



DATE: 24 November 2016

**I.T.L. (PRODUCT TESTING) LTD.
FCC Radio Test Report**

For

Orpak Systems Ltd.

Equipment under test:

Outdoor Payment Terminal

**OrPAY1000
(13.56 MHz Transceiver)**

Tested by:



M. Zohar

Approved by:



D. Shidlovsky

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This report relates only to items tested.



Measurement/Technical Report for Orpak Systems Ltd.

Outdoor Payment Terminal

OrPAY1000

FCC ID: W8F800927850

This report concerns: Original Grant: X
 Class I Change:
 Class II Change:

Equipment type: DCD - Part 15 Low Power Transmitter Below
 1705 kHz

Limits used: 47CFR15 Section 15.225

Measurement procedure used is ANSI C.63.10 2013

Application for Certification
prepared by:
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TABLE OF CONTENTS

1. GENERAL INFORMATION	4
1.1 Administrative Information	4
1.2 List of Accreditations	5
1.3 Product Description	6
1.4 Test Methodology	6
1.5 Test Facility	6
1.6 Measurement Uncertainty	6
2. SYSTEM TEST CONFIGURATION	7
2.1 Justification	7
2.2 EUT Exercise Software	7
2.3 Special Accessories	7
2.4 Equipment Modifications	7
2.5 Configuration of Tested System	7
3. CONDUCTED & RADIATED MEASUREMENT TEST SET-UP PHOTOS	8
4. CONDUCTED EMISSION FROM AC MAINS	10
4.1 Test Specification	10
4.2 Test Procedure	10
4.3 Test Limit	10
4.4 Test Results	11
4.5 Test Equipment Used; Conducted Emission	16
5. FIELD STRENGTH OF FUNDAMENTAL	17
5.1 Test Specification	17
5.2 Test Procedure	17
5.3 Test Limit	17
5.4 Test Results	18
5.5 Test Instrumentation Used; Field Strength of Fundamental	20
6. RADIATED EMISSION, 9 KHZ – 200 MHZ	21
6.1 Test Specification	21
6.2 Test Procedure	21
6.3 Test Limit	21
6.4 Test Results	22
6.5 Test Instrumentation Used; Radiated Measurements	24
6.6 Field Strength Calculation	24
7. OCCUPIED BANDWIDTH	25
7.1 Test Specification	25
7.2 Test Procedure	25
7.3 Test Limit	25
7.4 Test Results	25
7.5 Test Equipment Used; Bandwidth	26
8. FREQUENCY STABILITY	27
8.1 Test Specification	27
8.2 Test Procedure	27
8.3 Test Limit	27
8.4 Test Results	27
8.5 Test Instruments Used; Frequency Stability	28
9. APPENDIX B - CORRECTION FACTORS	29
9.1 Correction factors for for RF OATS Cable 35m	29
9.2 Correction factors for RF OATS Cable 10m	30
9.3 Correction factors for for RF CABLE for Semi Anechoic Chamber	31
9.4 Correction factors for Biconical Antenna	32
9.5 Correction factors for ACTIVE LOOP ANTENNA	33



1. General Information

1.1 Administrative Information

Manufacturer: Orpak Systems Ltd.

Manufacturer's Address: 31 Lechi St.
P.O.B. 1461
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Israel
Tel: +972-3-577-6868
Fax: +972-3-579-6310

Manufacturer's Representative: Haim Aharon

Equipment Under Test (E.U.T): Outdoor Payment Terminal

Equipment Model No.: OrPAY1000

Equipment Part No.: 1021266

Date of Receipt of E.U.T: 07.08.2016

Start of Test: 07.08.2016

End of Test: 18.08.2016

Test Laboratory Location: I.T.L (Product Testing) Ltd.
1 Batsheva St.,
Lod
ISRAEL 7120101

Test Specifications: FCC Part 15 Subpart C, Section 15.225



1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), FCC Designation No. IL1005.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-3006, R-2729, T-1877, G-245.
5. Industry Canada (Canada), IC File No.: 46405-4025; Sites No. IC 4025A-1, 4025A-2.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.



1.3 **Product Description**

The OrPAY 1000 is a cost-effective outdoor payment terminal installed directly onto the dispenser or wall mounted next to it for both attended and unattended activities.

The terminal's unique features have been designed to suit both retail and commercial fleet markets as an impeccable pay-at-the-pump solution for fuel card purchases, forecourt promotions, local accounts, loyalty schemes, attendant management, and much more.

In addition, OrPAY1000 has a built-in 'pump interface', allowing it to control the dispenser as well as interface directly with Orpak's forecourt controller over LAN, eliminating the need for dedicated pump interface hardware.

The OrPAY 1000 terminal is small enough to fit in any standard pump head or pedestal, yet provides an efficient and advanced user interface with its 4.3" multimedia color LCD display, 4 addressable screen keys, and a full alphanumeric vandal proof 40-key keyboard. Furthermore, the novel terminal can be part of Orpak's ForeFuel solution with its built-in WGT (Wireless Gateway).

Model name	Orpay 1000
Working voltage	12.0-24.0V DC via AC/DC adapter Manufactory: mean well Order num: GS40A24-P1j s/n : EB58E77878
Mode of operation	Transceiver
Assigned Frequency Range	13.110-14.010 MHz
Operation Frequency Range	13.56MHz

1.4 **Test Methodology**

Radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 **Test Facility**

Emissions tests were performed at I.T.L.'s testing facility in Lod, Israel. I.T.L.'s EMC Laboratory is accredited by A2LA, certificate No. 1152.01 and FCC Designation No. IL1005.

1.6 **Measurement Uncertainty**

Conducted Emission

Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4)

0.15 – 30 MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 3.44 dB

Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

± 4.98 dB

2. System Test Configuration

2.1 *Justification*

The E.U.T was transmitting continuously at 13.56MHz with modulation while in installation position as defined by customer.

2.2 *EUT Exercise Software*

No special exercise software was needed.

2.3 *Special Accessories*

No accessories were used.

2.4 *Equipment Modifications*

No modifications were needed in order to achieve compliance.

2.5 *Configuration of Tested System*

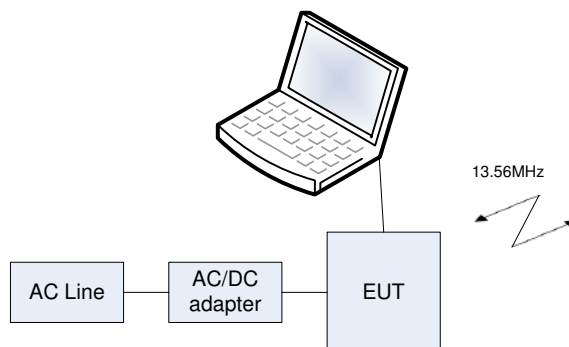


Figure 1. Configuration of Tested System

3. Conducted & Radiated Measurement Test Set-Up Photos



Figure 2. Conducted Emission Test



Figure 3. Frequency Stability

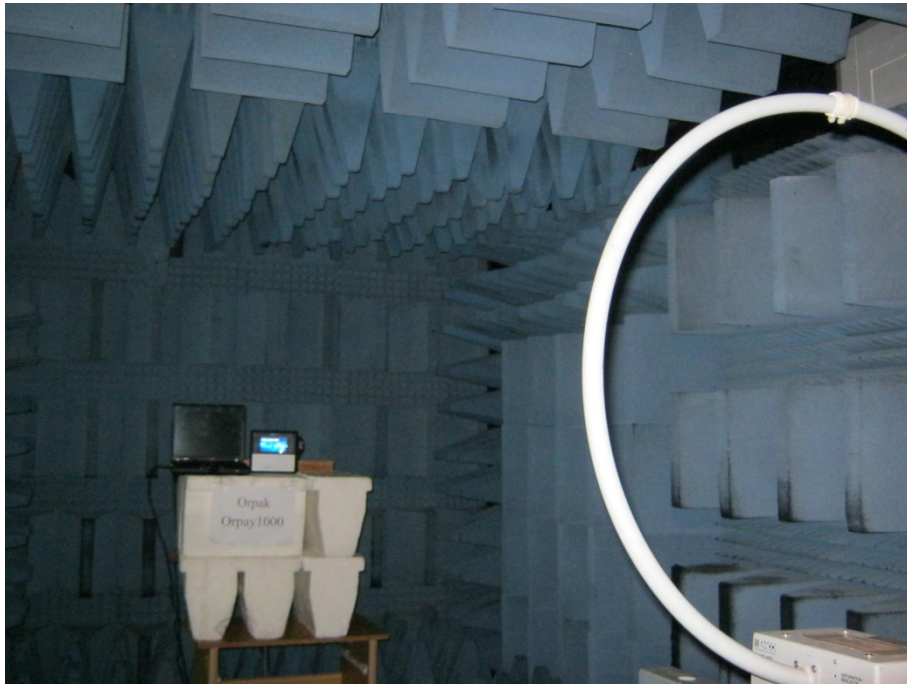


Figure 4. Field Strength of Fundamental



Figure 5. Radiated Emission 30MHz-200MHz

4. Conducted Emission From AC Mains

4.1 Test Specification

FCC Part 15, Subpart C, Section 15.207

4.2 Test Procedure

(Temperature (22°C)/ Humidity (60%RH))

The E.U.T operation mode and test setup are as described in Section 2 of this report. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on a 0.8 meter high wooden table, 0.4 meter from the room's vertical wall. In the case of a floor-standing E.U.T., it was placed on the horizontal ground plane.

The E.U.T was powered from 115 V AC / 60 Hz via 50 Ohm / 50 μ Hn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T.'s AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in the photograph, *Figure 2. Conducted Emission Test.*

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver and are displayed on the receiver's spectrum display.

The E.U.T was tested while transmitting simultaneously at ZIGBEE, 125 kHz and 13.56 MHz.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

4.3 Test Limit

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66.0 to 56.0*	56.0 to 46.0*
0.5-5.0	56.0	46.0
5.0-30.0	60.0	50.0

* Decreases with the logarithm of the frequency.



4.4 Test Results

JUDGEMENT: Passed by 2.76 dB

The margin between the emission levels and the specification limit is, in the worst case, 2.8 dB for the phase line at 0.41 MHz and 3.8 dB at 0.41 MHz for the neutral line.

The EUT met the F.C.C. Part 15, Subpart C specification requirements.

The details of the highest emissions are given in *Figure 6* to *Figure 9*.



Conducted Emission

E.U.T Description Outdoor Payment Terminal
Type OrPAY1000
Serial Number: 1021266

Specification: FCC Part 15, Subpart C
Lead: Phase
Detectors: : Quasi-peak, Average

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CE22BQP			
Trace2:	CE22BAP			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV	DELTA	LIMIT dB
2 Average	206 kHz	44.40	-8.95	
1 Quasi Peak	210 kHz	52.44	-10.76	
1 Quasi Peak	410 kHz	54.88	-2.76	
2 Average	410 kHz	43.09	-4.55	
1 Quasi Peak	450 kHz	49.74	-7.13	
2 Average	454 kHz	35.50	-11.30	
2 Average	1.13 MHz	29.69	-16.30	
1 Quasi Peak	1.146 MHz	40.79	-15.20	
1 Quasi Peak	1.554 MHz	39.13	-16.86	
2 Average	1.666 MHz	28.93	-17.06	
2 Average	2.178 MHz	26.10	-19.89	
1 Quasi Peak	2.878 MHz	30.83	-25.16	
1 Quasi Peak	4.13 MHz	30.00	-25.99	
2 Average	4.182 MHz	25.84	-20.15	
2 Average	10.322 MHz	26.54	-23.45	
1 Quasi Peak	10.358 MHz	30.16	-29.83	
1 Quasi Peak	13.57 MHz	32.22	-27.77	
2 Average	13.57 MHz	27.10	-22.89	
2 Average	17.682 MHz	25.95	-24.04	
1 Quasi Peak	18.55 MHz	29.13	-30.86	

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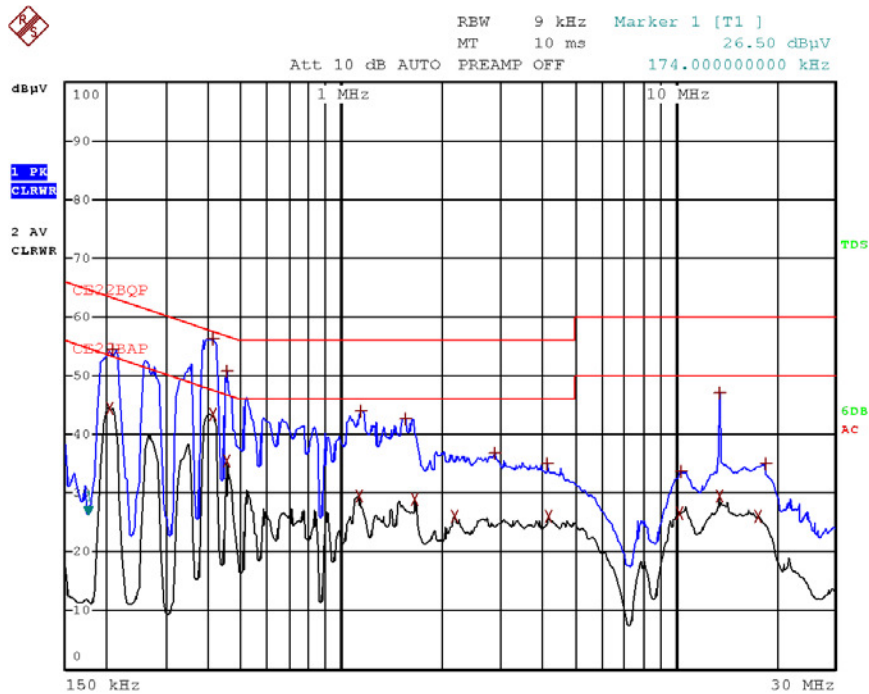
Figure 6. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description Outdoor Payment Terminal
 Type OrPAY1000
 Serial Number: 1021266

Specification: FCC Part 15, Subpart C
 Lead: Phase
 Detectors: Peak, Average



Date: 11.AUG.2016 15:24:13

Figure 7. Detectors: Peak, Quasi-peak, Average



Conducted Emission

E.U.T Description Outdoor Payment Terminal
Type OrPAY1000
Serial Number: 1021266

Specification: FCC Part 15, Subpart C
Lead: Neutral
Detectors: Quasi-peak, Average

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CE22BQP			
Trace2:	CE22BAP			
Trace3:	---			
	TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
2	Average	202 kHz	43.66	-9.86
1	Quasi Peak	214 kHz	50.58	-12.46
2	Average	394 kHz	42.48	-5.49
1	Quasi Peak	410 kHz	53.88	-3.75
1	Quasi Peak	450 kHz	48.80	-8.07
2	Average	454 kHz	34.58	-12.22
2	Average	1.13 MHz	28.61	-17.38
1	Quasi Peak	1.162 MHz	39.92	-16.07
1	Quasi Peak	1.554 MHz	38.05	-17.94
2	Average	1.666 MHz	27.79	-18.21
2	Average	2.178 MHz	25.20	-20.79
1	Quasi Peak	2.338 MHz	32.25	-23.75
1	Quasi Peak	4.126 MHz	30.44	-25.55
2	Average	4.25 MHz	25.47	-20.53
2	Average	10.354 MHz	26.98	-23.01
1	Quasi Peak	10.394 MHz	30.88	-29.11
1	Quasi Peak	13.566 MHz	44.56	-15.43
2	Average	13.566 MHz	30.38	-19.61
2	Average	17.746 MHz	26.22	-23.77
1	Quasi Peak	18.342 MHz	30.49	-29.51

Date: 11.AUG.2016 15:20:22

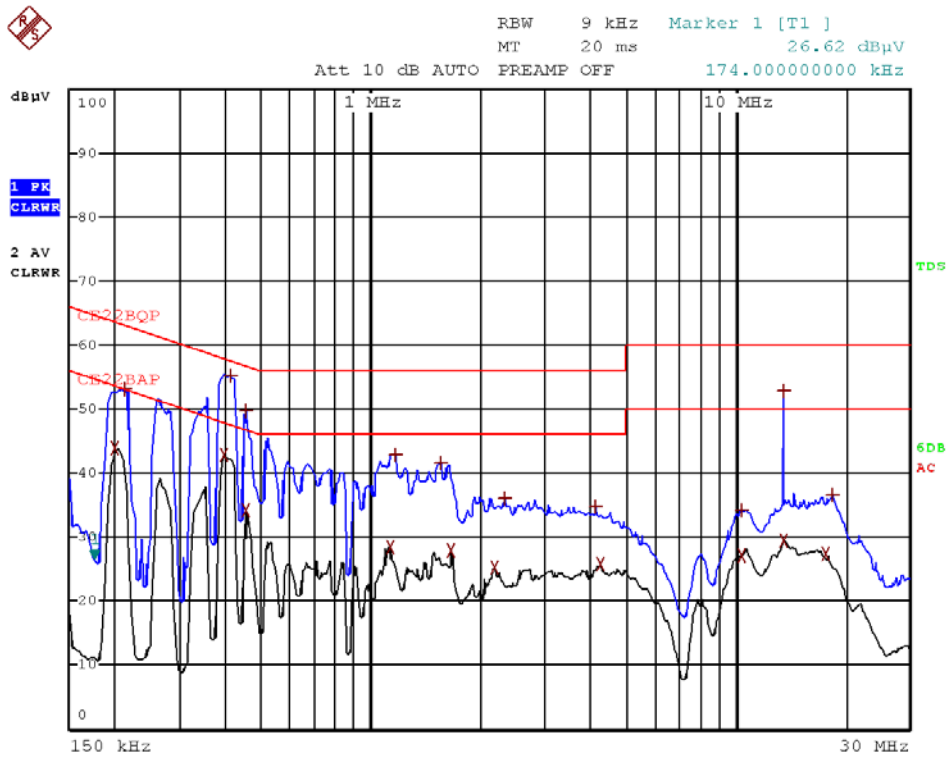
Figure 8. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description Outdoor Payment Terminal
 Type OrPAY1000
 Serial Number: 1021266

Specification: FCC Part 15, Subpart C
 Lead: Neutral
 Detectors: Peak, Average



Date: 11.AUG.2016 15:18:49

Figure 9 Detectors: Peak, Quasi-peak, Average



4.5 Test Equipment Used; Conducted Emission

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
LISN	Fischer	FCC-LISN-25A	127	June 23, 2016	June 23, 2017
Transient Limiter	HP	11947A	3107A03041	June 15, 2016	June 15, 2017
EMI Receiver	Rohde & Schwarz	ESCI7	100724	February 29, 2016	March 1, 2017

Figure 10 Test Equipment Used

5. Field Strength of Fundamental

5.1 Test Specification

Part 15, Subpart C, Section 15.225(a-c)

5.2 Test Procedure

(Temperature (24°C)/ Humidity (58%RH))

The E.U.T. operation mode and test set-up are as described in Section 2 of this report.

The E.U.T. was placed in the chamber on a non-conductive table, 1.5 meters above the ground.

The EMI receiver was set to the E.U.T. Fundamental Frequency and Peak Detection.

The distance between the E.U.T. and test antenna was 3 meters.

The turntable and antenna were adjusted for maximum level reading on the EMI receiver.

5.3 Test Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency band	Field strength	Measurement distance	Field strength @30m	Field strength @3m*
(MHz)	(microvolts/meter)	(meters)	(dBμV/m)	(dBμV/m)
13.553-13.567	15,848.0	30	84.0	124.0
13.410-13.553	334.0	30	50.4	90.4
13.567-13.710				
13.110-13.410	106.0	30	40.5	80.5
13.710-14.010				
Up to 13.110	According 15.209			
From 14.010				

* Field strength @3m =40 log(30m/3m)=40



5.4 Test Results

Frequency	Polarity	Peak Reading	Lowest Mask Limit	Margin
(MHz)	(V/H)	(dB μ V/m)	(dB μ V/m)	(dB)
13.56	V	66.5	80.5	-14.0
13.56	H	74.8	80.5	-5.7

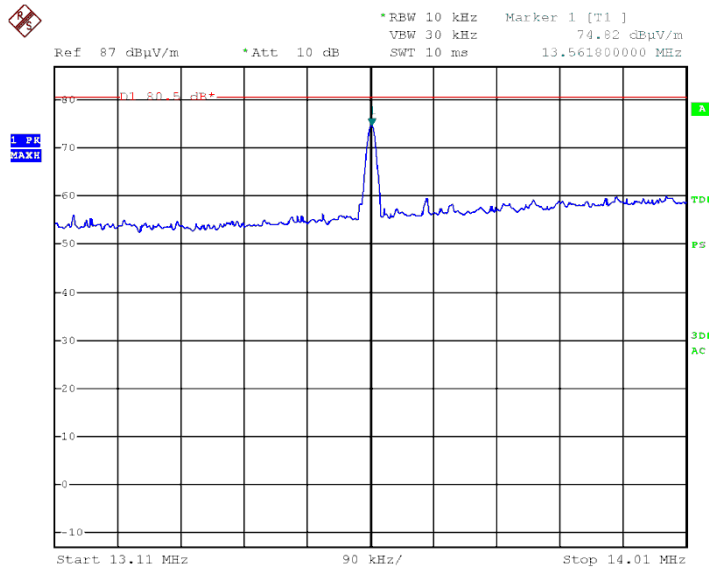
The EUT met the FCC Part 15, Subpart C, Section 15.209 requirements.

JUDGEMENT: Passed by 5.7dB

The details of the highest emissions are given in *Figure 11* to *Figure 12*.

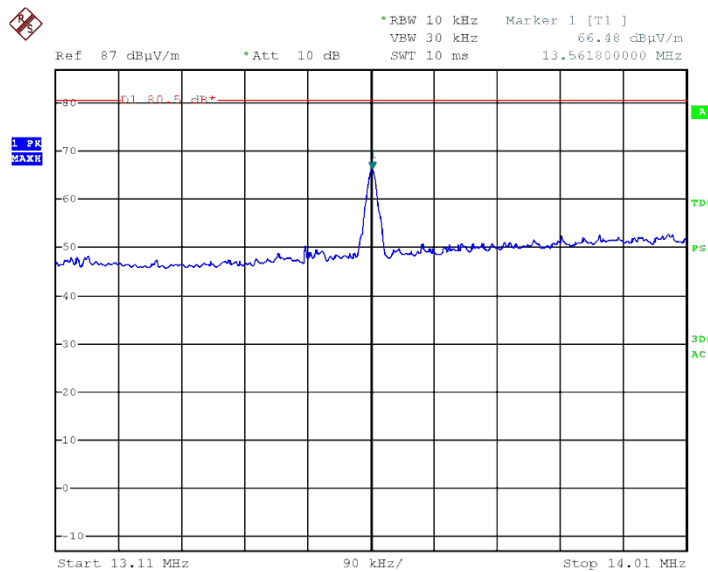
Field Strength of Fundamental

E.U.T Description Outdoor Payment Terminal
 Model Number OrPAY1000
 Part Number: 1021266



Date: 9.AUG.2016 09:18:52

Figure 11. Field Strength of Fundamental, Horizontal



Date: 9.AUG.2016 09:11:52

Figure 12. Field Strength of Fundamental, Vertical



5.5 Test Instrumentation Used; Field Strength of Fundamental

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 29, 2016	March 1, 2017
Loop Antenna	EMCO	6502	2950	November 5, 2015	November 30, 2016
Semi Anechoic Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 13. Test Equipment Used

6. Radiated Emission, 9 kHz – 200 MHz

6.1 Test Specification

Part 15, Subpart C, Sections 225(d), 209(a)

6.2 Test Procedure

(Temperature (29°C)/ Humidity (56%RH))

The E.U.T. operation mode and test set-up are as described in Section 2 of this report.

For measurements between 0.009MHz-30.0MHz:

The E.U.T was tested inside the shielded room at a distance of 3 meters and the E.U.T was placed on a non-metallic table, 1.5 meters above the ground. The frequency range 0.009MHz-30MHz was scanned. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.

The emissions were measured at a distance of 3 meters.

For measurements between 30.0MHz-200.0MHz:

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

The emissions were measured at a distance of 3 meters

6.3 Test Limit

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	Field strength* (dBµV/m)	Field strength* (dBµV/m)@3m
0.009-0.490	2400/F(kHz)	300	48.5-13.8	128.5-73.8
0.490-1.705	24000/F(kHz)	30	33.8-23.0	73.8-63.0
1.705-30.0	30	30	29.5	69.5
30-88	100	3	40.0	40.0
88-216	150	3	43.5	43.5
216-960	200	3	46.0	46.0
Above 960	500	3	54.0	54.0

*The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.



6.4 Test Results

JUDGEMENT: Passed by 2.2 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 209 specification.

See additional information in *Figure 14*.



Radiated Emission 9 kHz – 200 MHz

E.U.T Description Outdoor Payment Terminal
Model Number OrPAY1000
Part Number: 1021266

Specification: FCC, Part 15, Subpart C;

Antenna Polarization: Horizontal/Vertical Frequency range: 9 kHz to 200.0 MHz
Test Distance: 3 meters Detector: Peak, Quasi-peak
Operation Frequencies: 13.56MHz

Frequency (MHz)	Polarity (V/H)	Peak (dB μ V/m)	Q.P. (dB μ V/m)	Specification (dB μ V/m)	Margin (dB)
27.12	V	40.6	-	69.5	-28.9
	H	48.8	-	69.5	-20.7
40.68	V	42.2	37.8	40.0	-2.2
	H	25.9	-	40.0	-14.1
67.80	V	39.5	31.9	40.0	-8.1
	H	28.2	-	40.0	-11.8
108.48	V	30.5	-	43.5	-13.0
	H	33.6	-	43.5	-9.9
122.04	V	32.9	-	43.5	-10.6
	H	38.2	-	43.5	-5.3

Figure 14. Radiated Emission

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.



6.5 Test Instrumentation Used; Radiated Measurements

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 29, 2016	March 1, 2017
EMI Receiver	HP	8542E	3906A00276	March 3, 2016	March 3, 2017
RF Filter Section	HP	85420E	3705A00248	March 3, 2016	March 3, 2017
Active Loop Antenna	EMCO	6502	9506-2950	November 5, 2015	November 5, 2016
Biconical Antenna	EMCO	3110B	9912-3337	March 24, 2016	March 24, 2018

Figure 15. Test Equipment Used

6.6 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

- FS: Field Strength [dB μ v/m]
- RA: Receiver Amplitude [dB μ v]
- AF: Receiving Antenna Correction Factor [dB/m]
- CF: Cable Attenuation Factor [dB]

Example: FS = 30.7 dB μ V (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dB μ V

No external pre-amplifiers are used.

7. Occupied Bandwidth

7.1 Test Specification

Part 2, Section 2.1049

7.2 Test Procedure

(Temperature (22°C)/ Humidity (60%RH))

The EUT was set up as shown in *Figure 1*.

The transmitter unit was operated with normal modulation. The spectrum analyzer span was set to ~ 3 times the OBW. The spectrum bandwidth of the transmitter unit was measured and recorded. The BW was measured at 26dBc points.

7.3 Test Limit

N/A

7.4 Test Results

FREQUENCY	READING
(MHz)	(kHz)
13.56	29.54

Figure 16. Bandwidth Test Results

JUDGEMENT: Passed

See additional information in *Figure 17*.

Occupied Bandwidth

E.U.T Description Outdoor Payment Terminal
 Model Number OrPAY1000
 Part Number: 1021266

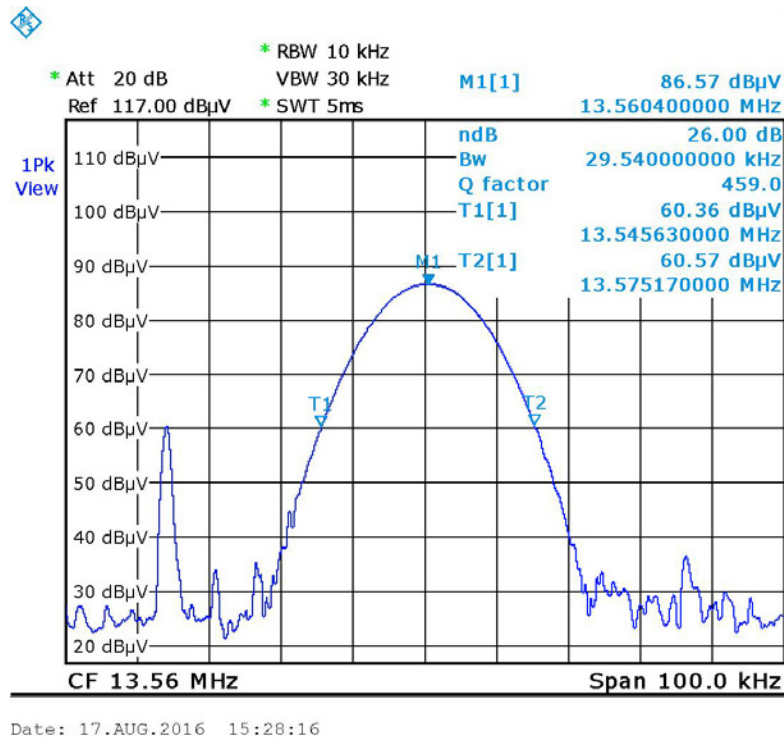


Figure 17 26dB Bandwidth

7.5 Test Equipment Used; Bandwidth

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	R&S	FSL6	100194	February 29, 2016	March 1, 2017
Loop Antenna	EMCO	6502	2950	November 5, 2015	November 30, 2016
Semi Anechoic Chamber	ETS	S81	SL 11643	NCR	NCR

Figure 18 Test Equipment Used

8. Frequency Stability

8.1 Test Specification

Part 15, Subpart C, Sections 225(e)

8.2 Test Procedure

(Temperature (23°C)/ Humidity (52%RH))

The E.U.T operation mode and test setup are as described in Section 2.

The E.U.T. was placed inside a temperature chamber. The power to the AC/DC adapter was supplied by a variac .The E.U.T. was operated from 132.2VAC, 115.0VAC and 97.7VAC at normal temperature and the chamber temperature was set to +25°C.

The spectrum analyzer was set to 10.0 kHz span and 1.0 kHz RBW, and 1.0 kHz VBW, counter function was set on.

The carrier frequency was measured and recorded (reference frequency reading).

The carrier frequency measurement was repeated for:

- (b). -20°C and 115 VAC
- (c). -10°C and 115 VAC
- (d). 0°C and 115 VAC
- (e). +10°C and 115 VAC
- (f). +20°C and 115 VAC
- (g). +40°C and 115 VAC
- (h). +50°C and 115 VAC

The carrier frequency was measured and recorded after at least 20 minutes of exposing the E.U.T. to the temperature.

8.3 Test Limit

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency: $0.01 * (13.56\text{M}/100) = \pm 1356\text{Hz}$

8.4 Test Results

The E.U.T met the requirements of Part 27 Sub-part C, Section 27.54 specification.

The details of the results are given in *Figure 19*.



Frequency Stability

E.U.T Description Outdoor Payment Terminal
Type OrPAY1000
Part Number: 1021266

Specification: FCC Partb15 Sub-part C Section 225(e)

Temperature	Voltage	Frequency	Drift
(°C)	(VAC)	(kHz)	(kHz)
+25.0	97.7	13,560.8	+0.3
	115.0	13,560.5	-
	132.2	13,560.9	+0.4
-20.0	115.0	13,560.4	-0.1
-10.0	115.0	13,560.4	-0.1
0.0	115.0	13,560.5	0.0
+10.0	115.0	13,560.5	0.0
+20.0	115.0	13,560.5	0.0
+40.0	115.0	13,560.3	-0.2
+50.0	115.0	13,560.3	-0.2

Figure 19 Frequency Stability Results

8.5 Test Instruments Used; Frequency Stability

Instrument	Manufacturer	Model	Serial Number	Calibration	
				Last Calibration Date	Next Calibration Due
Spectrum Analyzer	R&S	FSL6	100194	February 29, 2016	March 1, 2017
Environmental Chamber	THERMOTRON CORP	SM 32C Mini Max	25-1030	N/A	N/A
Variable Voltage Transformer	Variac Voltage Co.	-	-	N/A	N/A

Table 1 Test Instruments Used Frequency Stability



9. APPENDIX B - CORRECTION FACTORS

9.1 Correction factors for for RF OATS Cable 35m ITL #1784

Frequency (MHz)	Cable loss (dB)
10.0	0.3
20.0	0.2
50.0	-0.1
100.0	-0.6
200.0	-1.2
500.0	-2.3
1000.0	-3.6



**9.2 Correction factors for RF OATS Cable 10m
ITL #1794**

Frequency(MHz)	Cable loss(dB)
10.0	-0.3
20.0	-0.3
50.0	-0.5
100.0	-0.7
200.0	-1.1
500.0	-1.8
1000.0	-2.7



9.3 Correction factors for for RF CABLE for Semi Anechoic Chamber

ITL # 1841

FREQ (MHz)	LOSS (dB)
1000.0	1.5
2000.0	2.1
3000.0	2.7
4000.0	3.1
5000.0	3.5
6000.0	4.1
7000.0	4.6
8000.0	4.9
9000.0	5.7
10000.0	5.7
11000.0	6.1
12000.0	6.1
13000.0	6.2
14000.0	6.7
15000.0	7.4
16000.0	7.5
17000.0	7.9
18000.0	8.1
19000.0	8.8
20000.0	9.1



9.4 Correction factors for Biconical Antenna
EMCO, Model 3110B,
Serial #9912-3337

Frequency [MHz]	AF [dB/m]
30.0	14.18
35.0	13.95
40.0	12.84
45.0	11.23
50.0	11.10
60.0	10.39
70.0	9.34
80.0	9.02
90.0	9.31
100.0	8.95
120.0	11.53
140.0	12.20
160.0	12.56
180.0	13.49
200.0	15.27



9.5 Correction factors for ACTIVE LOOP ANTENNA

**Model 6502
S/N 9506-2950**

f(MHz)	MAF(dBs/m)	AF(dB/m)
0.01	-33.1	18.4
0.02	-37.2	14.3
0.03	-38.2	13.3
0.05	-39.8	11.7
0.1	-40.1	11.4
0.2	-40.3	11.2
0.3	-40.3	11.2
0.5	-40.3	11.2
0.7	-40.3	11.2
1	-40.1	11.4
2	-40	11.5
3	-40	11.5
4	-40.1	11.4
5	-40.2	11.3
6	-40.4	11.1
7	-40.4	11.1
8	-40.4	11.1
9	-40.5	11
10	-40.5	11
20	-41.5	10
30	-43.5	8