



EMC Technologies (NZ) Ltd
47 Mackelvie St, Grey Lynn
Auckland 1035
New Zealand
Phone 09 360 0862
E-Mail Address: aucklab@emctech.co.nz
Web Site: www.emctech.co.nz

TEST REPORT

Invenco G6-500NFC NFC Radio Transmitter

tested to the specification

47 Code of Federal Regulations

Part 15 - Radio Frequency Devices

Subpart C – Intentional Radiators

Section 15.225

Operation within the band 13.110 -14.010 MHz

for

Invenco Group Ltd

A handwritten signature in black ink, appearing to read "Andrew Cutler".

This test report is issued with the authority of:

Andrew Cutler - General Manager



Table of Contents

1. STATEMENT OF COMPLIANCE	3
2. RESULTS SUMMARY	3
3. INTRODUCTION	4
4. CLIENT INFORMATION	4
5. DESCRIPTION OF TEST SAMPLE	5
6. SETUPS AND PROCEDURES	6
7. TEST EQUIPMENT USED	18
8. ACCREDITATIONS	18
9. PHOTOGRAPHS	19

1. STATEMENT OF COMPLIANCE

The **Invenco G6-500NFC NFC Radio Transmitter** complies with FCC Part 15 Subpart C Section 15.225 as an Intentional Radiator when the methods as described in ANSI C63.10 – 2013 are applied.

2. RESULTS SUMMARY

The results from testing carried out in September 2023 and in December 2025 are detailed in the following table:

Clause	Parameter	Result
15.201	Equipment authorisation requirement	Certification required
15.203	Antenna requirement	Complies. Antenna internal to the device
15.204	External PA and antenna modifications	Not applicable. No external devices
15.205	Restricted bands of operation	Complies. Device transmits on a nominal frequency of 13.560 MHz
15.207	Conducted limits	Complies
15.209	Radiated emission limits - Emissions < 30 MHz	Complies
15.209	Radiated emission limits – Emissions > 30 MHz	Complies
15.225	Radiated emission limits - Fundamental	Complies
15.225	Frequency stability	Complies

3. INTRODUCTION

This report describes the tests and measurements performed for the purpose of determining compliance with the specification.

The client selected the test sample.

This report relates only to the sample tested.

This report contains no corrections or erasures.

Measurement uncertainties with statistical confidence intervals of 95% are shown below test results. Both Class A and Class B uncertainties have been accounted for, as well as influence uncertainties where appropriate.

All compliance statements have been made with respect of the specification limit with no reference to the measurement uncertainty.

All testing was carried out as per the standard in the worst-case configuration with no deviations being applied.

Version	Change Made	Date
251004.10	Initial Issue	19 th March 2026

4. CLIENT INFORMATION

Company Name	Invenco Group Ltd
Address	7-11 Kawana Street, Northcote, 0627
City	Auckland
Country	New Zealand
Contact	Mr Chris Henry

5. DESCRIPTION OF TEST SAMPLE

Brand Name	Invenco
Model Tested	G6-500NFC
Product	NFC Radio Transmitter
Manufacturer	Invenco Group Ltd
Country of Origin	New Zealand
Serial Number	U8LH001R
FCC ID	2AC7B-G6500NFC

Testing was carried out on the NFC radio transmitter that was installed in an I2-05 (G6-500) Indoor Payment Terminal which was connected to an auxiliary ethernet switch.

When configured as an Indoor Terminal a physical cradle to support desktop operations is added along with a cable assembly.

A USB Flash Drive was loaded into one of the USB ports on the device.

The USB Flash Drive contained the test software script for running the test loop.

The test loop was operating during testing to fully exercise the device.

The test loop activated the ICC, NFC, Barcode Reader and Tamper Checks in a continuous loop.

The radio transmitter comprises a NFC card reader that operated on 13.560 MHz.

The original radio testing was carried out in 2023 as a complete device (FCC ID: 2AC7B-G6500).

Due to modifications to the product retesting was carried out in December 2025.

The client has requested that modular certification be sought for the NFC transmitter based upon the testing carried out in 2023 and 2025.

6. SETUPS AND PROCEDURES

Standard

The sample was tested in accordance with 47 CFR Part 15 Subpart C.

Methods and Procedures

The measurement methods and procedures as described in ANSI C63.10 – 2013 were used.

Section 15.201: Equipment authorisation requirement

Certification as detailed in Subpart J of Part 2 is required for this device.

Section 15.203: Antenna requirement

The device has a permanently attached internal 13.560 MHz antenna.

Result: Complies.

Section 15.204: External radio frequency power amplifiers and antenna modifications

It is NOT possible to attach an external power amplifier to this transmitter.

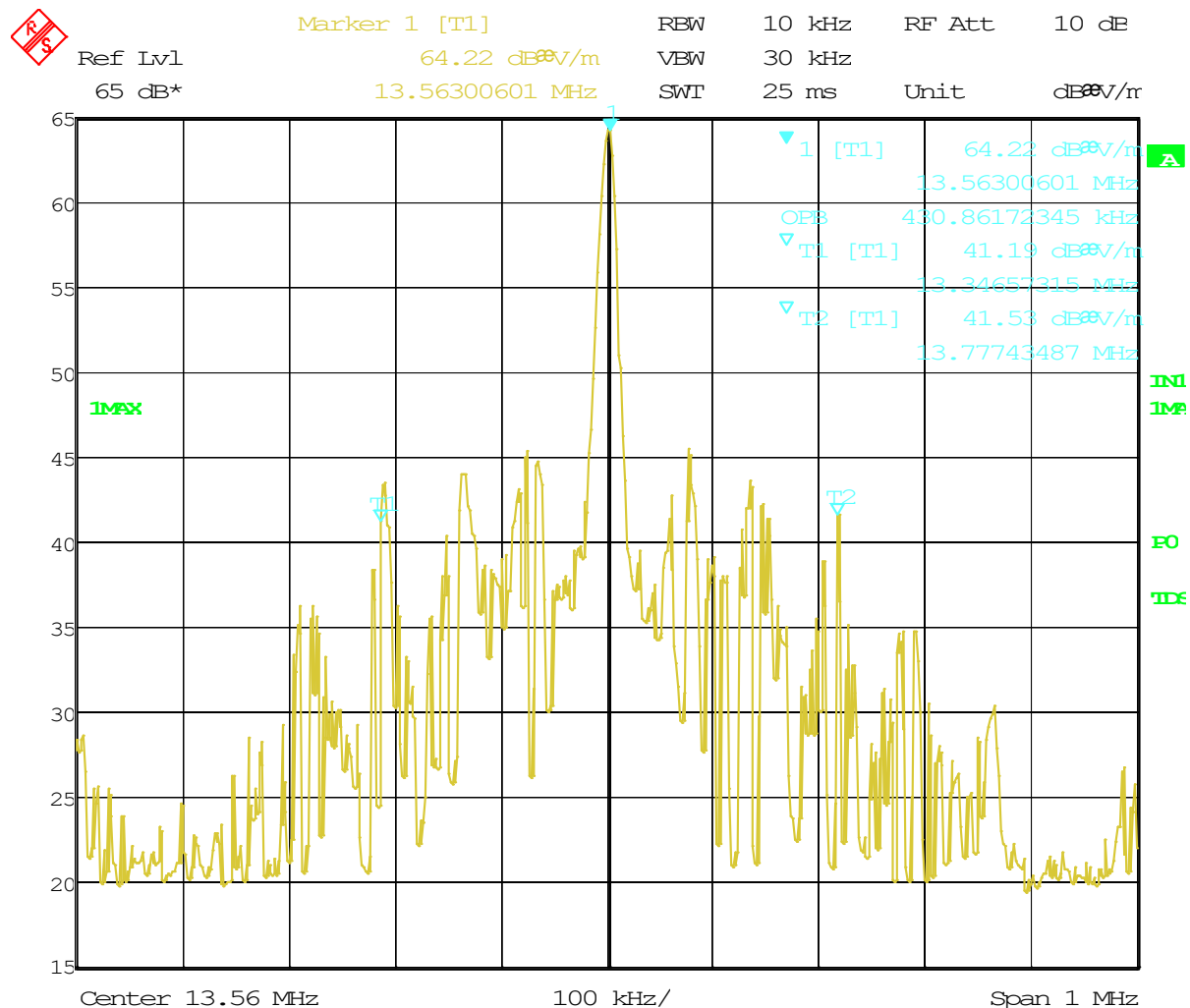
Result: Complies.

Section 15.205: Restricted bands of operation

The device transmits on a nominal frequency of 13.560 MHz.

13.560 MHz transmissions would fall into the 13.110 – 14.010 MHz band that is covered by Section 15.225.

Below is a plot of the device transmitting on 13.560 MHz with a 99% occupied power bandwidth of 430.8617 kHz.



Date: 30.AUG.2023 13:55:03

Result: Complies.

Conducted emissions testing

Conducted Emissions testing was carried out over the frequency range of 150 kHz to 30 MHz which was carried out at the laboratory's MacKelvie Street premises in a 2.4 m x 2.4 m x 2.4 m screened room

As it is possible for this device to be directly or indirectly connected to the Public AC mains supply testing was carried out using a representative AC power supply system that was powered at 120 Vac 60 Hz which supplied DC to the device under test.

Testing was carried out while the NFC Card Reader was active transmitting on 13.560 MHz.

Initial testing was carried out when the NFC Card Reader was operating normally with the internal antenna connected.

A second test was then carried out with the NFC Card Reader was de-activated.

The device is deemed to comply providing if the deactivated test complies and the overall emission signature for the product remains similar in both test configurations with no additional emissions being detected.

The device was placed on top of the emissions table, which is 0.8 m x 0.8 m, 80 cm above the screened room floor which acts as the horizontal ground plane.

In addition the device was positioned 40 cm away from the screened room wall which acts as the vertical ground plane.

The artificial mains network was bonded to the screened room floor.

At all times the device was kept more than 80 cm from the artificial mains network.

The supplied plot is combined plot showing the worst case quasi peak and average results of both the phase and neutral lines to the representative AC power supply.

Quasi peak and average detectors have been used with resolution bandwidths of 9 kHz.

Result: Complies

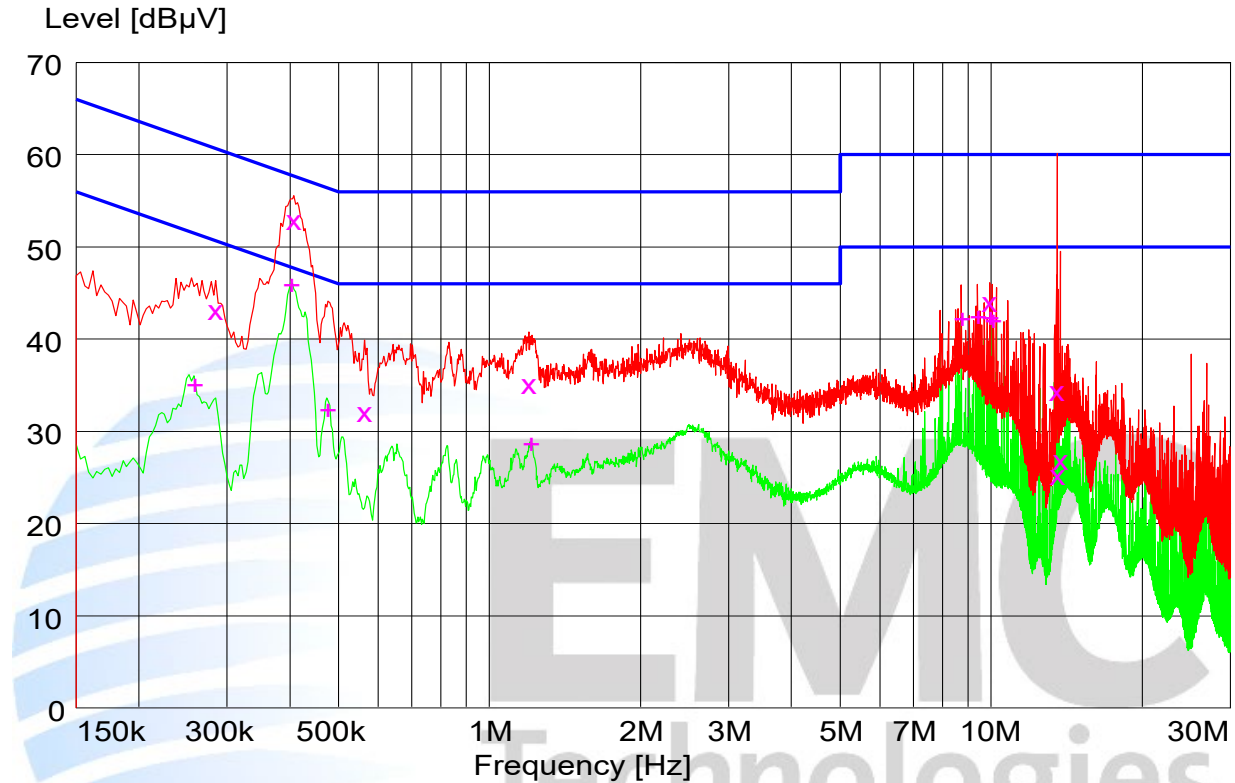
Measurement uncertainty with a confidence interval of 95% is:

- AC Mains port (0.15-30 MHz) ± 2.8 dB

Conducted Emissions – AC Input Power Port – NFC ON

Setup:	G6 500 IPT powered from 120 VAC supply, from the AC adapter. Ethernet connected to ethernet hub. USB port loaded with flash drive containing test script. System running continuous test script loop. NFC ON; Barcode reader active; ICC Card reader active; Security Tamper active.
---------------	--

Peak ---
Average --
Quasi Peak X
Average +



Final Quasi-Peak Measurements

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Phase	Rechecks (dBμV)
0.285000	43.50	60.7	17.2	L1	53.0
0.408000	53.20	57.8	4.5	L1	
0.564000	32.40	56.0	23.6	N	
1.197000	35.40	56.0	20.6	L1	34.7
9.938000	44.30	60.0	15.7	L1	
13.529000	34.70	60.0	25.3	L1	
13.560500	25.50	60.0	34.5	L1	66.0 (NFC)
13.767500	27.20	60.0	32.8	N	28.9

NFC Harmonic Manual measurements: 27.12 MHz = 46.9 dB (QP)

Final Average Measurements

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Phase	Rechecks (dBμV)
0.258000	35.30	51.5	16.2	L1	45.8
0.402000	46.20	47.8	1.6	L1	
0.474000	32.60	46.4	13.8	L1	
1.206000	28.90	46.0	17.1	L1	7.4
8.718500	42.50	50.0	7.5	L1	
9.389000	42.70	50.0	7.3	L1	
9.938000	42.60	50.0	7.4	L1	7.7
10.059500	42.30	50.0	7.7	L1	

NFC Manual measurements: 13.56 MHz = 35.8 dB (Av)

NFC Manual measurements: 27.12 MHz = 20.9 dB (Av)

Conducted Emissions – AC Input Power Port – NFC OFF

Setup:	G6 500 IPT powered from 120 VAC supply, from the AC adapter. Ethernet connected to ethernet hub USB port loaded with flash drive containing test script. System running continuous test script loop. NFC OFF; Barcode reader active; ICC Card reader active; Security Tamper active.
---------------	--

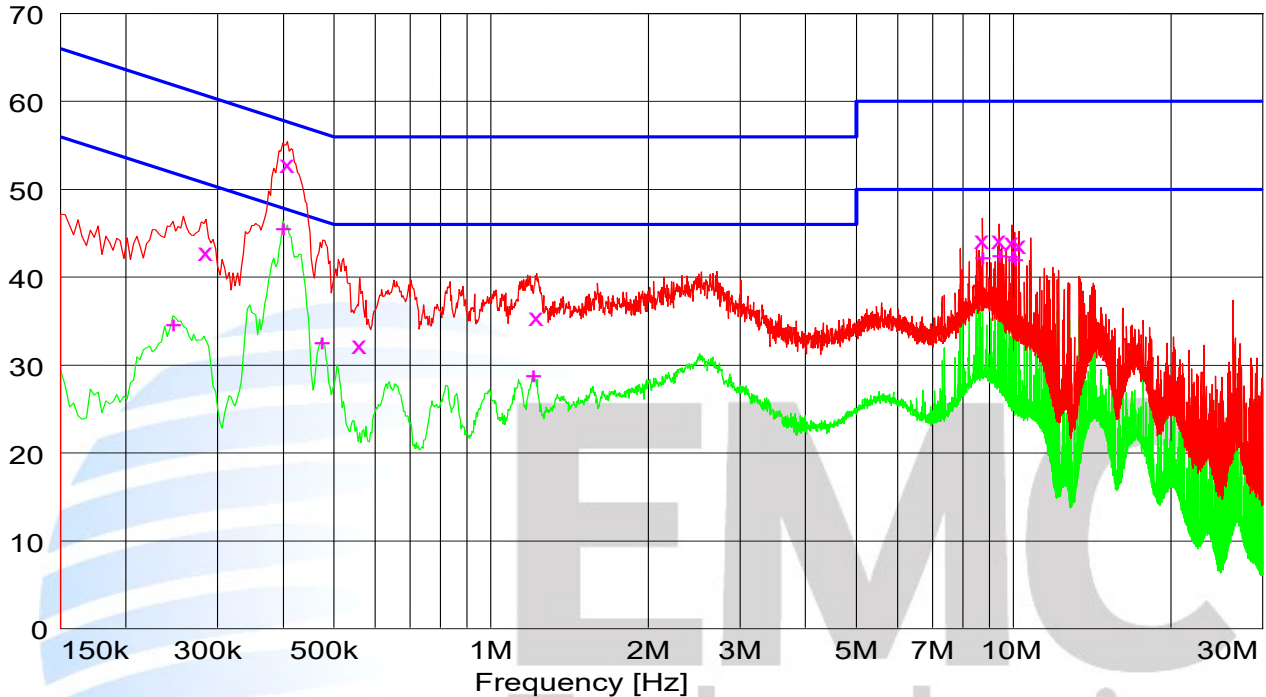
Peak ---

Average --

Quasi Peak X

Average +

Level [dBμV]



Final Quasi-Peak Measurements

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Phase	Rechecks (dBμV)
0.285000	43.10	60.7	17.6	L1	-
0.408000	53.10	57.7	4.6	L1	52.6
0.561000	32.50	56.0	23.5	N	-
1.224000	35.70	56.0	20.3	L1	-
8.718500	44.40	60.0	15.6	L1	-
9.389000	44.50	60.0	15.5	L1	-
9.938000	44.20	60.0	15.8	L1	-
10.244000	43.90	60.0	16.2	L1	-

NFC Manual measurements: 13.56 MHz = 25.2 dB (QP)

NFC Manual measurements: 27.12 MHz = 17.9 dB (QP)

Final Average Measurements

Frequency (MHz)	Level (dBμV)	Limit (dBμV)	Margin (dB)	Phase	Rechecks (dBμV)
0.246000	34.80	51.9	17.1	L1	-
0.399000	45.70	47.9	2.2	L1	45.3
0.474000	32.70	46.4	13.7	L1	-
1.203000	29.00	46.0	17.0	N	-
8.718500	42.40	50.0	7.6	L1	41.9
9.389000	42.60	50.0	7.4	L1	42.1
9.938000	42.50	50.0	7.5	L1	42.0
10.059500	42.20	50.0	7.8	L1	41.6

NFC Manual measurements: 13.56 MHz = 20.6 dB (Av)

NFC Manual measurements: 27.12 MHz = 12.5 dB (Av)

Section 15.209: Radiated emission limits, general requirements

Radiated emission testing was carried out over the frequency range of 150 kHz to 6000 MHz.

Testing was carried out at the laboratory's open area test site - located at 670 Kawakawa-Orere Road, RD5, Papakura, New Zealand.

Before testing was carried out a receiver self-calibration was undertaken along with a check of all cables and programmed antenna factors were carried out.

Testing was carried out using a representative AC power supply at 120 VAC 60 Hz that powered the device under test.

The device tested when placed in the centre of the test table flat 0.8 m above the test site ground plane.

All interconnecting cables were bundled in 40 cm long bundles.

Testing was carried out when the NFC device was transmitting continuously on 13.560 MHz and when the NFC device was in standby.

When an emission is located, it is positively identified and its maximum level is found by rotating the automated turntable, and by varying the antenna height, where appropriate, with an automated antenna tower.

Below 30 MHz a magnetic loop is used with the centre of the loop being 1 metre above the ground with measurements being made using a Quasi Peak detector at a distance of 10 metres.

Above 30 MHz the emission is measured in both vertical and horizontal antenna polarisations at a distance of 3 metres.

Below 1000 MHz a Quasi Peak detector with a 120 kHz bandwidth is used.

Above 1000 MHz an Average detector and a Peak detector with bandwidths of 1 MHz are used.

The emission level was determined in field strength by taking the following into consideration:

$\text{Level (dB}\mu\text{V/m)} = \text{Receiver Reading (dB}\mu\text{V)} + \text{Antenna Factor (dB/m)} + \text{Coax Loss (dB)}$

For example, if an emission of 30 dB μ V was observed at 30 MHz.

$$45.5 \text{ dB}\mu\text{V/m} = 30.0 \text{ dB}\mu\text{V} + 14 \text{ dB/m} + 1.5 \text{ dB}$$

Section 15.209: 13.560 MHz transmitter below 30 MHz spurious emission measurements

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
27.120	15.1	48.6	33.5	Pass

The NFC device was transmitting continuously on 13.560 MHz.

Magnetic loop measurements were made at a distance of 10 metres.

Measurement receiver with a quasi-peak detector with a 9 kHz bandwidth was used.

The 30 metre limit has been scaled by a factor of 40 dB per decade, as per section 15.31 (f) (2).

The limit at 27.120 MHz when measured at 30 metres is 30 uV/m or 29.54 dBuV/m.

Therefore the scaled limit at 10 metres will be 48.6 dBuV/m.

The spurious emission observed does not exceed the level of the fundamental emission.

No other low frequency spurious emissions were detected from the device when measurements were attempted from 10 kHz - 30.0 MHz

Result: Complies.

Measurement uncertainty with a confidence interval of 95% is:

- Free radiation tests (10 kHz – 30 MHz) $\pm$ 4.8 dB

Section 15.209: Spurious Emissions (30 – 6000 MHz)

Measurements between 30 – 6000 MHz have been made at a distance of 3 metres.

The limits as described in Section 15.209 have been applied.

NFC operating continuously (NFC ON)

Frequency (MHz)	Vertical (dBuV/m)	Horizontal (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna	Detector
40.680	28.8	19.3	40.0	11.2	Vertical	Quasi Peak
54.240	29.9	22.8	40.0	10.1	Vertical	Quasi Peak
58.720	27.3	-	40.0	12.7	Vertical	Quasi Peak
64.080	29.8	-	40.0	10.2	Vertical	Quasi Peak
66.320	28.2	-	40.0	11.8	Vertical	Quasi Peak
67.800	27.5	-	40.0	12.5	Vertical	Quasi Peak
68.400	28.1	-	40.0	11.9	Vertical	Quasi Peak
69.760	26.3	-	40.0	13.7	Vertical	Quasi Peak
81.240	28.3	23.6	40.0	11.7	Vertical	Quasi Peak
85.560	-	25.9	40.0	14.1	Horizontal	Quasi Peak
86.640	-	26.5	40.0	13.5	Horizontal	Quasi Peak
87.480	33.3	-	40.0	6.7	Vertical	Quasi Peak
88.000	31.0	-	40.0	9.0	Vertical	Quasi Peak
89.760	31.2	-	43.5	12.3	Vertical	Quasi Peak
92.080	32.0	-	43.5	11.5	Vertical	Quasi Peak
103.080	28.7	-	43.5	14.8	Vertical	Quasi Peak
104.200	29.6	-	43.5	13.9	Vertical	Quasi Peak
108.480	-	21.6	43.5	21.9	Horizontal	Quasi Peak
122.040	-	25.3	43.5	18.2	Horizontal	Quasi Peak
127.080	-	26.2	43.5	17.3	Horizontal	Quasi Peak
139.240	-	26.3	43.5	17.2	Horizontal	Quasi Peak
162.720	-	25.2	43.5	18.3	Horizontal	Quasi Peak
172.040	-	35.7	43.5	7.8	Horizontal	Quasi Peak
176.280	-	27.2	43.5	16.3	Horizontal	Quasi Peak
179.320	-	27.6	43.5	15.9	Horizontal	Quasi Peak
216.960	-	24.7	46.0	21.3	Horizontal	Quasi Peak
244.080	-	27.3	46.0	18.7	Horizontal	Quasi Peak
246.200	22.9	26.8	46.0	19.2	Horizontal	Quasi Peak
288.040	28.6	-	46.0	17.4	Vertical	Quasi Peak
319.520	30.2	30.3	46.0	15.7	Horizontal	Quasi Peak
325.440	27.2	27.8	46.0	18.2	Horizontal	Quasi Peak
336.000	29.0	25.2	46.0	17.0	Vertical	Quasi Peak
344.080	29.6	28.3	46.0	16.4	Vertical	Quasi Peak
352.560	31.2	33.5	46.0	12.5	Horizontal	Quasi Peak
368.640	33.5	30.0	46.0	12.5	Vertical	Quasi Peak
379.680	33.5	33.3	46.0	12.5	Vertical	Quasi Peak
384.000	31.8	29.1	46.0	14.2	Vertical	Quasi Peak
393.240	30.7	30.5	46.0	15.3	Vertical	Quasi Peak
406.800	29.3	34.9	46.0	11.1	Horizontal	Quasi Peak
417.800	29.2	-	46.0	16.8	Vertical	Quasi Peak
433.920	33	31.2	46.0	13.0	Vertical	Quasi Peak
442.400	36.9	34.0	46.0	9.1	Vertical	Quasi Peak
467.000	33.9	38.0	46.0	8.0	Horizontal	Quasi Peak
500.000	36.0	-	46.0	10.0	Vertical	Quasi Peak

Section 15.209: Spurious Emissions (30 – 6000 MHz) – Continued

NFC operating continuously (NFC ON)

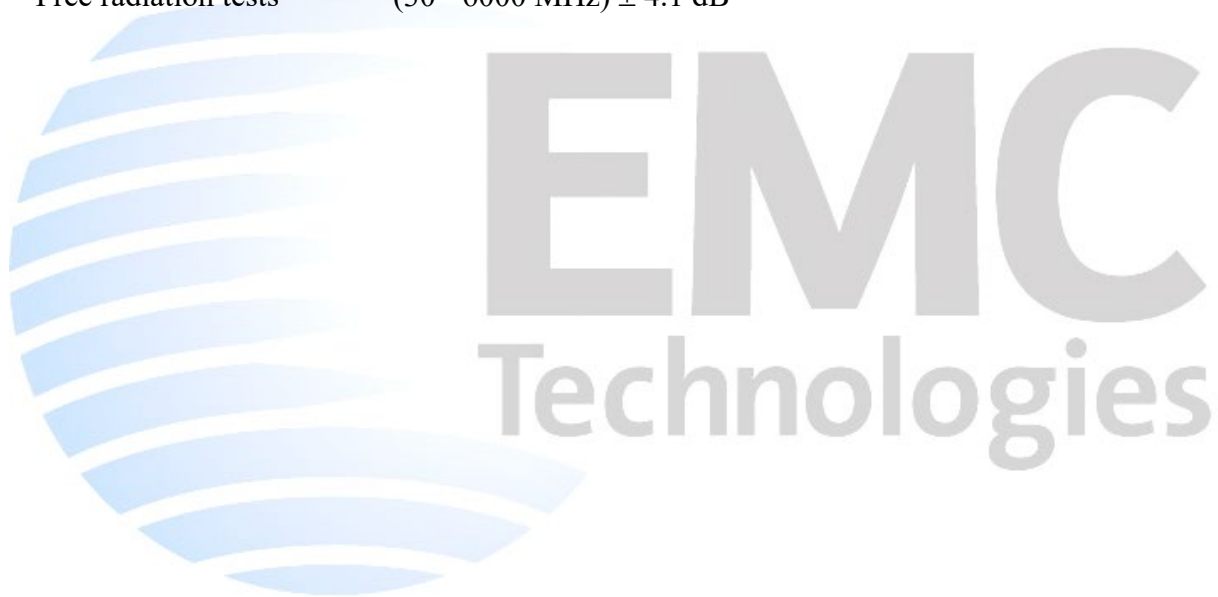
Frequency (MHz)	Vertical (dBuV/m)	Horizontal (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna	Detector
516.120	31.3	-	46.0	14.7	Vertical	Quasi Peak
525.760	28.5	-	46.0	17.5	Vertical	Quasi Peak
2400.000	52.6	-	74.0	21.4	Vertical	Peak
2400.000	37.5	-	54.0	16.5	Vertical	Average
3600.400	54.2	-	74.0	19.8	Vertical	Peak
3600.400	39.6	-	54.0	14.4	Vertical	Average

All other emissions detected had a margin to the limit that exceeded at least 15 dB when measurements were made between 30 - 6000 MHz using both vertical and horizontal polarisations.

Result: Complies.

Measurement uncertainty with a confidence interval of 95% is:

- Free radiation tests (30 - 6000 MHz) ± 4.1 dB



Section 15.225: Fundamental emission:

Measurements were made using a magnetic loop antenna and a receiver with a Quasi Peak detector using a 9 kHz bandwidth.

Measurements were made at a distance of 10 metres with the limit being determined by using the extrapolation factor of 40 dB per decade limit, as detailed in section 15.31 f (2).

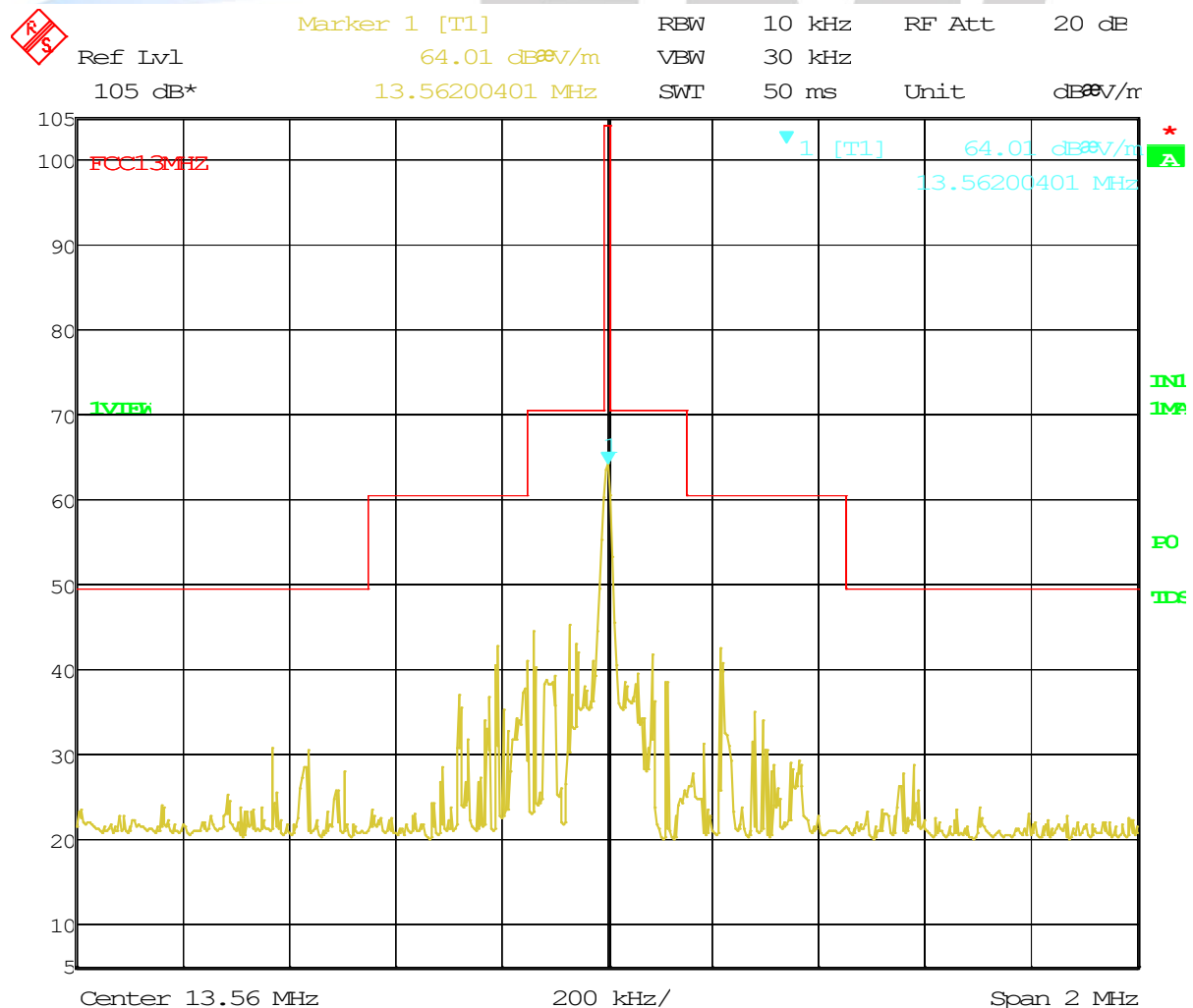
The limit at 30 m at 13.560 MHz is 15,848 uV/m or 84.0 dBuV/m.

Applying the extrapolation factor of 40 dB/ per decade, the limit at 10 m is 103.1 dBuV/m.

The 24 Vdc supply to the device was varied by +/- 15% to determine whether a change in field strength would occur.

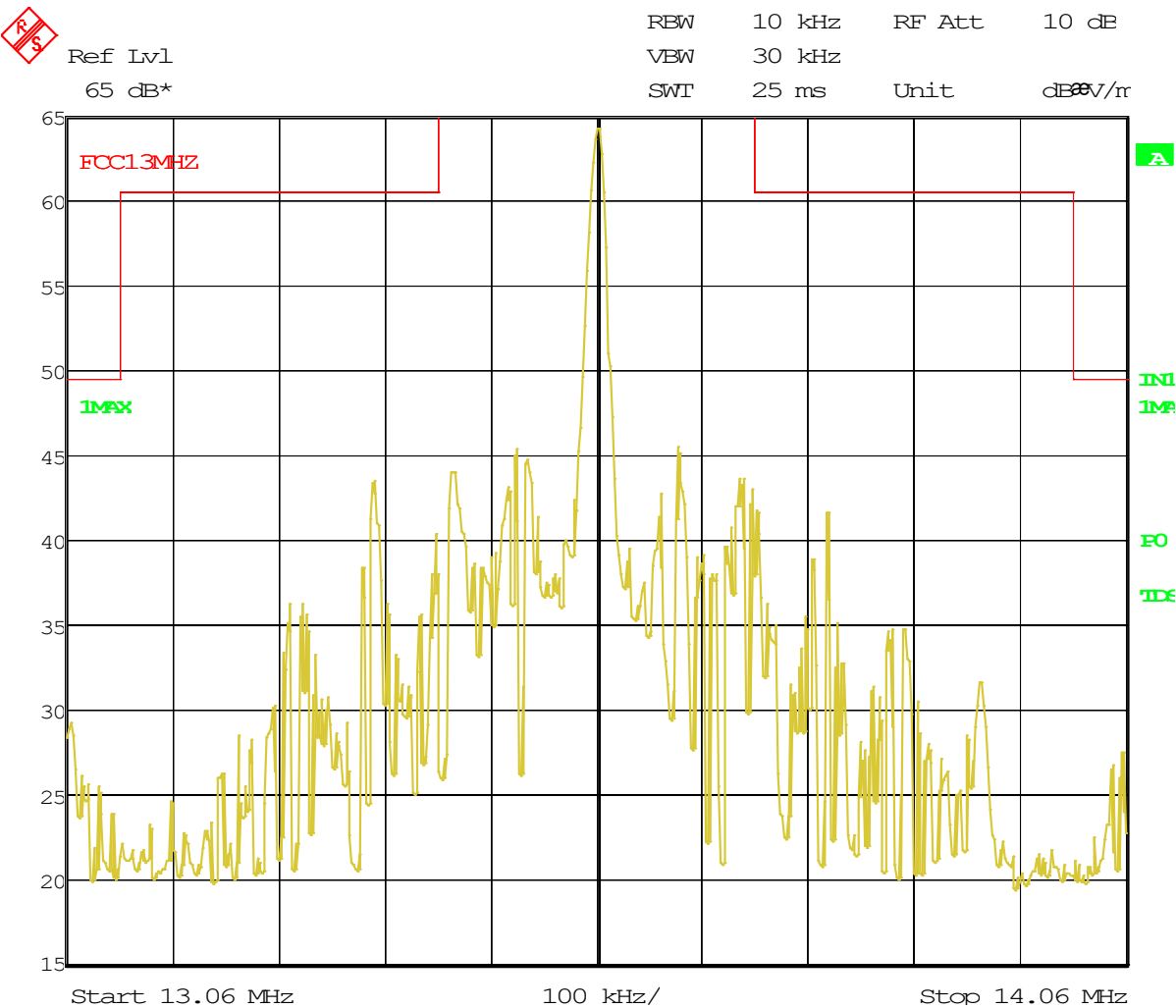
Voltage (Vdc)	Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
20.4	13.560	62.1	103.1	41.1
24.0	13.560	62.1	103.1	41.1
27.6	13.560	62.1	103.1	41.1

Spectrum analyser plot showing the carrier and modulation peaks within +/- 1000 kHz.



Date: 30.AUG.2023 13:58:17

Spectrum analyser plot showing the carrier and modulation peaks within +/- 500 kHz



Date: 30.AUG.2023 13:55:44

Result: Complies.

Measurement uncertainty with a confidence interval of 95% is:

- Free radiation tests (100 kHz – 30 MHz) ± 4.8 dB

Section 15.225: Frequency tolerance:

The frequency tolerance of the carrier is required to be +/- 0.01% of operating frequency when the temperature is varied between -20 degrees C and +50 degrees C.

The device operates nominally on 13.560 MHz which gives a frequency tolerance of +/- 1,356.0 Hz.

Temperature (°C)	Frequency (MHz)	Difference (Hz)
50.0	13.559 452	-548
40.0	13.559 452	-548
30.0	13.559 482	-518
20.0	13.559 510	-490
10.0	13.559 515	-485
0.0	13.559 585	-415
-10.0	13.559 640	-360
-20.0	13.559 653	-347

As a worst case scenario the 24 Vdc supply to the device was varied by +/- 15% at 20 degrees C (ambient).

Voltage (Vdc)	Frequency (MHz)	Difference (Hz)
20.4	13.559 482	-453
24.0	13.559 486	-448
27.6	13.559 484	-457

The frequency tolerance above has been calculated by subtracting the Measured Frequency from the Nominal Frequency (13.560 MHz).

Result: Complies.

Measurement uncertainty with a confidence interval of 95% is:
Frequency tolerance $\pm$ 50 Hz

7. TEST EQUIPMENT USED

Instrument	Manufacturer	Model	Serial No	Asset Ref	Cal Due	Period
Aerial Controller	EMCO	1090	9112-1062	RFS 3710	N/A	N/A
Aerial Mast	EMCO	1070-1	9203-1661	RFS 3708	N/A	N/A
Loop	EMCO	6502	9003-2485	3798	24 Jun 2026	5 years
Biconical	Schwarzbeck	BBA 9106	9124-420 + 04272023E	3802	02 May 2026	3 years
Heliastax cable	Andrews	L6PNM-RPD	22869	Oats Cable	09 Jan 2027	1 year
Horn Antenna	EMCO	3115	9511-4629	E1526	24 Jun 2030	5 years
Log Periodic	Schwarzbeck	VUSLP 9111B	9111-113 + 04272023D	EMC4026	02 May 2026	3 years
Mains Network	R & S	ESH2-Z5	881362/034	3628	09 Jul 2027	3 years
Receiver	R & S	ESIB-40	100295	EMC4030	30 May 2026	3 years
Receiver	R & S	ESHS 10	828404/005	3728	03 Dec 2026	2 years
Pulse Limiter	R & S	ESH3-Z2	100363	EMC4032	05 Dec 2026	2 years
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709	N/A	N/A
VHF Balun	Schwarzbeck	VHBB9124	9124-420 + 04272023E	3801	02 May 2026	3 years
Power Supply	APT	7008	4170003	-	N/A	N/a
Thermal chamber	Contherm	M180F	86025	N/a	N/A	N/a
Thermometer	DSIR	RT200	35	EMC4029	9 April 2025	5 years

All test equipment was within calibration at the time of testing.

8. ACCREDITATIONS

Testing was carried out in accordance with EMC Technologies NZ Ltd designation as a FCC Accredited Laboratory by International Accreditation New Zealand, designation number: NZ0002 under the APEC TEL MRA.

All testing was carried out in accordance with the terms of EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025.

All measurement equipment has been calibrated in accordance with the terms of the EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025.

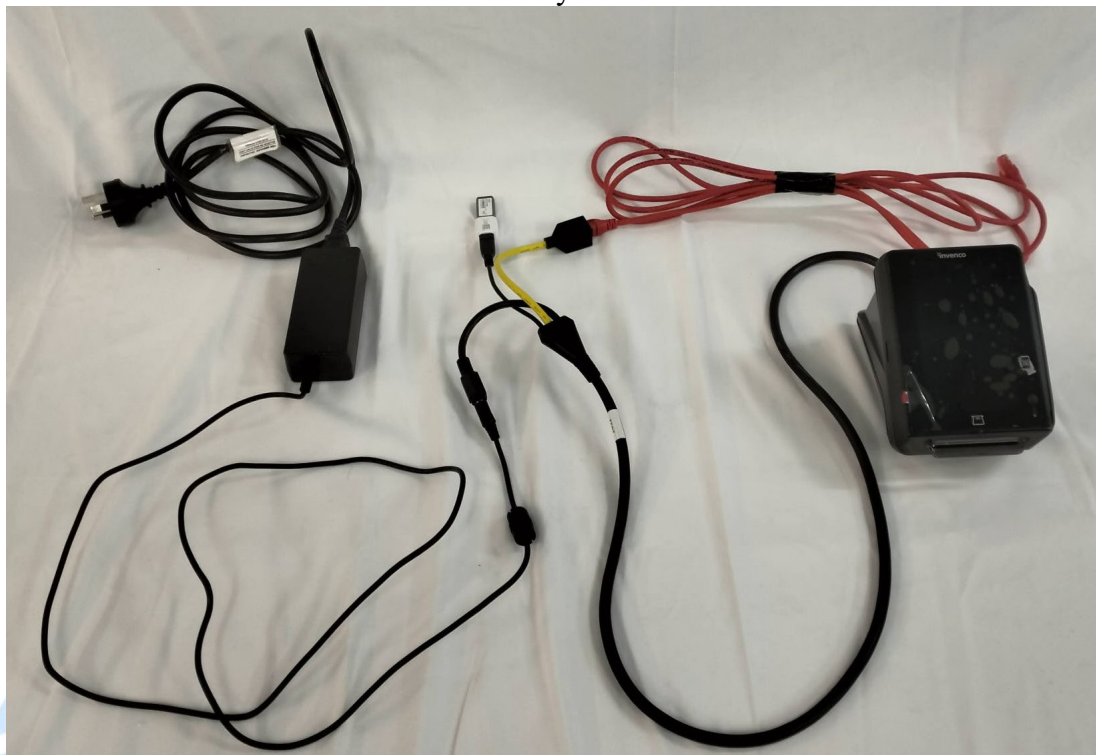
International Accreditation New Zealand has International Laboratory Accreditation Council (ILAC) Mutual Recognition Arrangements for testing and calibration with various accreditation bodies in a number of economies.

This includes NATA (Australia), UKAS (UK), SANAS (South Africa), NVLAP (USA), A2LA (USA), SWEDAC (Sweden).

Further details can be supplied on request.

9. PHOTOGRAPHS

Full System



G6-500 IPT – Front



G6-500 IPT – Sides





G6-500 IPT – Base



G6-500 IPT – Case Removed



G6-500 IPT – Label



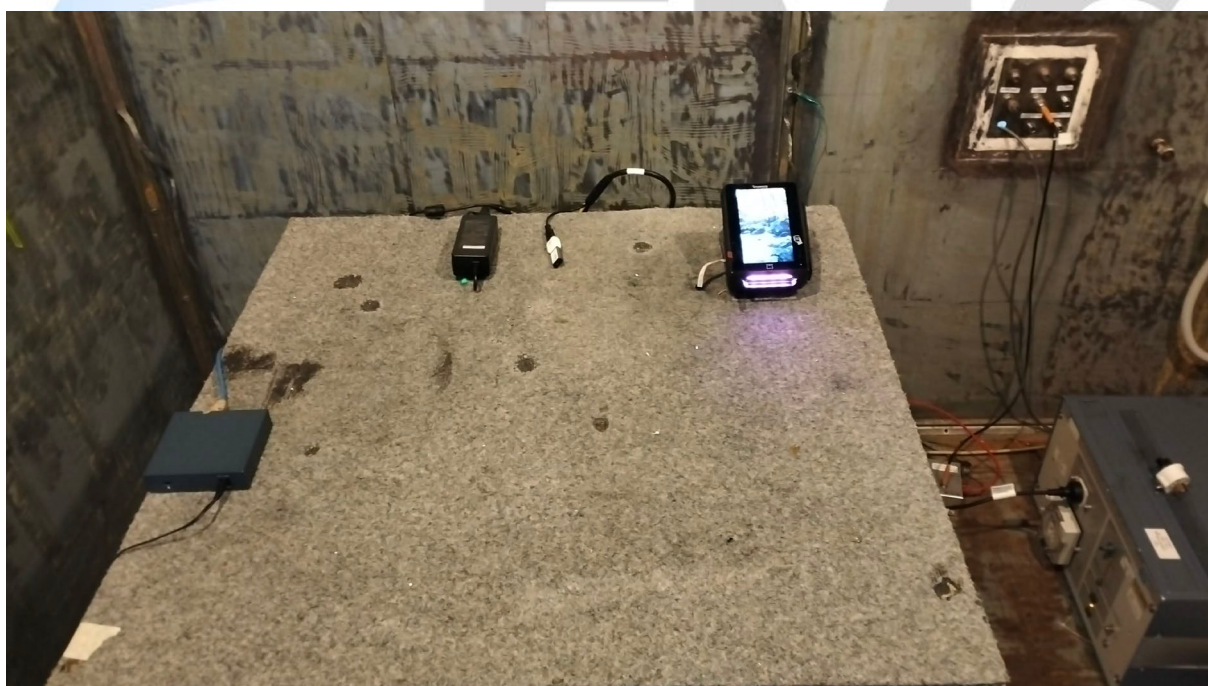
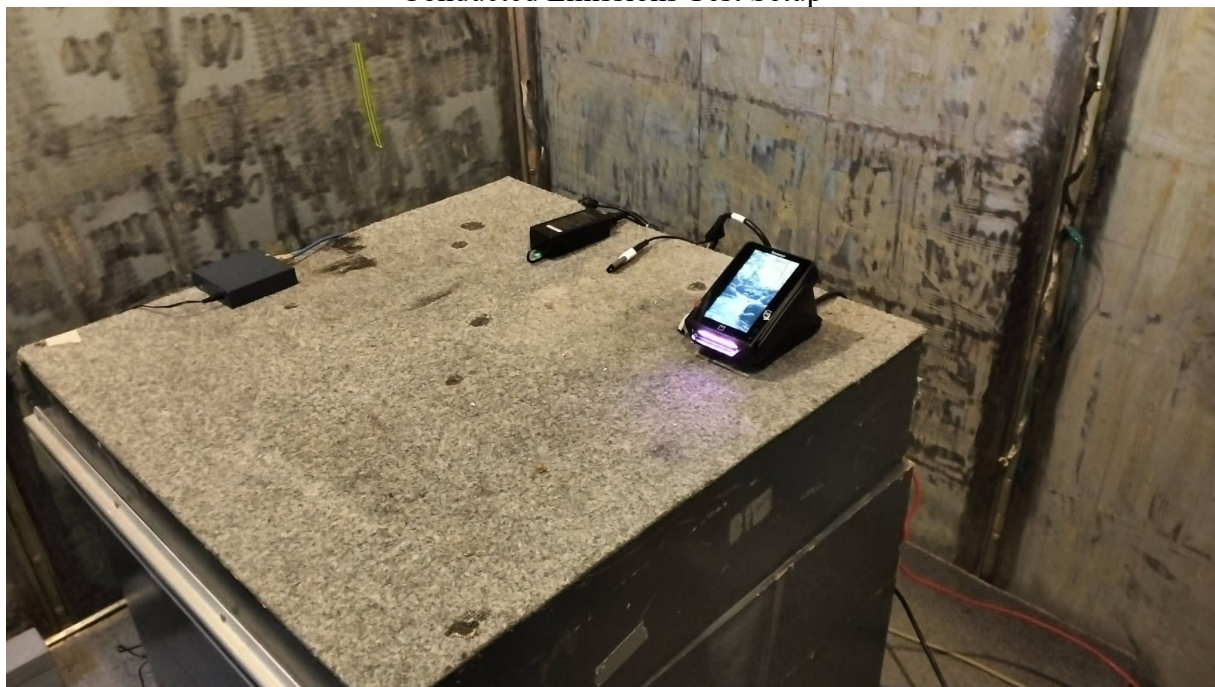
Power Supply Unit – Label

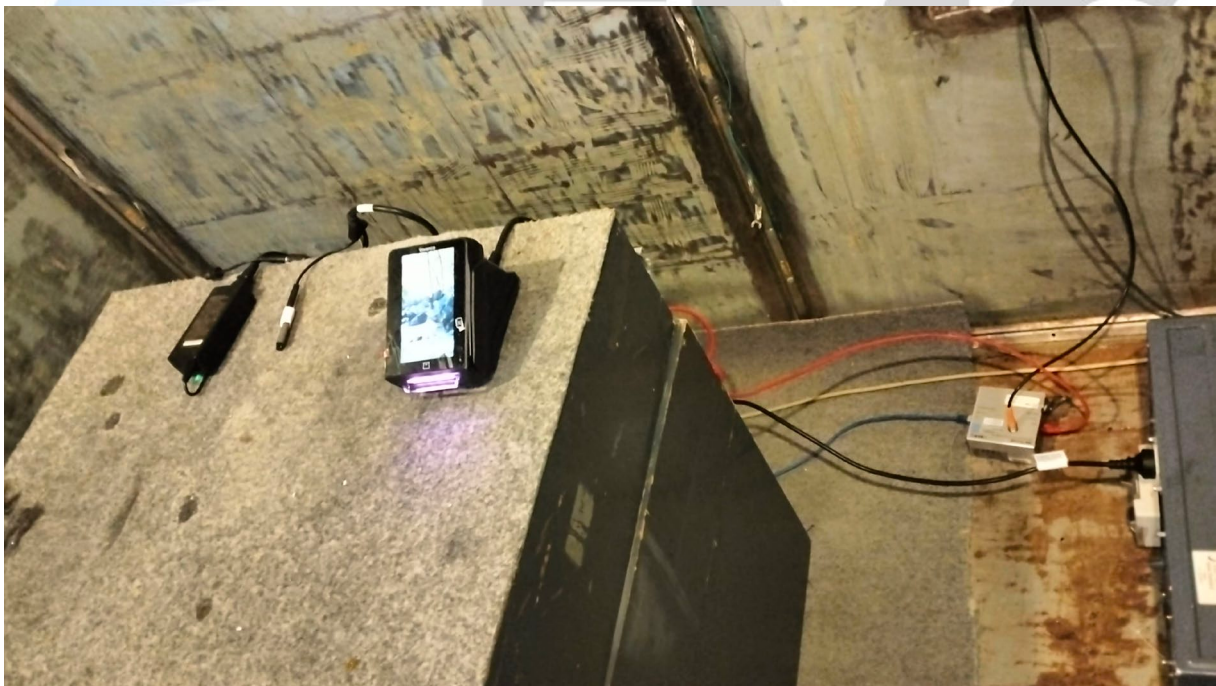


Ethernet Switch – Label

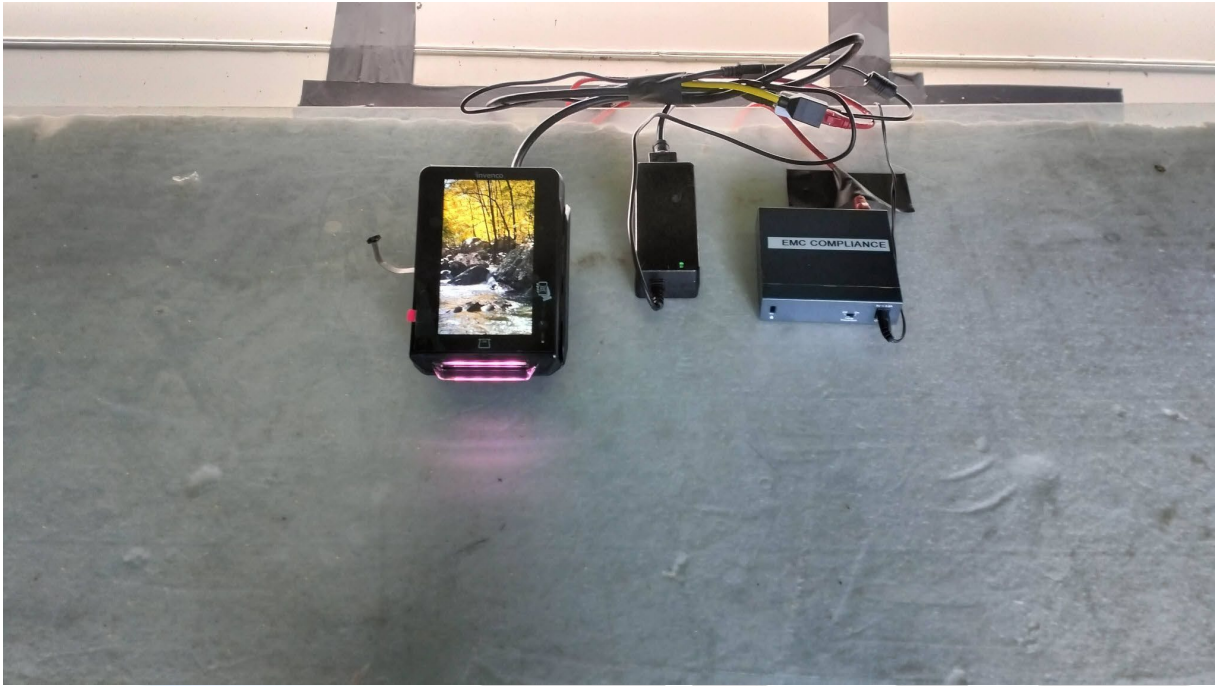


Conducted Emissions Test Setup





\Radiated Emissions Test Setup – Front



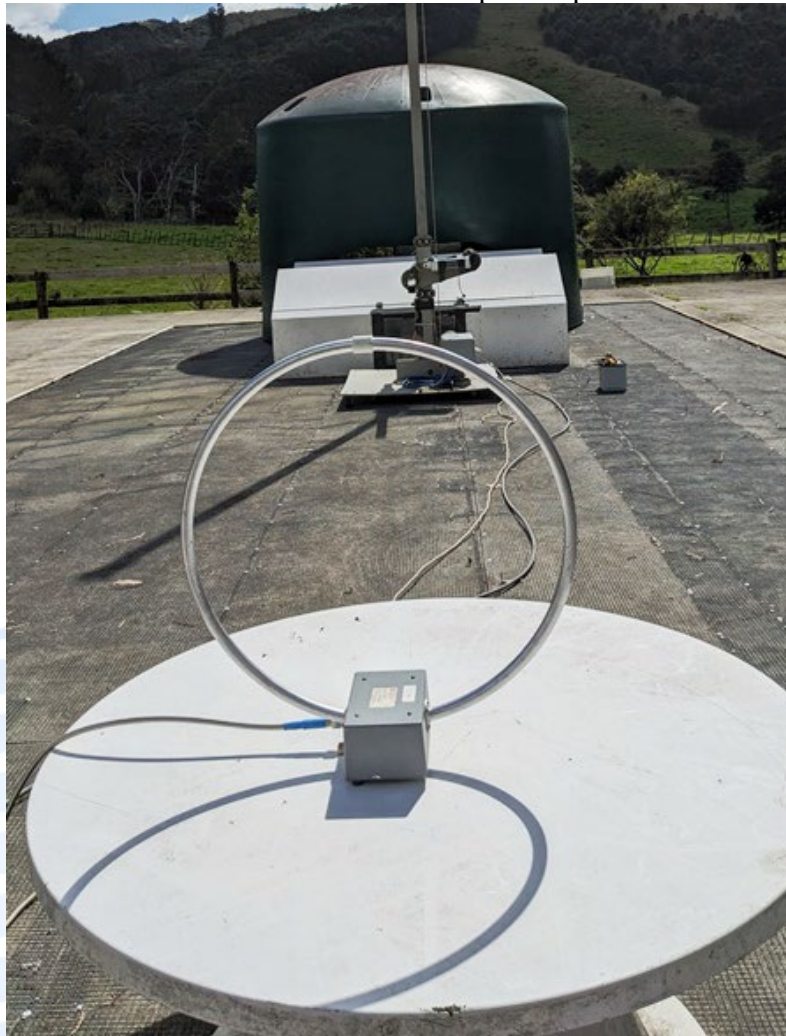
Radiated Emissions Test Setup – Rear



Test Site Overall



Radiated Emissions Test Setup - Loop Antenna



Radiated Emissions Test Setup - Biconical Antenna



Radiated Emissions Test Setup - Log Periodic Antenna



Radiated Emissions Test Setup - Horn Antenna

