TEST REPORT

Report Number: 103394702MIN-001B
Project Number: G103394702

Testing performed on the
353-210-US
Class II Permissive Changes

FCC ID: USE353210

to
47 CFR Part 15.207 & 15.209; Part 15.215:2018
47 CFR, Part 15:2018, §15.107 and §15.109, Class A

For
Paxton Access Ltd

Test Performed by:
Intertek Testing Services NA, Inc.
7250 Hudson Blvd., Suite 100
Oakdale, MN 55128 USA

Test Authorized by:
Paxton Access Ltd
Paxton House
Home Farm Road
Brighton E. SUSX BN1 9HU, United Kingdom

Prepared by: Richard Blonigen

Reviewed by: Norman Shpilsher

Date of issue: March 28, 2018

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1.0 GENERAL DESCRIPTION

Model:	353-210-US
Type of EUT:	PROXIMITY P50 compact reader
Intertek ID:	MIN1802270955-010
FCC ID:	USE353210
Related Submittal(s) Grants:	Class II Permissive Changes
Company:	Paxton Access Ltd
Customer:	Walter Riche
Address:	Paxton House Home Farm Road Brighton E. SUSX BN1 9HU, United Kingdom
Phone:	+44 (0)1273 811044
e-mail:	Walter.Riche@paxton.co.uk
Test Standards:	☒ 47 CFR, Part 15:2018, §15.207 &15.209, §15.215 ☒ 47 CFR, Part 15:2018, §15.107 and §15.109, Class B
Type of radio:	☒ Stand -alone ☐ Module ☐ Hybrid
Date Sample Submitted:	February 28, 2018
Test Work Started:	March 1, 2018
Test Work Completed:	March 13, 2018
Test Sample Conditions:	☐ Damaged ☐Poor (Usable) ☒ Good

1.1 Product Description; Test Facility

Product Description:	125kHz Transmitter
Operating Frequency	125kHz
Modulation:	ASK
Antenna(s) Info:	Integral antenna
Antenna Installation:	☐ User ☐ Professional ☒ Factory
Transmitter Power Configuration:	☐ Internal battery ☒ External power source ☒ 13.8 VDC from PS ☐ Other:
Special Test Arrangement:	The transmitter was tested while connected to and powered through Paxton test jig which included power supply
Test Facility Accreditation:	A2LA (Certificate No. 1427.01)
Test Methodology:	Measurements performed according to the procedures in ANSI C63.10-2013

1.2 EUT Configuration

The equipment under test was operated during the measurement under the following conditions:

☐ - Standby
☐ - Continuous
☐ - Continuous un-modulated
☐ - Test program (customer specific)
☐ -

Operating modes of the EUT:

No.	Description
1	The EUT was connected to test jig and was setup to operate in standby/wait mode or to transmit by pressing button. The EUT was able to transmit continuously by continuously pressing the button.

Cables:

No.	Type	Length	Designation	Note
1	6 wires, unshielded	>3m	DC power and communication	

Support equipment/Services:

No.	Item	Description
1	Paxton test jig	A configuration to include power and communication to and from the EUT. Power supply: SW20-S120-24

1.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

☒ **Normal**

Temperature: 15-35°C

Humidity: 30-60%

Atmospheric pressure: 86-106kPa

1.4 Measurement uncertainty

The expanded uncertainty (k = 2) for radiated emissions from 30 to 1000 MHz has been determined to be: ±4 dB at 10m and ±5.4 dB at 3m

The expanded uncertainty (k = 2) for radiated emissions above 1GHz has been determined to be: ±6.4 dB at 3m

The expanded uncertainty (k = 2) for conducted emissions from 150 kHz to 30 MHz has been determined to be:
±2.6 dB

1.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured emissions reading on the EMI Receiver.
The basic equation with a sample calculation is as follows:
FS = RA + AF + CF - AG

Where: FS = Field Strength in dB(µV/m)
RA = Receiver Amplitude in dB(µV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB(m^{-1})
AG = Amplifier Gain in dB

Assume a receiver reading of 48.1 dB(µV) is obtained. The antenna factor of 7.4 dB(m^{-1}) and cable factor of 1.6 dB is added and amplifier gain of 16.0 dB is subtracted giving field strength of 41.1 dB(µV/m).

RA = 48.1 dB(µV)
AF = 7.4 dB(m^{-1})
CF = 1.6 dB
AG = 16.0 dB
FS = RA + AF + CF - AG
FS = 48.1 + 7.4 + 1.6 – 16.0
FS = 41.1 dB(µV/m)

General notes: None

2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST SPECIFICATION	TEST PARAMETERS	RESULT
15.209, 15.215(b)	Field Strength of Fundamental and Spurious Emissions	Pass
15.207	Transmitter Power Line conducted emissions	Pass
15.109	Digital device radiated emissions	Pass
15.107	Digital device conducted emissions	Pass

Notes: Due to Class II Permissive changes, only the above tests were performed.

3.0 TEST CONDITIONS AND RESULTS

3.1 Field Strength of Fundamental and Spurious

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☐ 10 meters ☒ 3 meters

Test result: **Pass**

Max. Emissions margin: **39.4** dB below the limits

Notes: Frequencies above 30MHz were unrelated to the transmitter and were related to unintentional radiation.

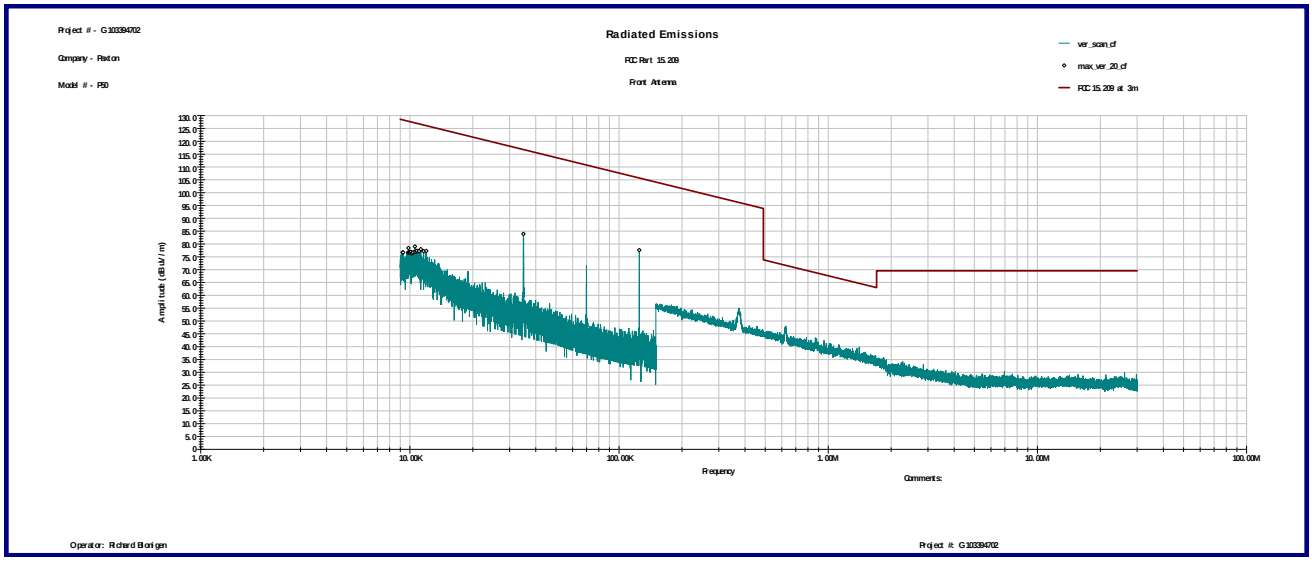
Date:	March 7, 2018	**Result: Pass**
Tested by:	Richard Blonigen	
Standard:	FCC 15.209	
Test Point:	Enclosure with antenna	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 38%(RH); 98kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.1.1

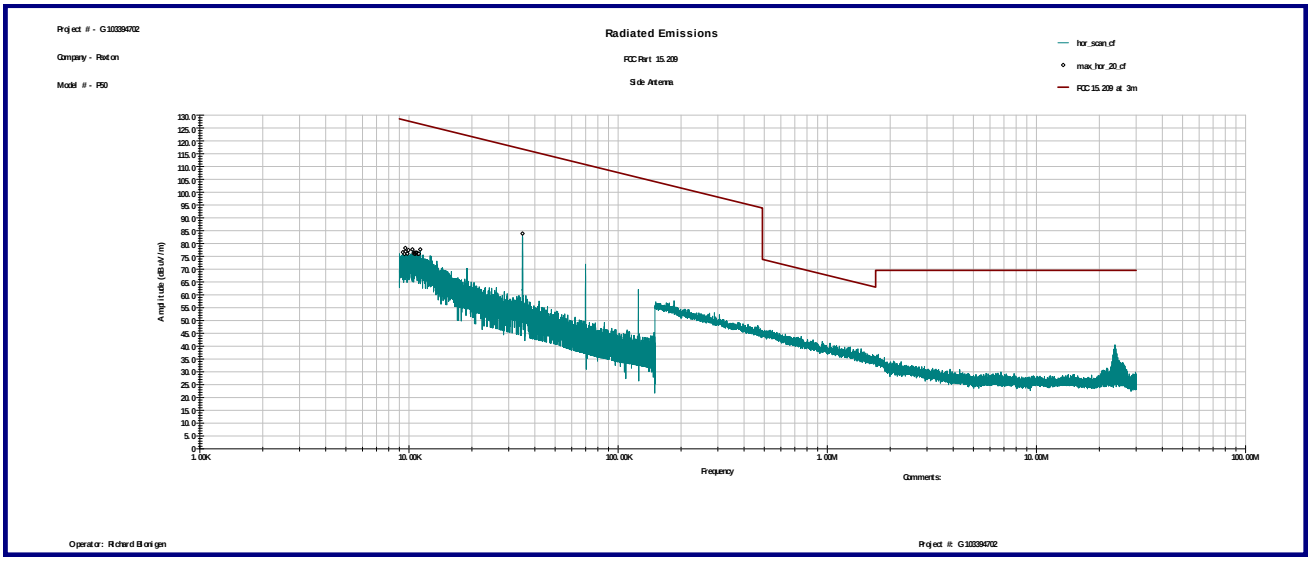
Frequency MHz	Antenna Orient.	Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Reading dBµV	Total @ 3m dBµV/m	15.209 Limit dBµV/m	Distance Factor (dB)	Margin dB	Comments
0.035	Front	75.1	0.0	28.8	8.3	54.6	36.7	80.0	-62.1	
0.070	Front	68.2	0.1	28.8	7.6	47.1	30.7	80.0	-63.6	
0.125	Front	63.5	0.1	28.8	16.4	51.2	25.7	80.0	-54.5	
0.373	Front	54.2	0.1	28.7	13.1	38.7	16.2	80.0	-57.5	
0.627	Front	49.7	0.1	28.7	11.1	32.3	31.7	40.0	-39.4	
0.035	Side	75.1	0.0	28.8	8.2	54.5	36.7	80.0	-62.2	
0.070	Side	68.2	0.1	28.8	7.3	46.8	30.7	80.0	-63.9	
0.125	Side	63.5	0.1	28.8	12.1	46.9	25.7	80.0	-58.8	

Graph 3.1.1

Front antenna orientation

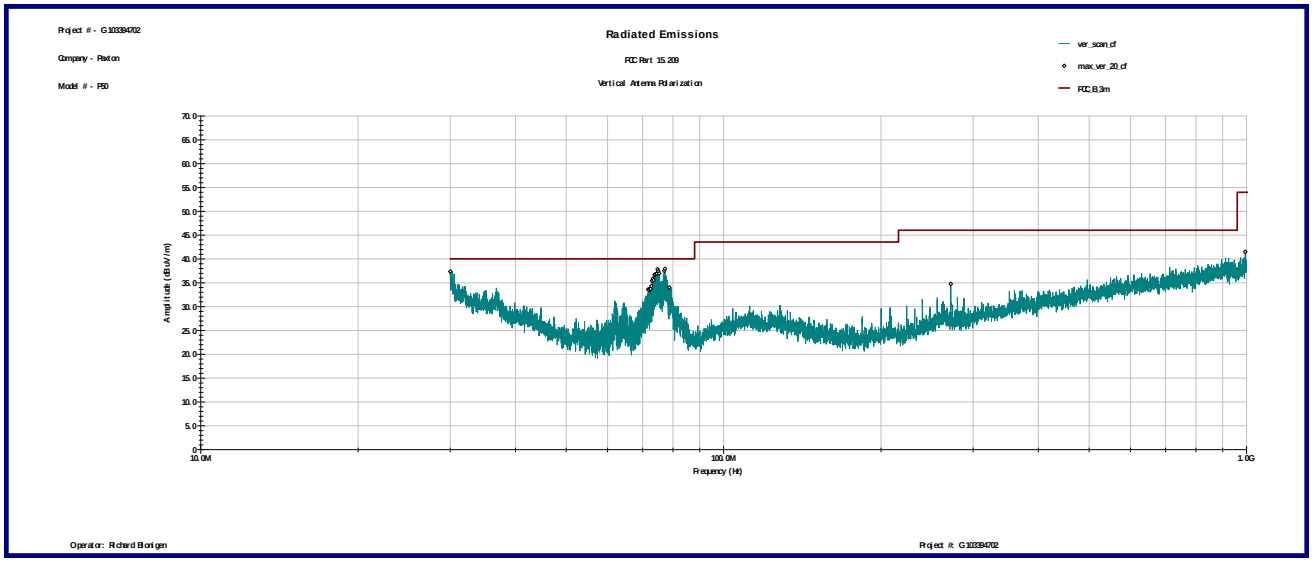


Side antenna orientation

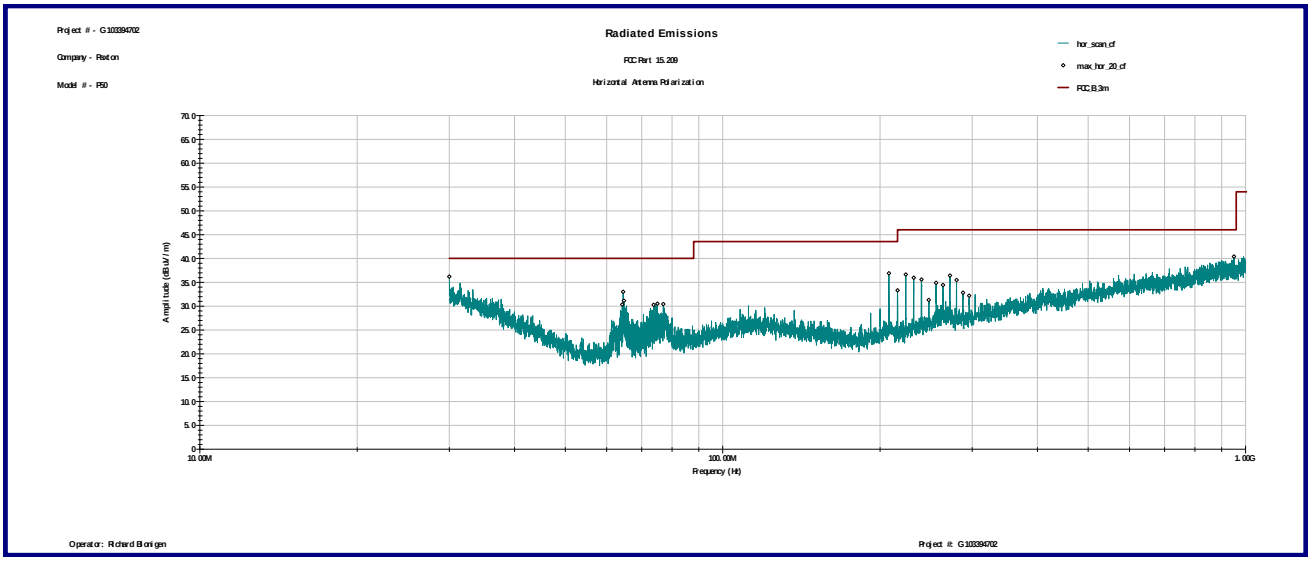


Graph 3.1.2

Vertical antenna polarization



Horizontal antenna polarization



3.2 Transmitter power line conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 9.3 dB below the limits

Note: None

Date:	March 13, 2018	**Result: Pass**
Tested by:	Richard Blonigen	
Standard:	FCC Part 15.207	
Test Point:	Power Line	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 37%(RH); 98kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.2.1

Line 1

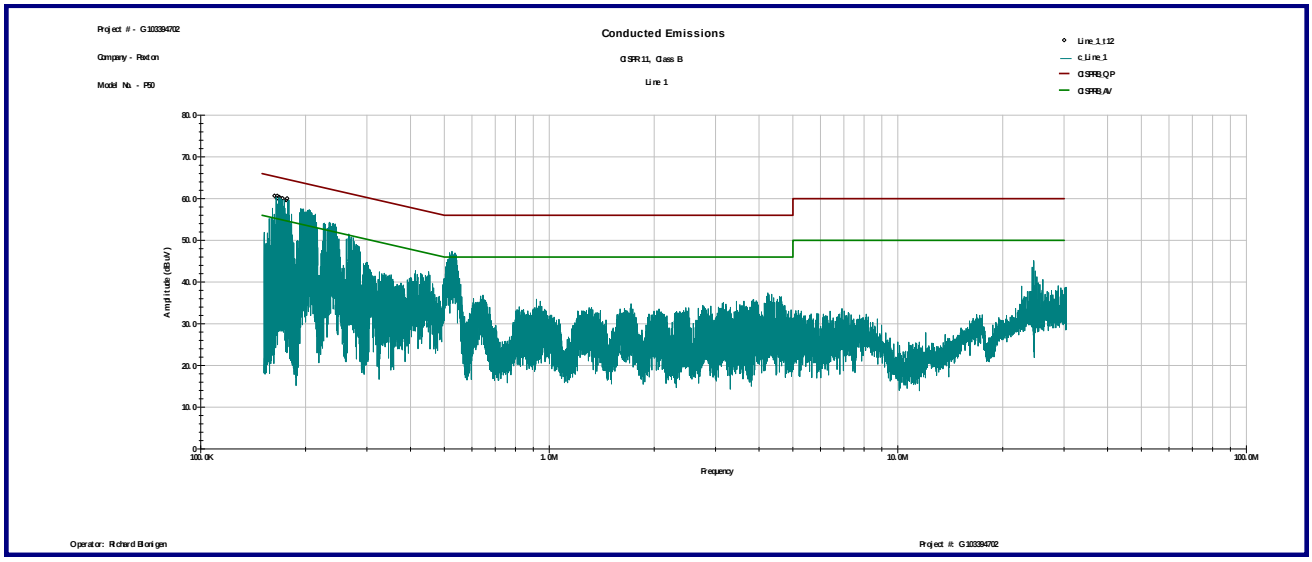
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.168	55.3	41.9	0.1	65.1	55.1	-9.7	-13.1
0.210	51.3	36.9	0.1	63.2	53.2	-11.8	-16.2
0.237	48.9	36.5	0.1	62.2	52.2	-13.2	-15.6
0.271	47.5	35.8	0.1	61.1	51.1	-13.5	-15.2
0.530	45.3	31.7	0.2	56.0	46.0	-10.5	-14.1
24.240	44.2	33.2	1.2	60.0	50.0	-14.6	-15.6

Line 2

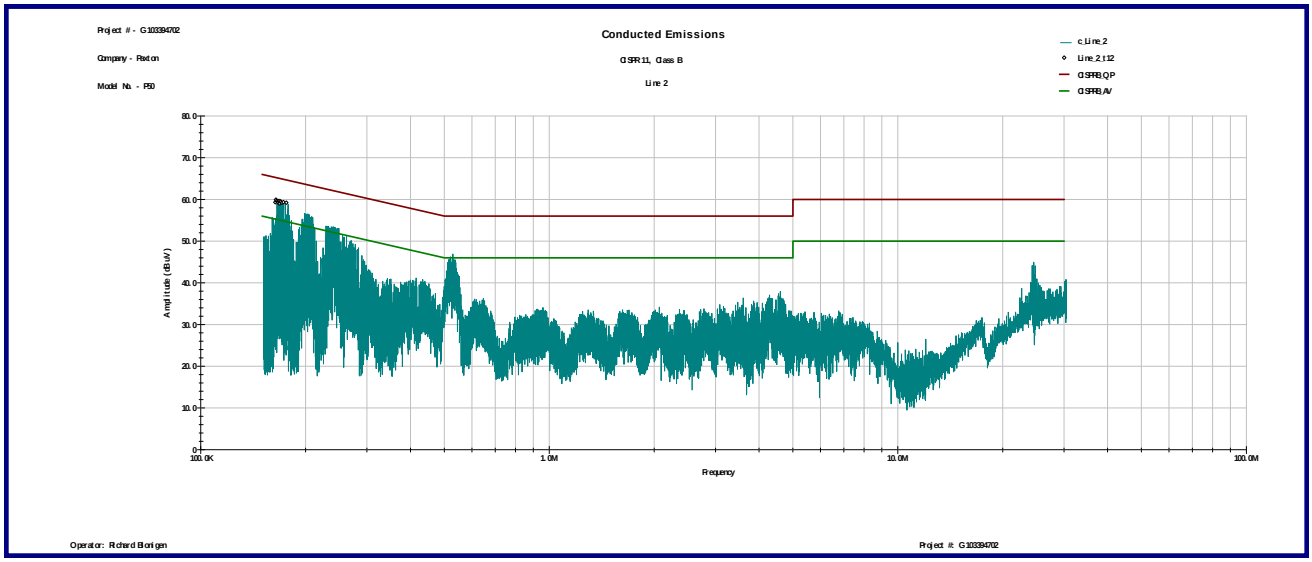
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.176	55.3	41.7	0.1	64.7	54.7	-9.3	-12.9
0.200	51.5	37.9	0.1	63.6	53.6	-12.0	-15.6
0.234	48.8	36.9	0.1	62.3	52.3	-13.4	-15.3
0.280	47.0	35.4	0.1	60.8	50.8	-13.7	-15.3
0.522	45.3	31.9	0.2	56.0	46.0	-10.5	-13.9
24.240	43.2	33.1	1.2	60.0	50.0	-15.6	-15.7

Graph 3.2.1

Line 1



Line 2



3.3 Digital device radiated emissions

Test location: ☐ OATS ☒ Anechoic Chamber

Test distance: ☐ 10 meters ☒ 3 meters

Test result: **Pass**

Frequency range: 30MHz-1000MHz

Max. Emissions margin: 10.3 dB below the limits

Notes: The Radiated Emissions scan was performed in the Anechoic chamber at 3m measurement distance (see Tables 3.5.1-3.5.2 and Graphs 3.5.1 – 3.5.4).

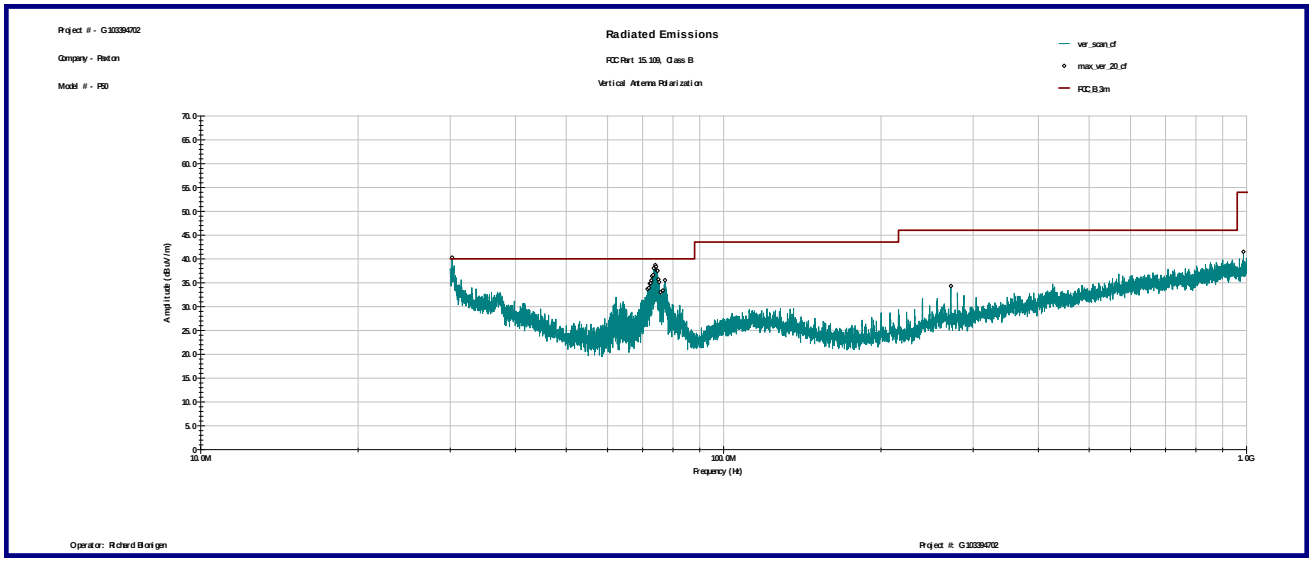
Date:	March 7, 2017	**Result: Pass**
Tested by:	Richard Blonigen	
Standard:	FCC Part 15.109, Class B	
Test Point:	Enclosure	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 38%(RH); 8kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.3.1

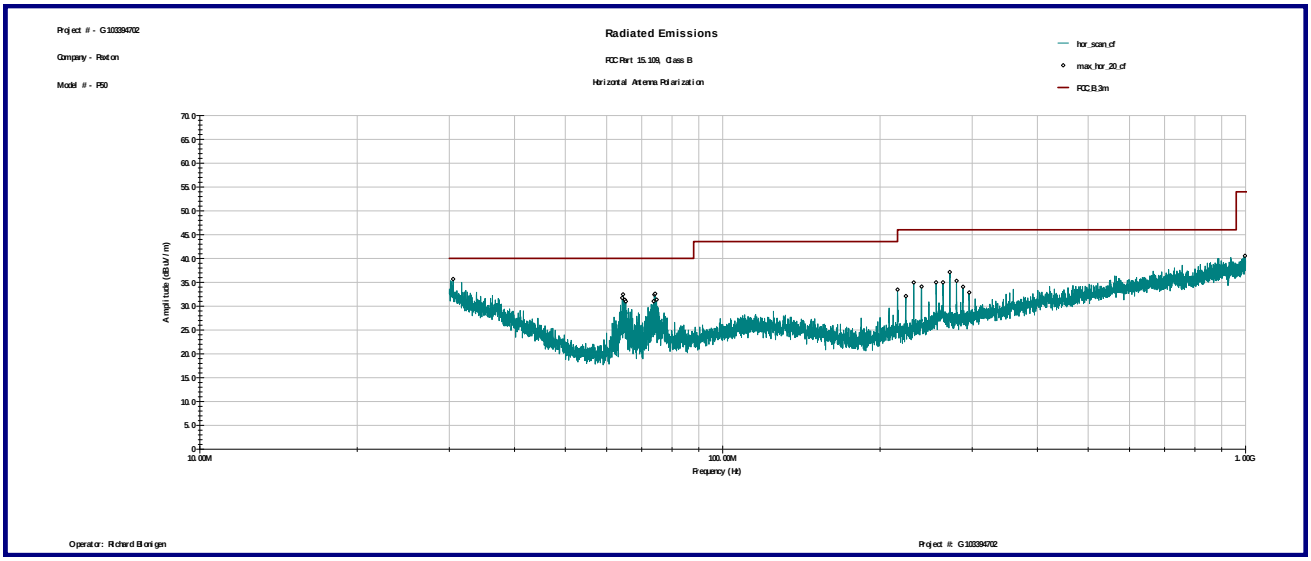
Frequency	Antenna		Ant. CF	Cable loss	Pre-amp	QP Reading	Total @ 3m	Limit	Margin	Comments
MHz	Polarity	Hts(cm)	dB1/m	dB	Gain (dB)	dBµV	dBµV/m	dBµV/m	dB	
31.10	V	100	23.5	0.4	0.0	5.6	29.5	40.0	-10.5	
62.28	V	100	10.3	0.6	0.0	8.9	19.7	40.0	-20.3	
74.50	V	100	11.0	0.6	0.0	12.3	24.0	40.0	-16.0	
272.10	V	100	17.6	1.3	0.0	12.6	31.5	46.0	-14.5	
30.50	H	100	23.8	0.4	0.0	5.5	29.7	40.0	-10.3	
64.48	H	100	10.2	0.6	0.0	9.9	20.7	40.0	-19.3	
74.27	H	100	11.0	0.6	0.0	9.5	21.2	40.0	-18.8	
271.88	H	100	17.6	1.3	0.0	15.3	34.2	46.0	-11.8	

Graph 3.3.1

Vertical antenna polarization



Horizontal antenna polarization



3.4 Digital device conducted emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test result: **Pass**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: 9.7 dB below the limits

Notes: None

Date:	March 13, 2018	**Result: Pass**
Tested by:	Richard Blonigen	
Standard:	FCC Part 15.107 Class B	
Test Point:	Power Line	
Operation mode:	See page 5	
Environmental Conditions:	23°C; 37%(RH); 98kPa	
Equipment Verification:	☒	
Note:	None	

Table 3.4.1

Line 1

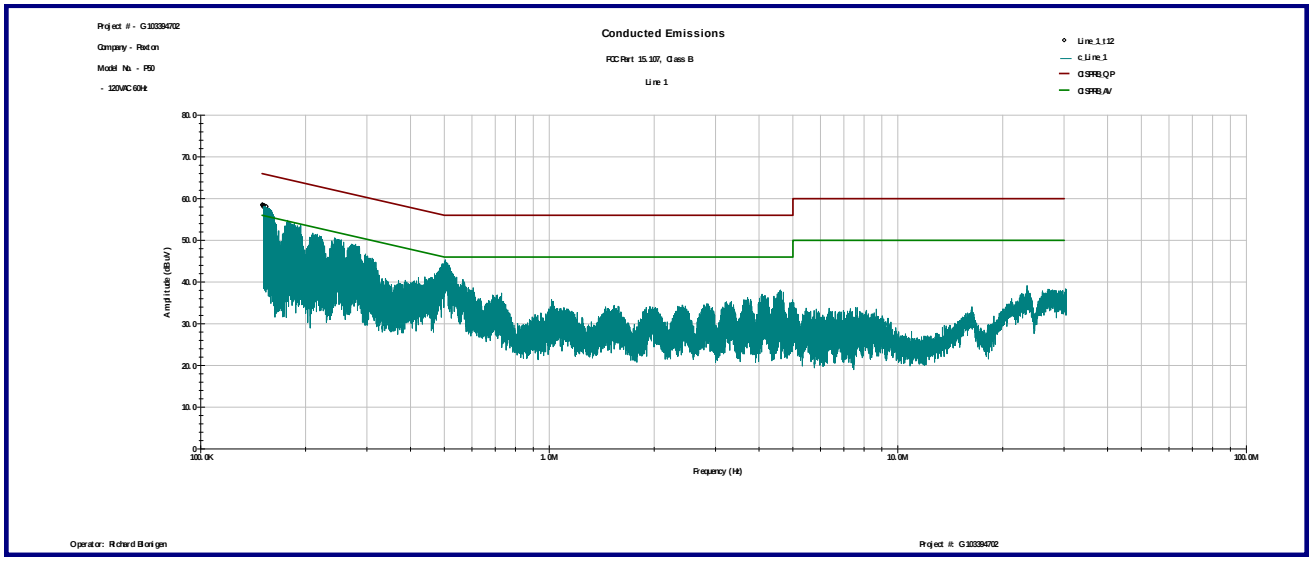
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.154	55.8	42.7	0.1	65.8	55.8	-9.9	-13.0
0.187	51.5	36.5	0.1	64.2	54.2	-12.6	-17.6
0.213	49.5	37.1	0.1	63.1	53.1	-13.5	-15.9
0.254	47.8	35.9	0.1	61.6	51.6	-13.7	-15.6
0.280	45.2	31.9	0.1	60.8	50.8	-15.5	-18.8
0.509	44.6	33.6	0.2	56.0	46.0	-11.2	-12.2

Line 2

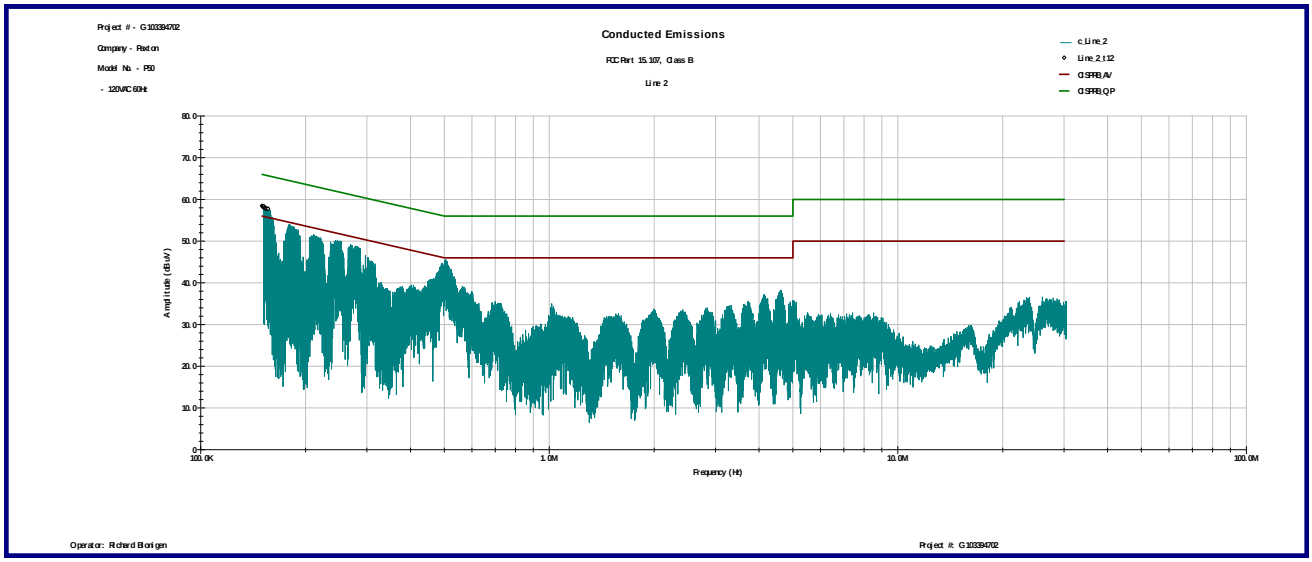
Frequency MHz	QP dBµV	AVG dBµV	Cable Loss dB	QP Lim dBµV	AVG Lim dBµV	QP Margin dB	AVG Margin dB
0.156	55.9	42.2	0.1	65.7	55.7	-9.7	-13.4
0.181	51.9	37.8	0.1	64.4	54.4	-12.5	-16.6
0.212	48.9	37.1	0.1	63.1	53.1	-14.1	-15.9
0.244	47.5	35.5	0.1	62.0	52.0	-14.4	-16.4
0.275	45.5	32.9	0.1	61.0	51.0	-15.4	-18.0
0.500	43.9	33.5	0.2	56.0	46.0	-11.9	-12.3

Graph 3.4.1

Line 1



Line 2



4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	LAST CAL DATE	CAL DUE	USED
Spectrum Analyzer	R & S	ESU	100398	25283	03/21/2017	03/21/2018	☒
Spectrum Analyzer	R & S	FSP 40	100024	12559	01/26/2017	01/26/2018	☒
Spectrum Analyzer	R & S	ESCI	100358	12909	10/30/2017	10/30/2018	☒
Horn Antenna	EMCO	3115	6579	15580	10/04/2017	10/04/2018	☒
Bicono-Log Antenna	Schaffner-Teseq	CBL6112B	2468	9734	06/15/2017	06/15/2018	☒
Loop Antenna	ETS	6512	00060486	19942	01/03/2017	01/03/2018	☒
LISN	COM-Power	Li-215A	191971	172316	06/14/2017	06/14/2018	☒
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	13475	12/01/2016	12/01/2017	☒
System	Quantum Change	TILE! Instrument Control	Ver. 3.4.K.29	15259	VBU	VBU	☒

5.0 Revision History

REVISION LEVEL	DATE	REPORT NUMBER	PREPARED	REVIEWED	NOTES
0	3-28-2018	103394702MIN-001B	RB	NS	Original Issue