



# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Proximity panel mount HID reader/390-530

FCC ID: USE390530

To: FCC Part 15.207, Part 15.209 and Part 15.215(c): 2010 Subpart C

**Test Report Serial No:**  
RFI-RPT-RP81268JD12A

<b>This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:</b>		
<b>Checked By:</b>	Ian Watch	
<b>Signature:</b>		
<b>Date of Issue:</b>	15 June 2011	

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## **1. Customer Information**







<b>Company Name:</b>	Paxton Ltd.
<b>Address:</b>	Paxton House Home Farm Brighton Sussex BN1 9HU United Kingdom

## 2. Summary of Testing

### 2.1. General Information

<b>Specification Reference:</b>	47CFR15.207, 47CFR15.209 and 47CFR15.215
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
<b>Site Registration:</b>	FCC: 209735
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
<b>Test Dates:</b>	8 June 2011 to 11 June 2011

### 2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.207	Transmitter AC Conducted Emissions	
Part 15.209	Transmitter Fundamental Field Strength	
Part 15.209	Transmitter Radiated Emissions	
Part 15.215(c)	Transmitter 20 dB Bandwidth	
<b>Key to Results</b>	 = Complied  = Did not comply	

### 2.3. Methods and Procedures

<b>Reference:</b>	ANSI C63.4 (2009)
<b>Title:</b>	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

### 2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

### **3. Equipment Under Test (EUT)**

#### **3.1. Identification of Equipment Under Test (EUT)**

<b>Brand Name:</b>	Paxton
<b>Model Name or Number:</b>	Proximity panel mount HID reader 390-530
<b>Serial Number:</b>	Not marked or stated
<b>Hardware Version Number:</b>	z-hd01 rev 2
<b>Software Version Number:</b>	Not stated
<b>FCC ID:</b>	USE390530

#### **3.2. Description of EUT**

The equipment under test was a Proximity panel mount HID reader with 117 kHz carrier frequency.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

#### **3.4. Additional Information Related to Testing**

<b>Tested Technology:</b>	RFID	
<b>Power Supply Requirement:</b>	Nominal	12 V
<b>Type of Unit:</b>	Transceiver	
<b>Modulation:</b>	AM	
<b>Transmit Frequency:</b>	117 kHz	

#### **3.5. Support Equipment**

The following support equipment was used to exercise the EUT during testing:

<b>Description:</b>	Net2 1 door ACU with 2A PSU in plastic cabinet
<b>Brand Name:</b>	Paxton
<b>Model Name or Number:</b>	411-501
<b>Serial Number:</b>	Not marked or stated

## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

The EUT was tested in the following operating mode(s):

- Constantly transceiving at maximum power.

### **4.2. Configuration and Peripherals**

The EUT was tested in the following configuration(s):

- Connected via a 5 metre multicore cable to a Net2 ACU reader port contained inside a 2A PSU cabinet. Net2 1 door ACU was connected to a 120 VAC 60 Hz supply for all tests.

## **5. Measurements, Examinations and Derived Results**

### **5.1. General Comments**

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to Section 6 Measurement Uncertainty for details.



**5.2. Test Results****5.2.1. Transmitter AC Conducted Spurious Emissions****Test Summary:**

<b>Test Engineer:</b>	Patrick Jones	<b>Test Date:</b>	08 June 2011
<b>Test Sample:</b>	Not stated		

<b>FCC Part:</b>	15.207
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	23

**Results: Live/Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.154500	Live	47.0	65.8	18.8	Complied
0.181500	Live	42.9	64.4	21.5	Complied
0.429000	Live	38.0	57.3	19.3	Complied
0.433500	Live	37.1	57.2	20.1	Complied
22.240500	Live	28.9	60.0	31.1	Complied
24.342000	Live	31.4	60.0	28.6	Complied

**Results: Live/Average**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.154500	Live	30.8	55.8	25.0	Complied
0.159000	Live	31.8	55.5	23.7	Complied
0.267000	Live	23.1	51.2	28.1	Complied
0.429000	Live	30.3	47.3	17.0	Complied
22.218000	Live	25.0	50.0	25.0	Complied
24.792000	Live	25.6	50.0	24.4	Complied

**Transmitter AC Conducted Spurious Emissions (continued)****Results: Neutral/Quasi Peak**

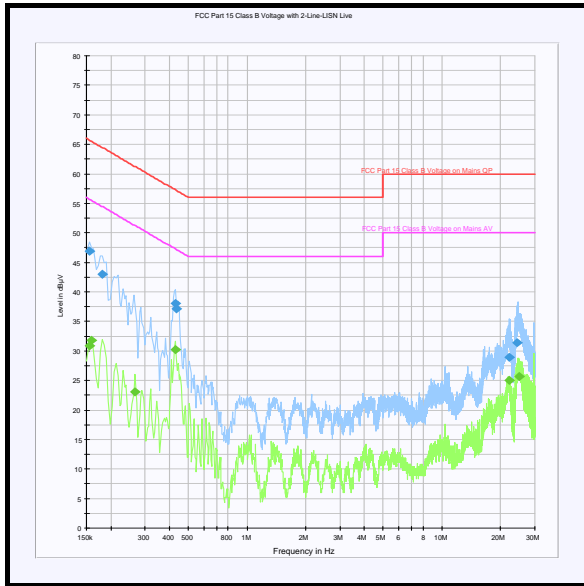
Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.154500	Neutral	46.3	65.8	19.5	Complied
0.159000	Neutral	46.3	65.5	19.2	Complied
0.163500	Neutral	43.8	65.3	21.5	Complied
0.186000	Neutral	42.3	64.2	21.9	Complied
0.424500	Neutral	34.6	57.4	22.8	Complied
0.429000	Neutral	35.3	57.3	22.0	Complied
10.333500	Neutral	16.2	60.0	43.8	Complied
16.129500	Neutral	21.8	60.0	38.2	Complied
25.246500	Neutral	28.9	60.0	31.1	Complied

**Results: Neutral/Average**

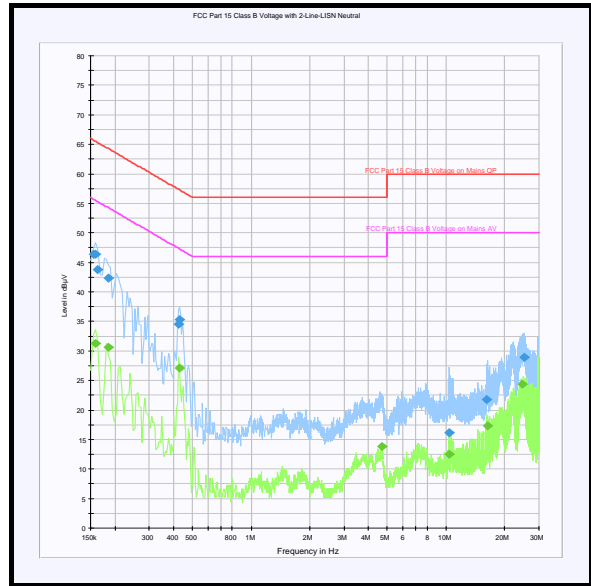
Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.159000	Neutral	31.3	55.5	24.2	Complied
0.186000	Neutral	30.6	54.2	23.6	Complied
0.429000	Neutral	27.1	47.3	20.2	Complied
4.672500	Neutral	13.8	46.0	32.2	Complied
10.329000	Neutral	12.5	50.0	37.5	Complied
16.363500	Neutral	17.3	50.0	32.7	Complied
24.544500	Neutral	24.3	50.0	25.7	Complied

**Transmitter AC Conducted Spurious Emissions (continued)**

**Live**



**Neutral**



*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

**5.2.2. Transmitter Fundamental Field Strength**

**Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	11 June 2011
<b>Test Sample Serial No:</b>	Not Stated		

<b>FCC Part:</b>	15.209
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.4

**Environmental Conditions:**

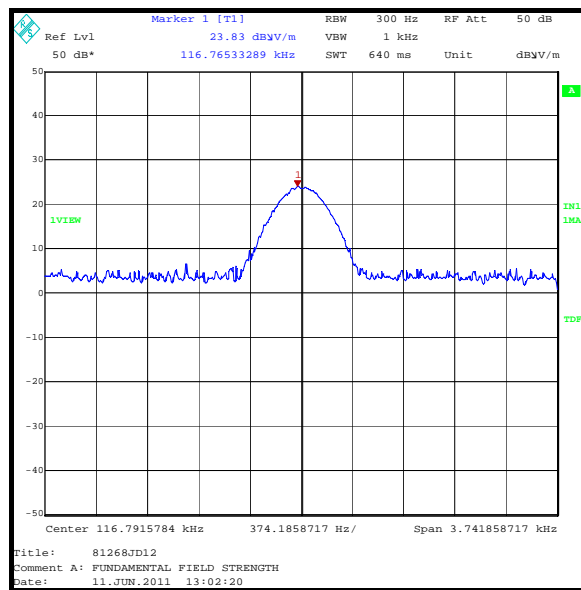
<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	22

**Results: Quasi Peak**

Frequency (kHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit at 30 m (dB $\mu$ V/m)	Margin (dB)	Result
116.765	90° to EUT	23.8	84.0	60.2	Complied

**Note(s):**

1. The limit is specified at a test distance of 30 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres. A distance extrapolation factor of 40 dB was used.



**5.2.3. Transmitter Radiated Spurious Emissions****Test Summary:**

<b>Test Engineer:</b>	Andre Edwards	<b>Test Date:</b>	11 June 2011
<b>Test Sample Serial No:</b>	Not Stated		

<b>FCC Part:</b>	15.209
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.3 and 6.5 referencing ANSI C63.4
<b>Frequency Range:</b>	30 MHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	28
<b>Relative Humidity (%):</b>	22

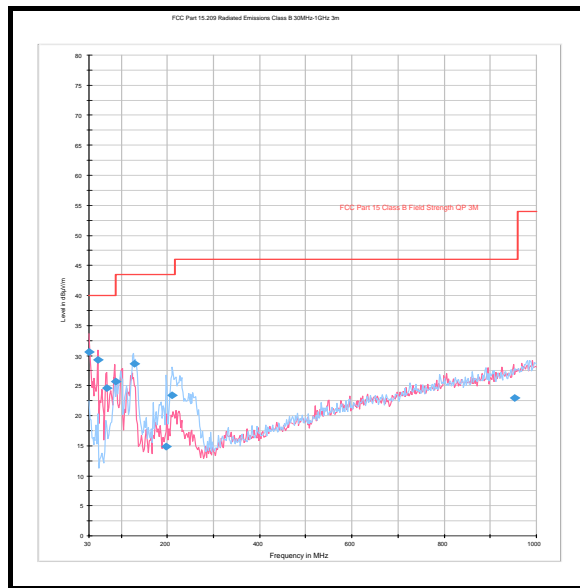
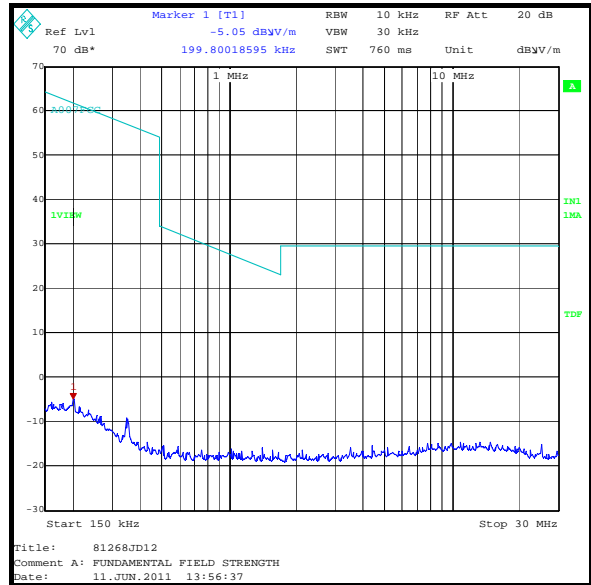
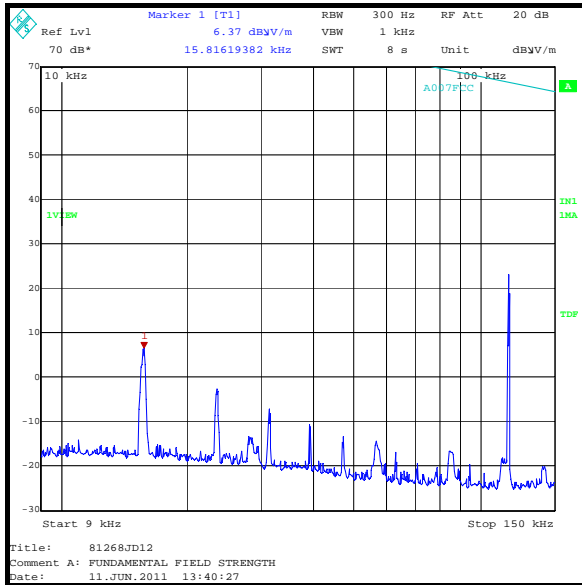
**Results: Quasi Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
30.687	Vertical	30.6	40.0	9.4	Complied
49.251	Vertical	29.3	40.0	10.7	Complied
67.824	Vertical	24.6	40.0	15.4	Complied
86.945	Vertical	25.7	40.0	14.3	Complied
127.930	Horizontal	28.6	43.5	14.9	Complied
195.967	Horizontal	14.8	43.5	28.7	Complied
210.305	Horizontal	23.4	43.5	20.1	Complied
951.860	Vertical	23.0	46.0	23.0	Complied

**Note(s):**

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
4. Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
5. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.
6. The emission shown at approximately 117 kHz is the fundamental.

### Transmitter Radiated Spurious Emissions (continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

**5.2.4. Transmitter 20 dB Bandwidth**

**Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	11 June 2011
<b>Test Sample Serial No:</b>	Not Stated		

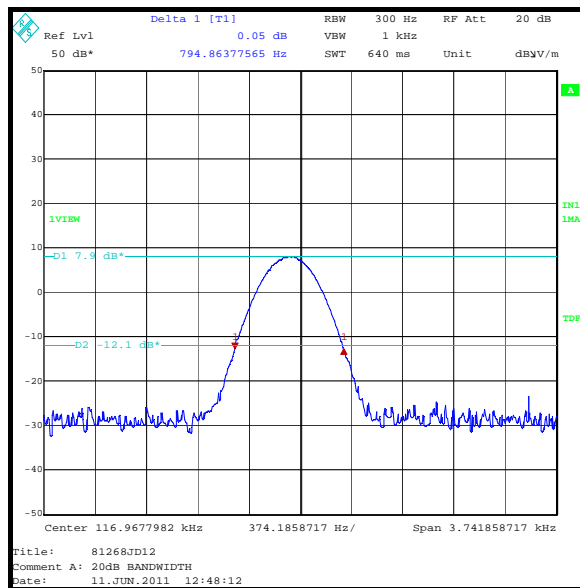
<b>FCC Part:</b>	2.1049
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.9.1

**Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	22

**Results:**

<b>20 dB Bandwidth (Hz)</b>
787



## **6. Measurement Uncertainty**

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level (%)</b>	<b>Calculated Uncertainty</b>
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
20 dB Bandwidth	117 kHz	95%	±0.92 ppm
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	±3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.



**Appendix 1. Test Equipment Used**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Jun 2011	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	05 Apr 2012	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12
M1568	Antenna	Rohde & Schwarz	HFH2-Z2	879284/2	27 Jan 2012	12

**NB** In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.