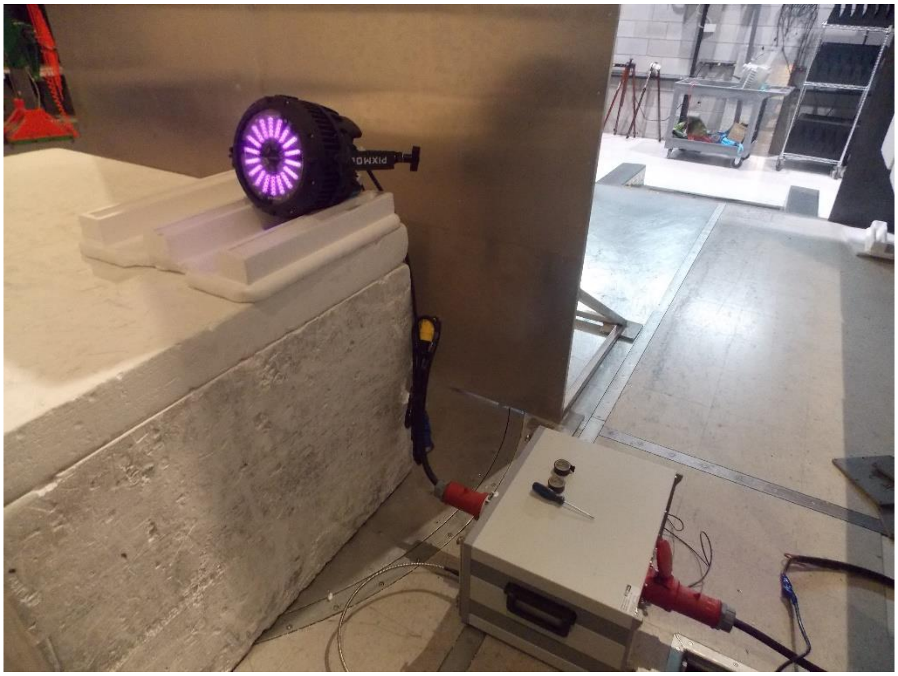


Figure 8.2-3: *Conducted emissions – from AC mains power ports setup photo*

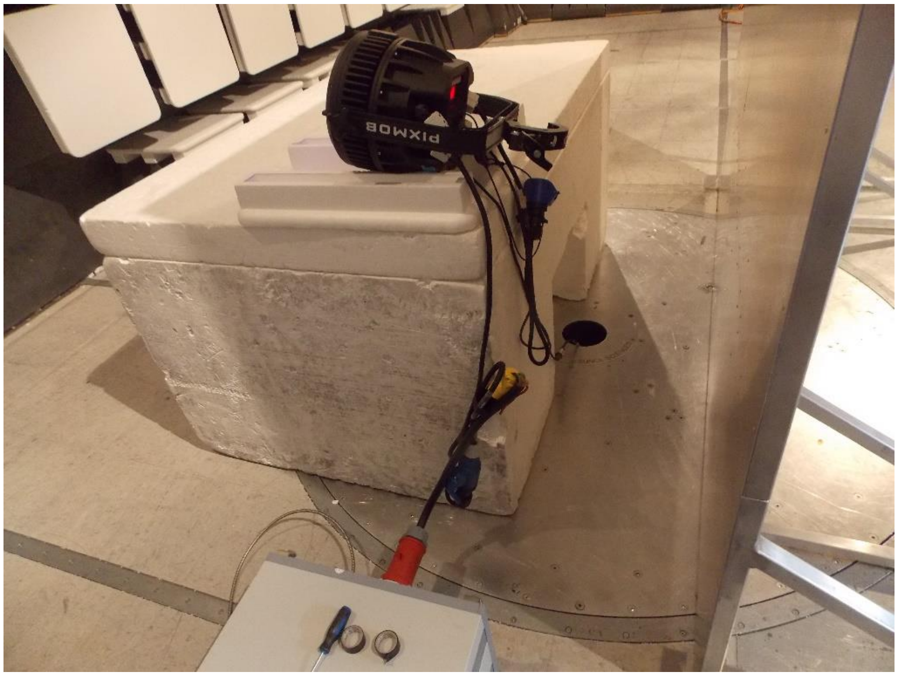


Figure 8.2-4: *Conducted emissions – from AC mains power ports setup photo*

Section 9 EUT photos

9.1 External photos

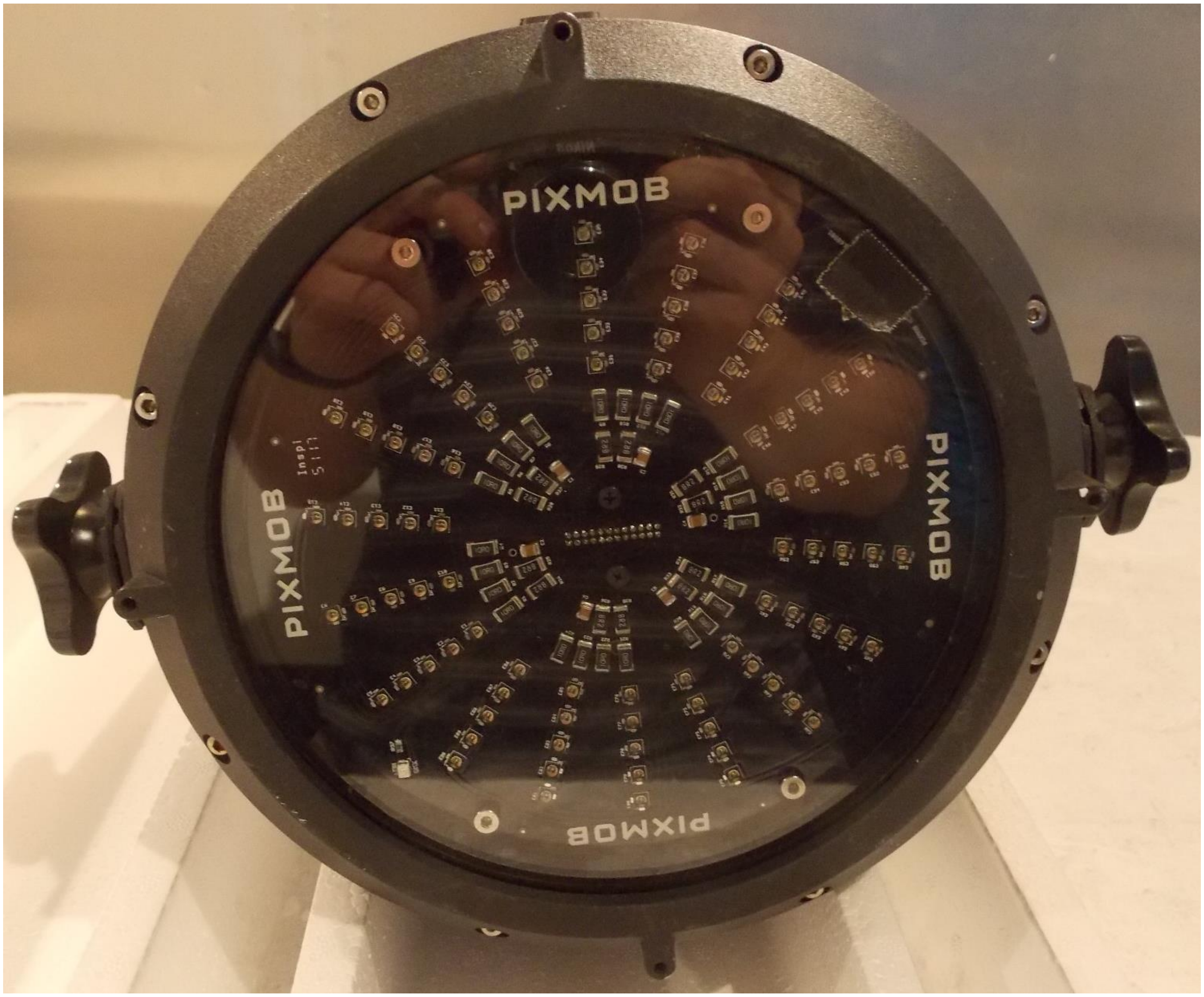


Figure 9.1-1: *Front view photo*

Figure 9.1-2: *Rear view photo*

Figure 9.1-3: *Side view photo*

Figure 9.1-4: *Side view photo*

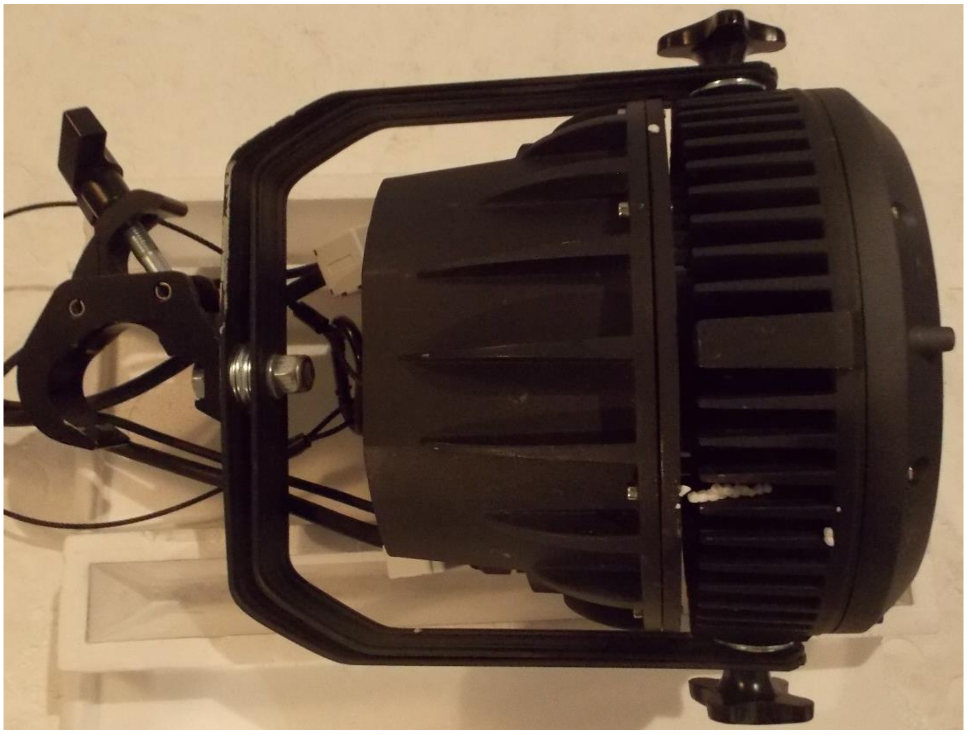


Figure 9.1-5: *Top view photo*

Figure 9.1-6: *Bottom view photo*

9.2 Internal photos

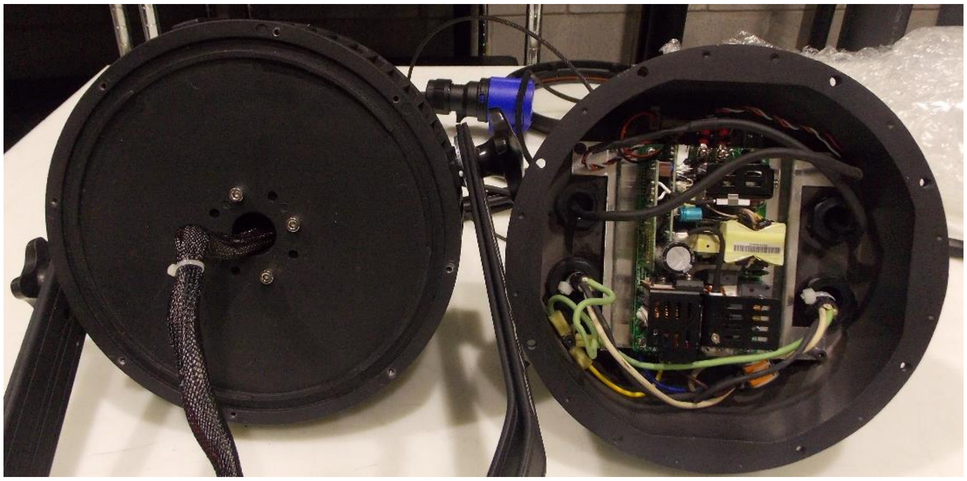


Figure 9.2-1: *Internal assembly view photo*

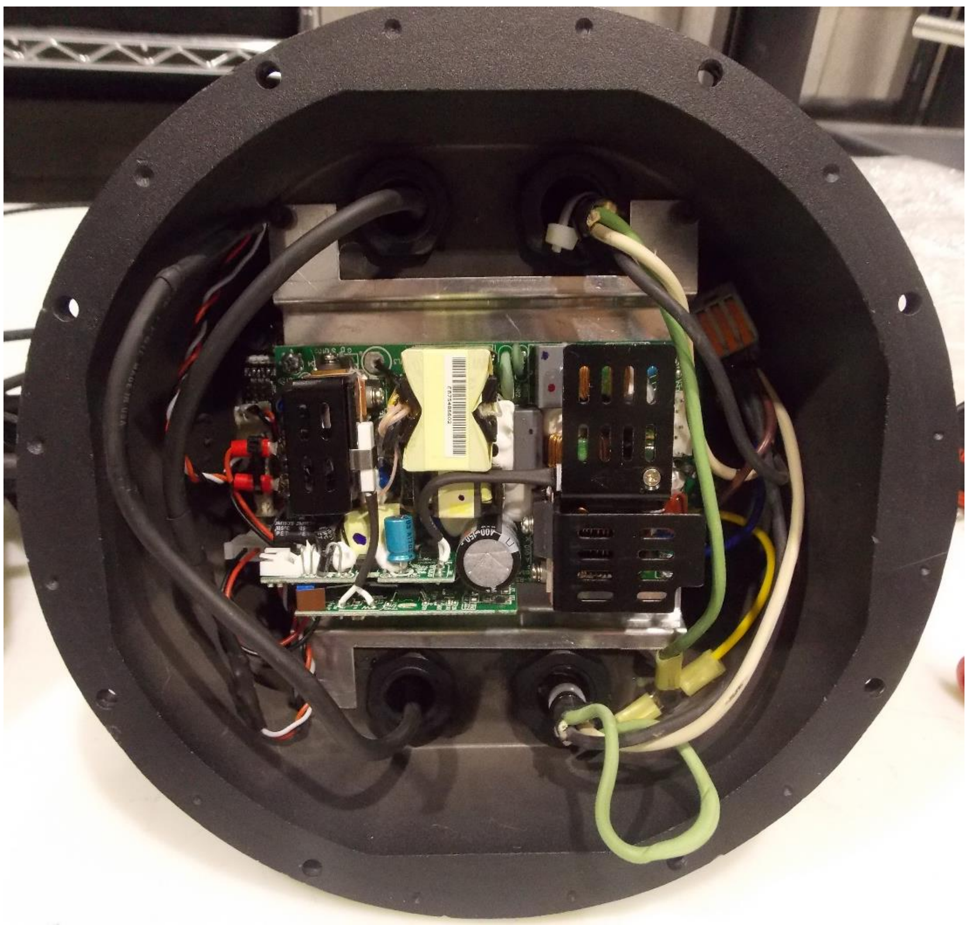


Figure 9.2-2: *Internal assembly view photo*

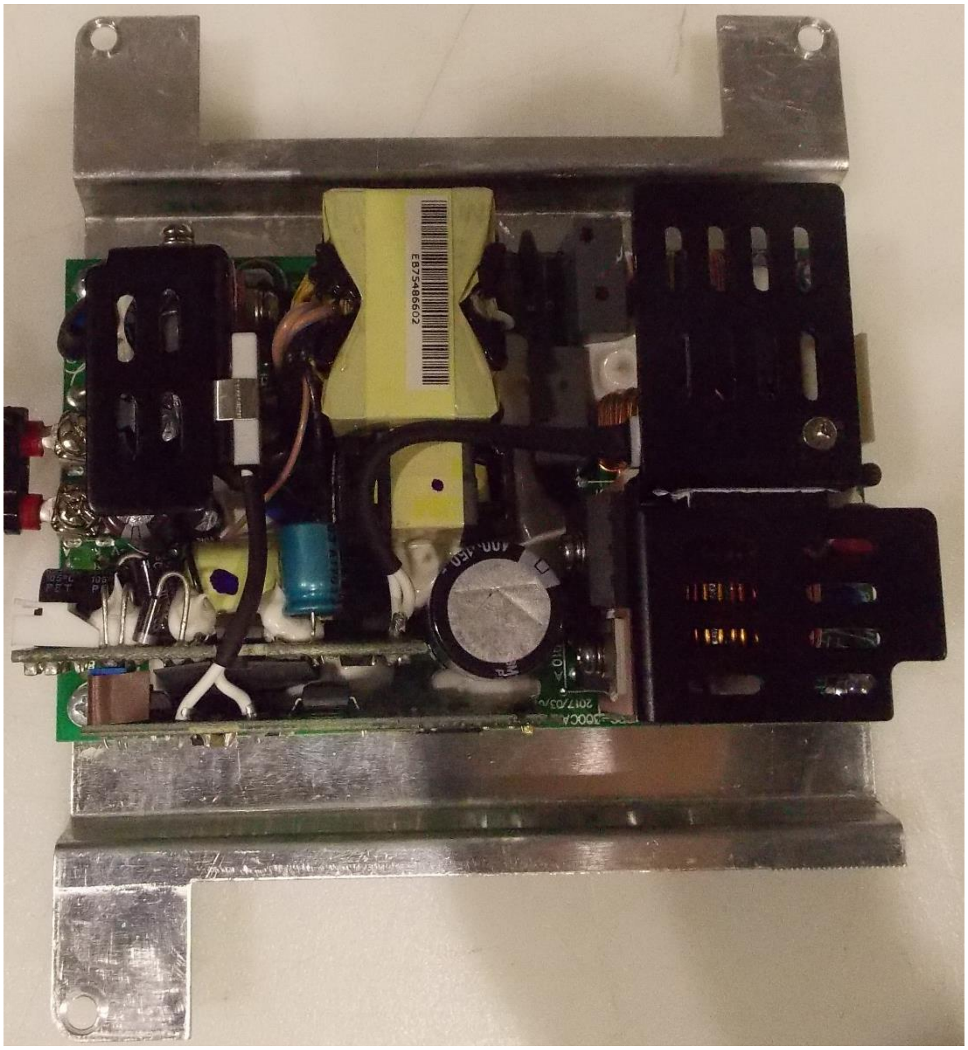


Figure 9.2-3: *Power supply view photo*

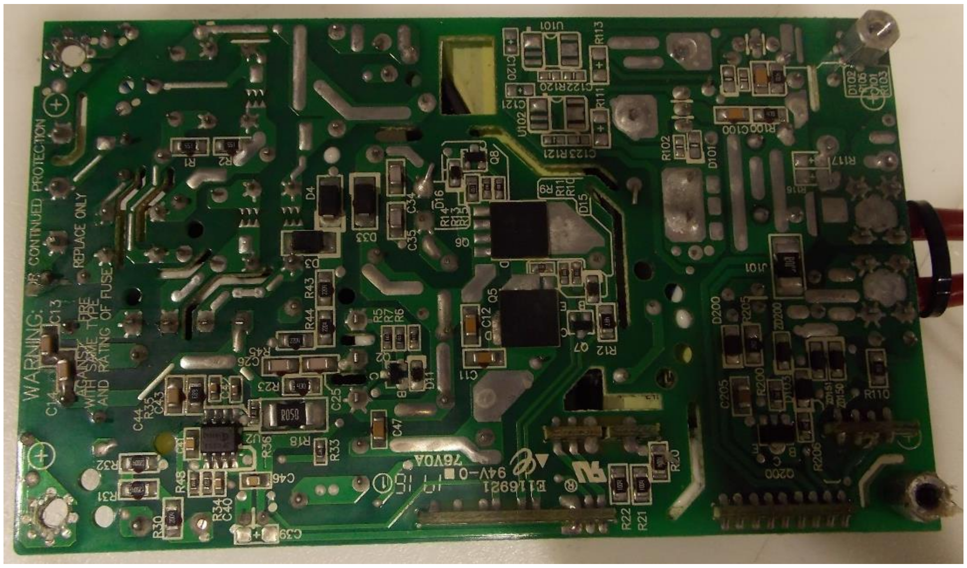


Figure 9.2-4: *Power supply view photo*

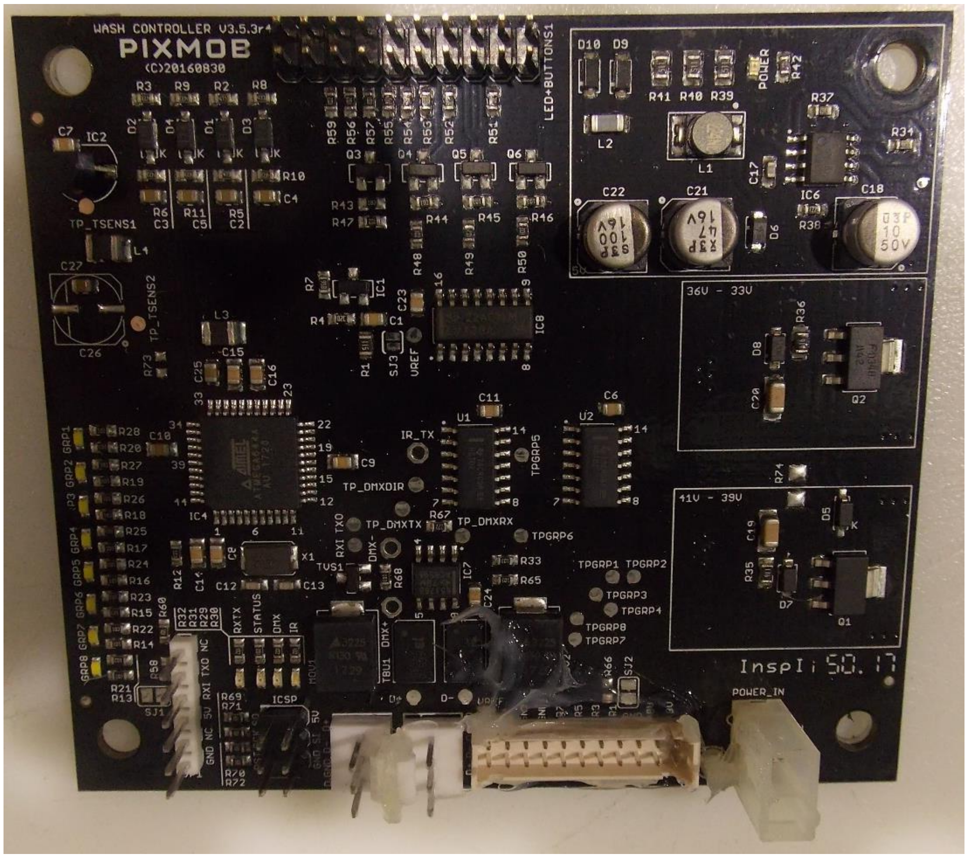


Figure 9.2-5: *Controller board view photo*

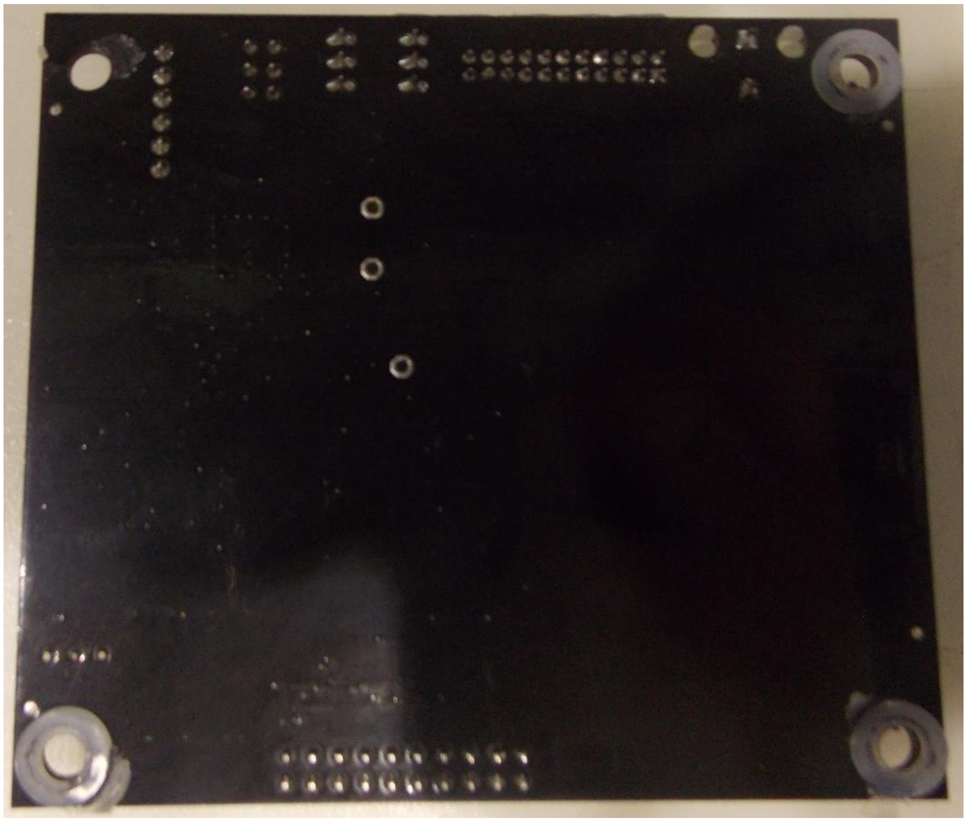


Figure 9.2-6: *Controller board view photo*

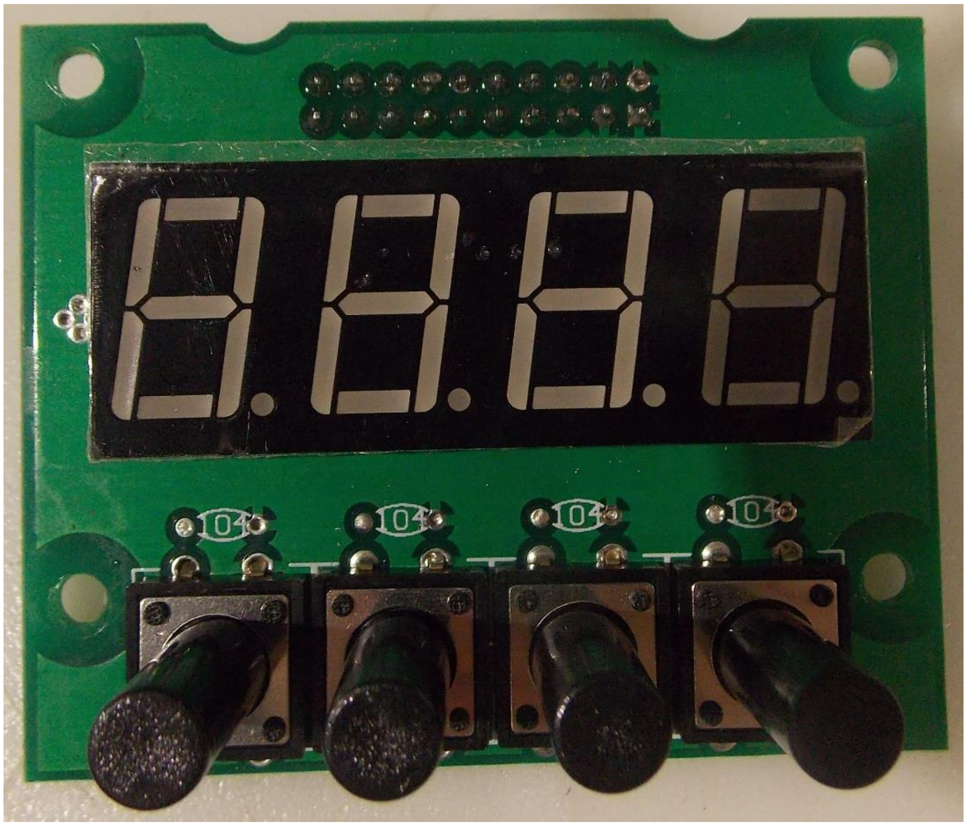


Figure 9.2-7: *Display board view photo*

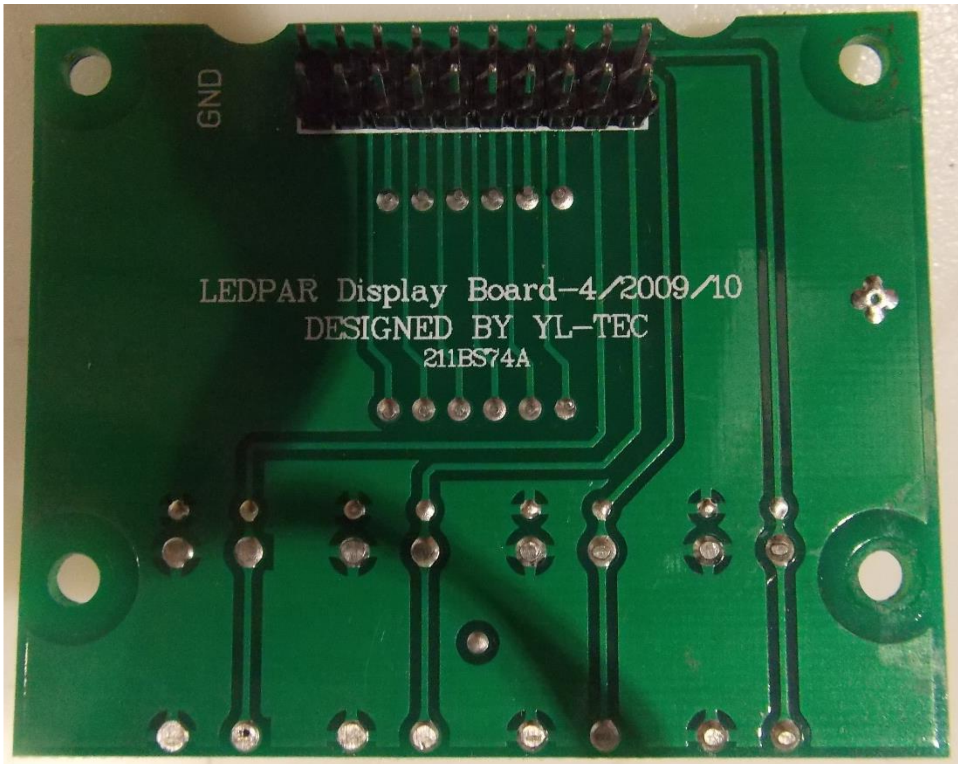


Figure 9.2-8: *Display board view photo*

9.3 Product label

Figure 9.3-1: *Product label view photo*

End of the test report