



## 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:  
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Oakdale, MN 55128 USA

Test Authorized by:  
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Reviewed by: Norman Shpilsher Date of issue: March 28, 2018  
Norman Shpilsher

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## 1.0 GENERAL DESCRIPTION

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

## 1.1 Product Description; Test Facility

|                                         |                                                                                                                                                                                                                                                                |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product Description:</b>             | 125kHz Transmitter                                                                                                                                                                                                                                             |
| <b>Operating Frequency</b>              | 125kHz                                                                                                                                                                                                                                                         |
| <b>Modulation:</b>                      | ASK                                                                                                                                                                                                                                                            |
| <b>Antenna(s) Info:</b>                 | Integral antenna                                                                                                                                                                                                                                               |
| <b>Antenna Installation:</b>            | <input type="checkbox"/> User <input type="checkbox"/> Professional <input checked="" type="checkbox"/> Factory                                                                                                                                                |
| <b>Transmitter Power Configuration:</b> | <input type="checkbox"/> Internal battery <input checked="" type="checkbox"/> External power source<br><input checked="" type="checkbox"/> 13.8 VDC from PS <input type="checkbox"/> Other: <span style="background-color: #cccccc; padding: 0 10px;"> </span> |
| <b>Special Test Arrangement:</b>        | The transmitter was tested while connected to and powered through Paxton test jig which included power supply                                                                                                                                                  |
| <b>Test Facility Accreditation:</b>     | A2LA (Certificate No. 1427.01)                                                                                                                                                                                                                                 |
| <b>Test Methodology:</b>                | 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:  $\pm 4$  dB at 10m and  $\pm 5.4$  dB at 3m

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

The expanded uncertainty ( $k = 2$ ) for conducted emissions from 150 kHz to 30 MHz has been determined to be:  $\pm 2.6$  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( $\mu$ V/m)

RA = Receiver Amplitude in dB( $\mu$ V)

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( $\mu$ V) 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( $\mu$ V/m).

$$RA = 48.1 \text{ dB}(\mu\text{V})$$

$$AF = 7.4 \text{ dB}(m^{-1})$$

$$CF = 1.6 \text{ dB}$$

$$AG = 16.0 \text{ dB}$$

$$FS = RA + AF + CF - AG$$

$$FS = 48.1 + 7.4 + 1.6 - 16.0$$

$$FS = 41.1 \text{ dB}(\mu\text{V}/\text{m})$$

**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.

---

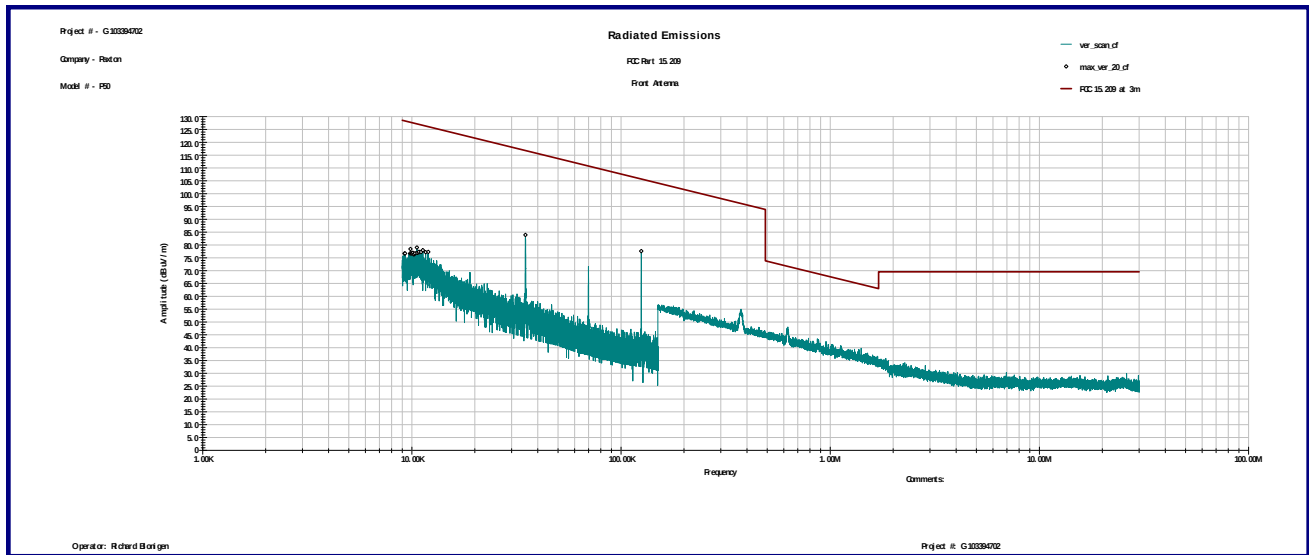
|                                  |                                     |                     |
|----------------------------------|-------------------------------------|---------------------|
| <b>Date:</b>                     | March 7, 2018                       | <b>Result: Pass</b> |
| <b>Tested by:</b>                | Richard Blonigen                    |                     |
| <b>Standard:</b>                 | FCC 15.209                          |                     |
| <b>Test Point:</b>               | Enclosure with antenna              |                     |
| <b>Operation mode:</b>           | See page 5                          |                     |
| <b>Environmental Conditions:</b> | 23°C; 38%(RH); 98kPa                |                     |
| <b>Equipment Verification:</b>   | <input checked="" type="checkbox"/> |                     |
| <b>Note:</b>                     | None                                |                     |

**Table 3.1.1**

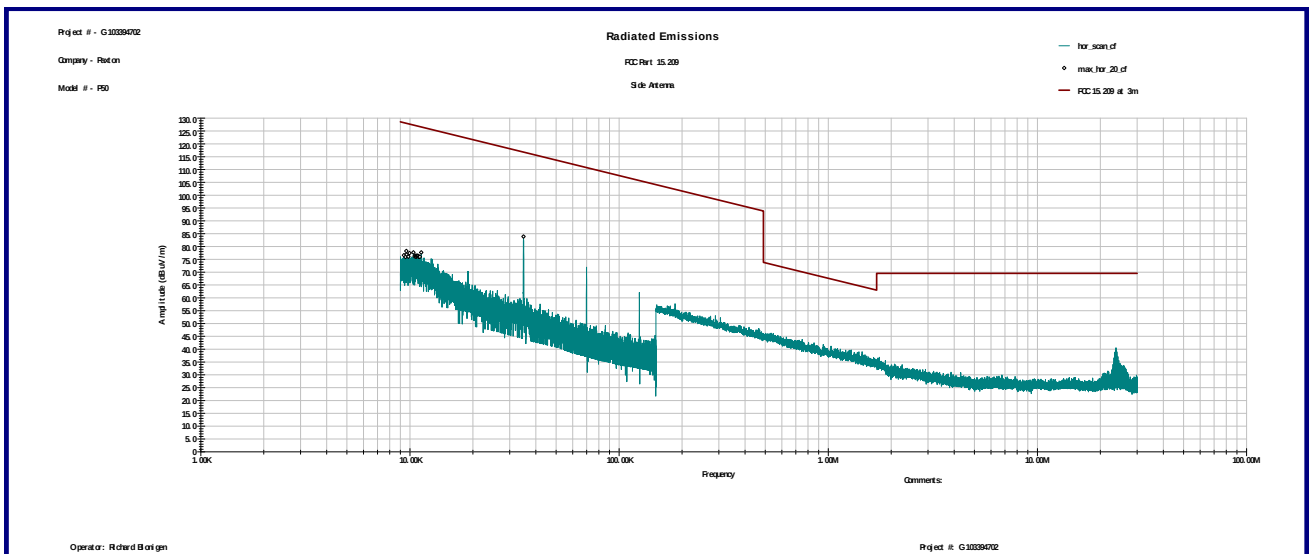
| Frequency<br>MHz | Antenna<br>Orient. | Ant. CF<br>dB1/m | Cable loss<br>dB | Pre-amp<br>Gain (dB) | Reading<br>dBμV | Total @ 3m<br>dBμV/m | 15.209 Limit<br>dBμV/m | Distance<br>Factor (dB) | Margin<br>dB | Comments |
|------------------|--------------------|------------------|------------------|----------------------|-----------------|----------------------|------------------------|-------------------------|--------------|----------|
| 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

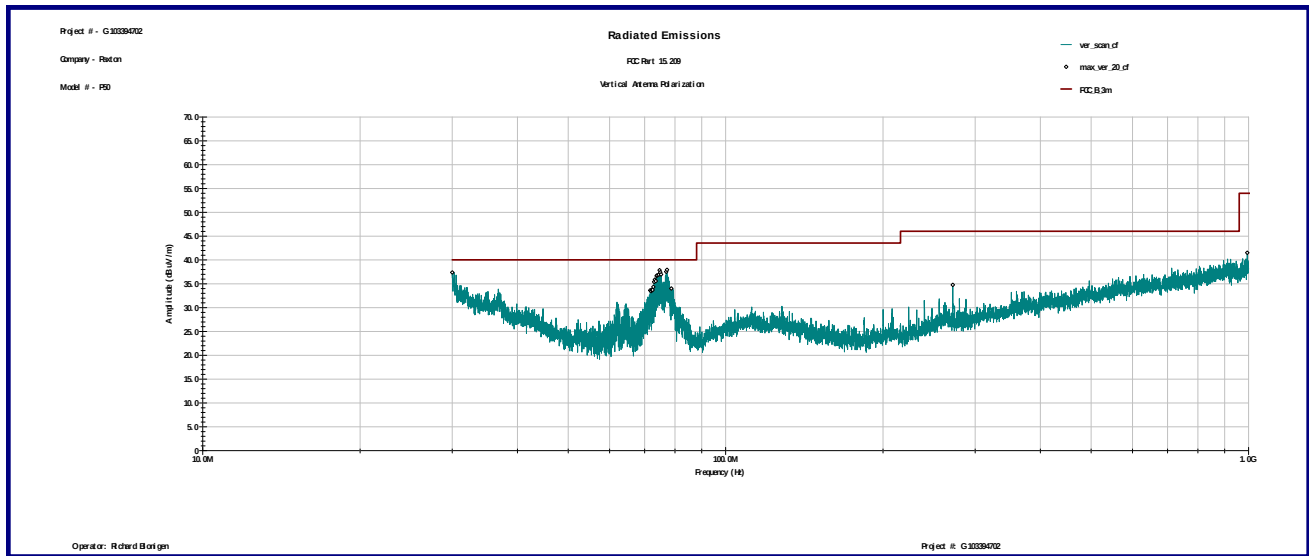


### Side antenna orientation

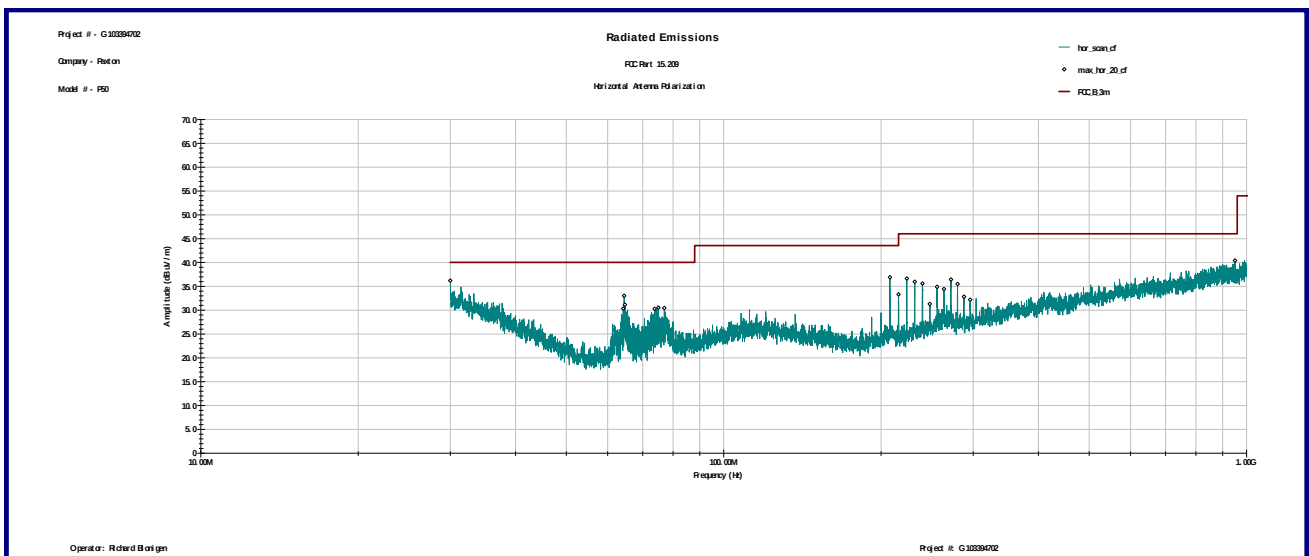


Graph 3.1.2

## 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

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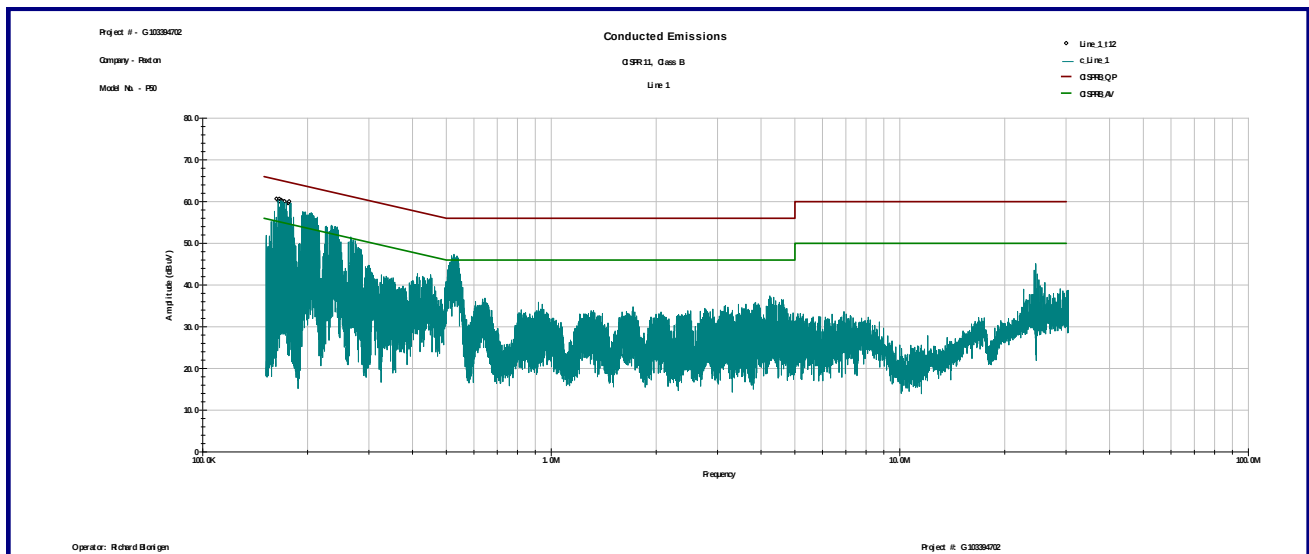
|                                  |                                     |                     |
|----------------------------------|-------------------------------------|---------------------|
| <b>Date:</b>                     | March 13, 2018                      | <b>Result: Pass</b> |
| <b>Tested by:</b>                | Richard Blonigen                    |                     |
| <b>Standard:</b>                 | FCC Part 15.207                     |                     |
| <b>Test Point:</b>               | Power Line                          |                     |
| <b>Operation mode:</b>           | See page 5                          |                     |
| <b>Environmental Conditions:</b> | 23°C; 37%(RH); 98kPa                |                     |
| <b>Equipment Verification:</b>   | <input checked="" type="checkbox"/> |                     |
| <b>Note:</b>                     | None                                |                     |

**Table 3.2.1**

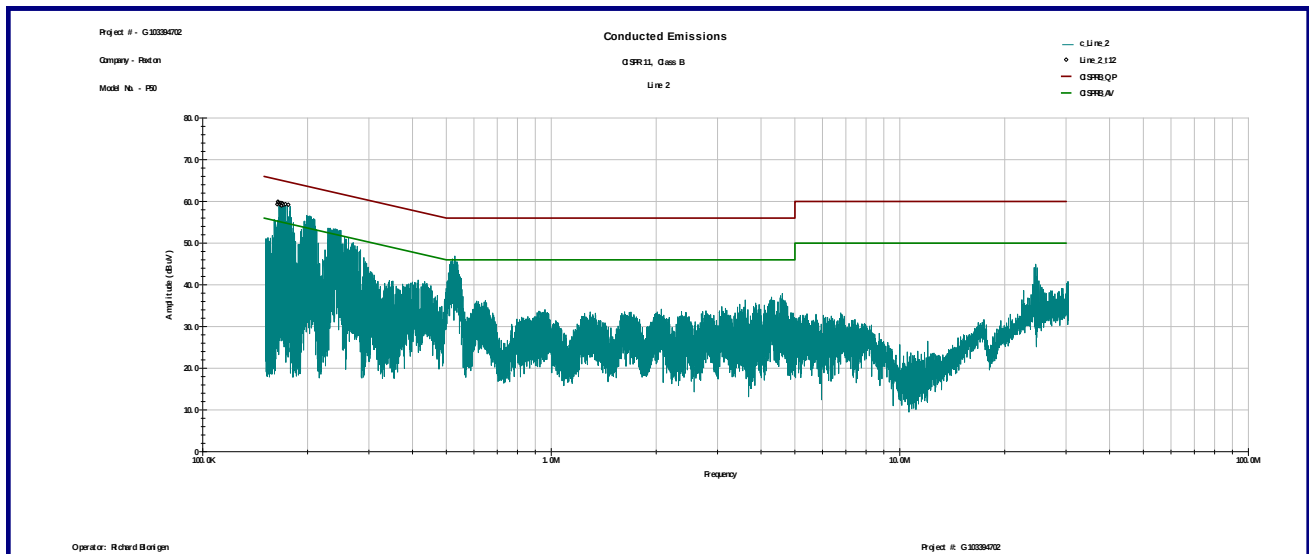
| <b>Line 1</b>    |            |             |                  |                |                 |                 |                  |
|------------------|------------|-------------|------------------|----------------|-----------------|-----------------|------------------|
| Frequency<br>MHz | QP<br>dBμV | AVG<br>dBμV | Cable Loss<br>dB | QP Lim<br>dBμV | AVG Lim<br>dBμV | QP Margin<br>dB | AVG Margin<br>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            |
|                  |            |             |                  |                |                 |                 |                  |
| <b>Line 2</b>    |            |             |                  |                |                 |                 |                  |
| Frequency<br>MHz | QP<br>dBμV | AVG<br>dBμV | Cable Loss<br>dB | QP Lim<br>dBμV | AVG Lim<br>dBμV | QP Margin<br>dB | AVG Margin<br>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).

---

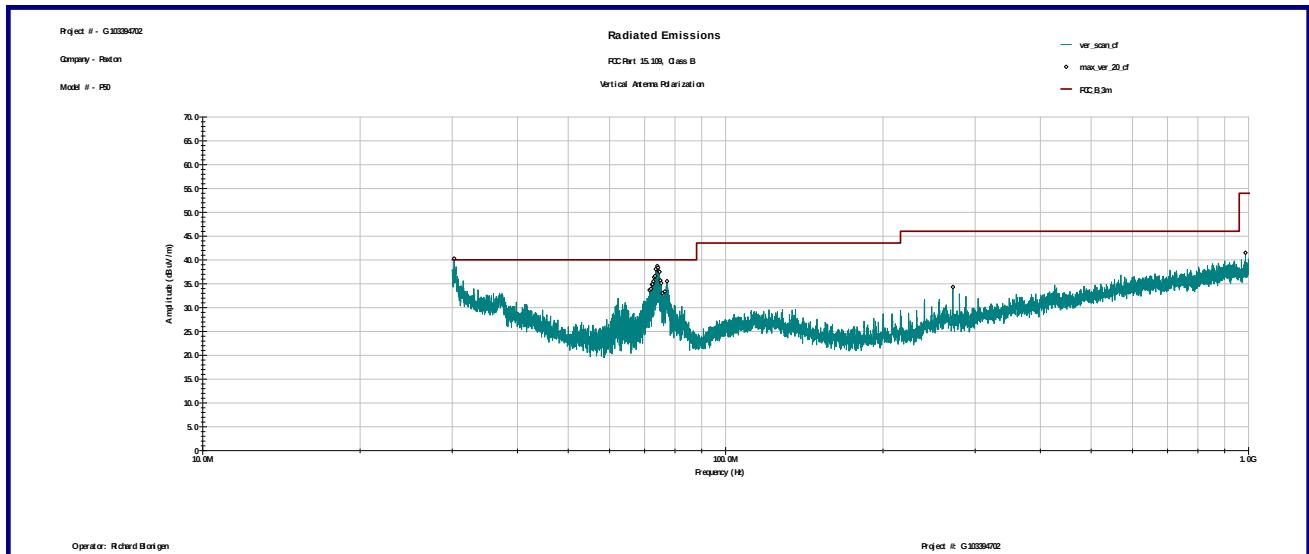
|                                  |                                     |                     |
|----------------------------------|-------------------------------------|---------------------|
| <b>Date:</b>                     | March 7, 2017                       | <b>Result: Pass</b> |
| <b>Tested by:</b>                | Richard Blonigen                    |                     |
| <b>Standard:</b>                 | FCC Part 15.109, Class B            |                     |
| <b>Test Point:</b>               | Enclosure                           |                     |
| <b>Operation mode:</b>           | See page 5                          |                     |
| <b>Environmental Conditions:</b> | 23°C; 38%(RH); 8kPa                 |                     |
| <b>Equipment Verification:</b>   | <input checked="" type="checkbox"/> |                     |
| <b>Note:</b>                     | None                                |                     |

**Table 3.3.1**

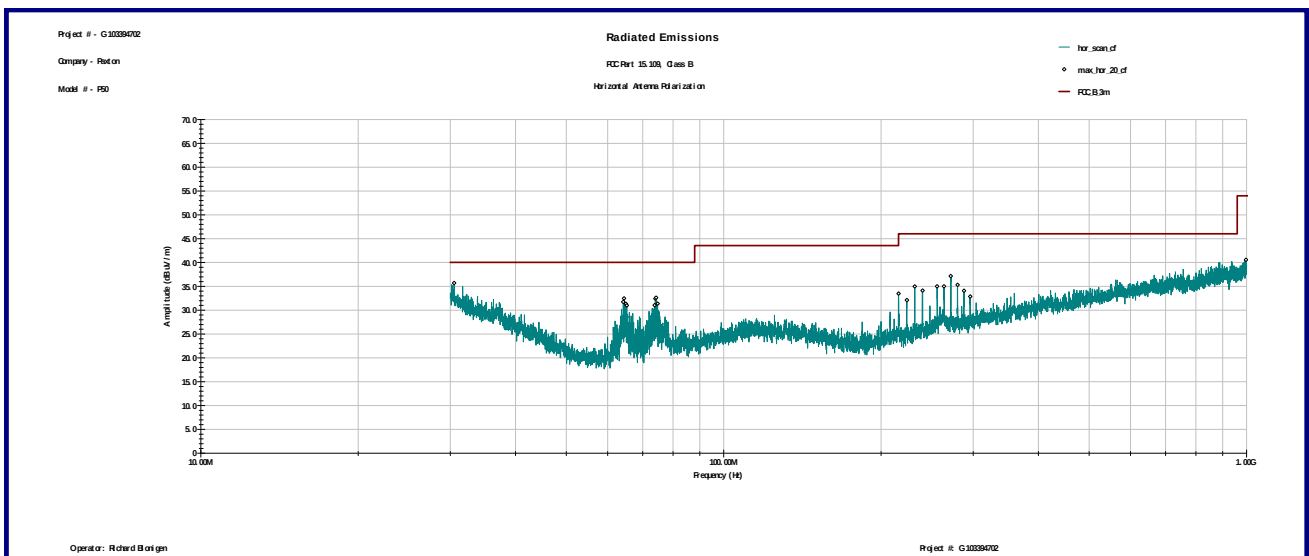
| Frequency<br>MHz | Antenna  |         | Ant. CF<br>dB1/m | Cable loss<br>dB | Pre-amp<br>Gain (dB) | QP Reading<br>dBμV | Total @ 3m<br>dBμV/m | Limit<br>dBμV/m | Margin<br>dB | Comments |
|------------------|----------|---------|------------------|------------------|----------------------|--------------------|----------------------|-----------------|--------------|----------|
|                  | Polarity | Hts(cm) |                  |                  |                      |                    |                      |                 |              |          |
| 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

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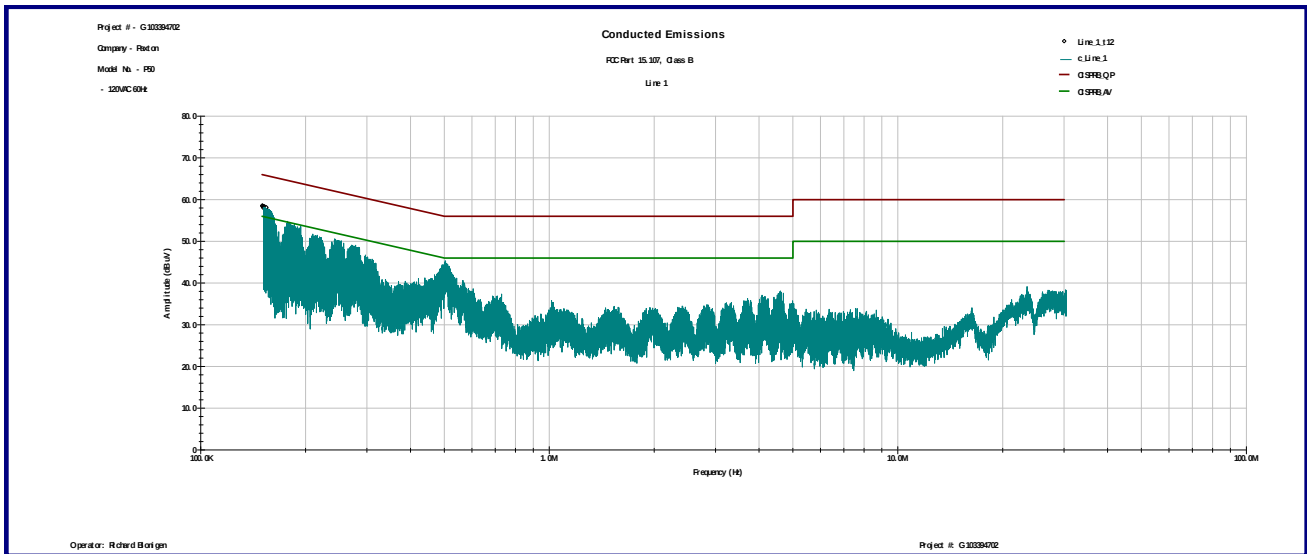
|                                  |                                     |                     |
|----------------------------------|-------------------------------------|---------------------|
| <b>Date:</b>                     | March 13, 2018                      | <b>Result: Pass</b> |
| <b>Tested by:</b>                | Richard Blonigen                    |                     |
| <b>Standard:</b>                 | FCC Part 15.107 Class B             |                     |
| <b>Test Point:</b>               | Power Line                          |                     |
| <b>Operation mode:</b>           | See page 5                          |                     |
| <b>Environmental Conditions:</b> | 23°C; 37%(RH); 98kPa                |                     |
| <b>Equipment Verification:</b>   | <input checked="" type="checkbox"/> |                     |
| <b>Note:</b>                     | None                                |                     |

**Table 3.4.1**

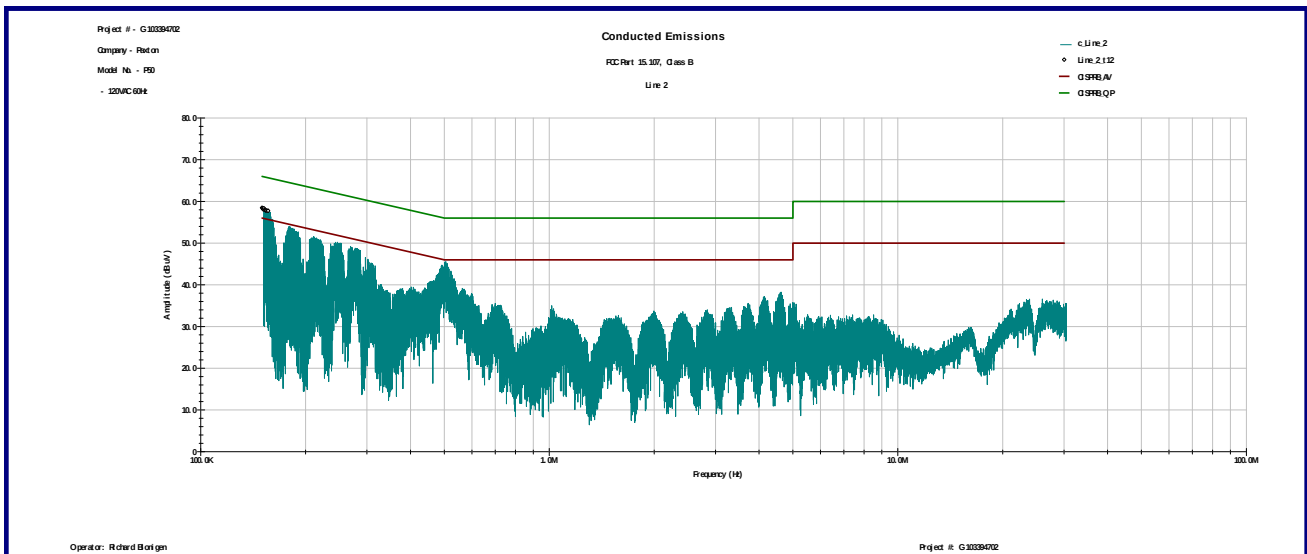
| <b>Line 1</b>    |            |             |                  |                |                 |                 |                  |
|------------------|------------|-------------|------------------|----------------|-----------------|-----------------|------------------|
| Frequency<br>MHz | QP<br>dBμV | AVG<br>dBμV | Cable Loss<br>dB | QP Lim<br>dBμV | AVG Lim<br>dBμV | QP Margin<br>dB | AVG Margin<br>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            |
|                  |            |             |                  |                |                 |                 |                  |
| <b>Line 2</b>    |            |             |                  |                |                 |                 |                  |
| Frequency<br>MHz | QP<br>dBμV | AVG<br>dBμV | Cable Loss<br>dB | QP Lim<br>dBμV | AVG Lim<br>dBμV | QP Margin<br>dB | AVG Margin<br>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 | <input checked="" type="checkbox"/> |
| Spectrum Analyzer  | R & S           | FSP 40                   | 100024        | 12559       | 01/26/2017    | 01/26/2018 | <input checked="" type="checkbox"/> |
| Spectrum Analyzer  | R & S           | ESCI                     | 100358        | 12909       | 10/30/2017    | 10/30/2018 | <input checked="" type="checkbox"/> |
| Horn Antenna       | EMCO            | 3115                     | 6579          | 15580       | 10/04/2017    | 10/04/2018 | <input checked="" type="checkbox"/> |
| Bicono-Log Antenna | Schaffner-Teseq | CBL6112B                 | 2468          | 9734        | 06/15/2017    | 06/15/2018 | <input checked="" type="checkbox"/> |
| Loop Antenna       | ETS             | 6512                     | 00060486      | 19942       | 01/03/2017    | 01/03/2018 | <input checked="" type="checkbox"/> |
| LISN               | COM-Power       | Li-215A                  | 191971        | 172316      | 06/14/2017    | 06/14/2018 | <input checked="" type="checkbox"/> |
| Pre-Amplifier      | MITEQ           | AMF-5D-00501800-28-13P   | 1122951       | 13475       | 12/01/2016    | 12/01/2017 | <input checked="" type="checkbox"/> |
| System             | Quantum Change  | TILE! Instrument Control | Ver. 3.4.K.29 | 15259       | VBU           | VBU        | <input checked="" type="checkbox"/> |

## 5.0 Revision History

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