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DATE: 25 February 2013

I.T.L. (PRODUCT TESTING) LTD.

Canadian EMC Test Report

for

Pointer Telocation Ltd.

Equipment under test:

Asset Tracking Device

CelloTrack3G Power P/N GT9740001-000, CelloTrack3G LighterP/N GT9740005-000*;
CelloTrack3G IP67 P/N GT9740012-000*;
CelloTrack3G Power 6M P/N GT9740021-000*;CelloTrack3G 6M P/N GT9740022-000*;
CelloTrack3G Lighter 6M P/N GT9740023-000*;
CelloTrack3G XT P/N GT9740025-000*; CelloTrack3G Power XT P/N GT9740026-000*

* See customer's declaration on page 4.

Written by: _____
Y. Raz, Documentation

Approved by: _____
D. Yadidi, Test Engineer

Approved by: _____
I. Raz, EMC Laboratory Manager

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1. General Information

1.1 Administrative Information

Manufacturer:	Pointer Telocation Ltd.
Manufacturer's Address:	14 Hamelacha St., Rosh Ha'ayin, 48091 Israel Tel: +972-3-572-3111 Fax: +972-3-572-3100
Manufacturer's Representative:	Itamar Gohary
Equipment Under Test (E.U.T):	Asset Tracking Device
Equipment Model No.:	CelloTrack3G Power P/N GT9740001-000**,** CelloTrack3G Lighter P/N GT9740005-000*; CelloTrack3G IP67 P/N GT9740012-000*; CelloTrack3G Power 6M P/N GT9740021-000*; CelloTrack3G 6M P/N GT9740022-000*; CelloTrack3G Lighter 6M P/N GT9740023-000*; CelloTrack3G XT P/N GT9740025-000*; CelloTrack3G Power XT P/N GT9740026-000*
Equipment Serial No.:	Not designated
Date of Receipt of E.U.T:	05.12.2012
Start of Test:	05.12.2012
End of Test:	10.12.2012
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 71100
Test Specifications:	See Section 2

* See customer's declaration on following page.

POINTER

Cellocator Division
Pointer Telocation Ltd.

Date: 26 December 2012

Declaration

I hereby declare that the **CelloTrack3G Power P/N GT9740001-000** is a full configuration model. The below model's:

Product Name:	*Part Number:*
CelloTrack3G Lighter	GT9740005-000
CelloTrack3G IP67	GT9740012-000
CelloTrack3G Power 6M	GT9740021-000
CelloTrack3G 6M	GT9740022-000
CelloTrack3G XT	GT9740025-000
Cellotrack3G Power XT)	GT9740026-000

differs from the **CelloTrack3G Power P/N GT9740001-000** only by diffrent Internal battery type\removal of battery charger components\External Harness connection. Please relate to all models (from an EMC/Radio point of view) as the same product.

Thank you,
Signature: _____

Pointer Telocation

Itamar Gohary
Certification Manager
Pointer Telocation Ltd.

Pointer Telocation Ltd. 14 Hamelacha St., Rosh Ha'ayin 48091, Israel • Tel: 972-3-5723111 • Fax: 972-3-5723100 • www.pointer.com

1.2 Abbreviations and Symbols

The following abbreviations and symbols are applicable to this test report:

AC	alternating current
ARA	Antenna Research Associates
Aux	auxiliary
Avg	average
CDN	coupling-decoupling network
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dbµV	decibel referred to one microvolt
dbµV/m	decibel referred to one microvolt per meter
DC	direct current
EMC	electromagnetic compatibility
E.U.T.	equipment under test
GHz	gigahertz
HP	Hewlett Packard
Hz	Hertz
kHz	kilohertz
kV	kilovolt
LED	light emitting diode
LISN	line impedance stabilization network
m	meter
mHn	millihenry
MHz	megahertz
msec	millisecond
N/A	not applicable
QP	quasi-peak
PC	personal computer
RF	radio frequency
RE	radiated emission
sec	second
V	volt

1.3 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.), Registration No. 861911.
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; Site No. IC 4025A-1.
6. TUV Product Services, England, ASLLAS No. 97201.

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.

2. Applicable Documents

2.1	**ICES-003, Issue 5; 2012**	*Spectrum Management and Telecommunications Interference-Causing Equipment Standard Information Technology Equipment (ITE) – Limits and methods of measurement*
2.2	**CAN/CSA-CEI/IEC CISPR 22: 10**	*Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement*

3. Test Site Description

3.1 Location:

The Electromagnetic Compatibility Test Facility of I.T.L. (Product testing) Ltd. Is located at
Telrad Industrial Park, Lod, 71100 Israel.
Telephone: +972-8-9153100
Fax: +972-8-9153101

3.2 Open Site:

The OATS is located on a one floor-building roof. The OATS consists of 3 meter and 10 meter ranges, using a 21.5m X 8.5m solid metal ground plane, a remote controlled turntable and an antenna mast.

3.3 Ground Plane:

The ground plane is made from steel plates, which are welded continuously together. The Ground plane is lies and welded on welded steel construction with vias to allow for water drainage.
All the power, control, and signal lines to the turntable and the 3 m and 10m antenna mast outlets are routed in shielded conduits under the plane to the control building.

3.4 Antenna Mast:

ETS model 2070-2. The antenna position and polarization are remote controlled via Fiber Optical Link using ETS/EMCO Dual Controller Type 2090. The antenna position is adjustable between 1-4 meters. Pressurized air is used to power changing the polarity of the antenna.

3.5 Turntable:

ETS model 2087 series. The position of the turntable is remote-controlled via Fiber Optic Link, using ETS/EMCO Dual Controller Type 2090. The turntable is mounted in a pit and its surface is flush with the Open Site Ground Plane. Brushes near the periphery of the turntable ensure good conductive connection to the ground plane. The Turntable maximum load is 1250 Kg.

3.6 EMI Receiver:

Type 1066.301, manufactured by Rhode & Schwarz, being in full compliance with CISPR 16 requirements.

3.7 E.U.T. Support:

Table mounted E.U.T.s are supported during testing on 80 cm high all-wooden tables (no metal nails or screws).

3.8 Test Equipment:

See details in Section 6.

4. Summary of Test Results

Test	Results
Radiated Emissions ICES-003, Issue 5; 2012, Class B	The E.U.T met the performance requirements of the specification. The margin between the emission level and the specification limit is 2.2 dB in the worst case at the frequency of 173.24 MHz, vertical polarization.

5. Equipment Under Test (E.U.T.) Description

The CelloTrack family is comprised of a small, standalone tracking device intended for mobile assets and assets having limited access to power or without a power supply at all.

The capabilities provided by the CelloTrack family can greatly reduce an enterprise's financial losses incurred as a result of the often difficult task of successfully tracking equipment such as trailers, containers and trains.

CelloTrack supports tracking, communication, GPS location-based features and maintenance capabilities similar to the compact family and supports also the following additional features:

Durability and long life, making it ideal for tracking trailers, trains, containers, high-value assets, and more.

Stand-alone tracking device. May be installed without a power supply.

An internal long-life 13.6 AHr rechargeable Li-Polymer battery providing up to three years of autonomous operation without recharging (subject to the rate of transmission).

Advanced power management algorithms preserving battery power and extending battery life period.

Highly durable IP67 weatherproof casing that houses all components – battery, GSM module and GPS module.

A 3D accelerometer that detects movement of assets and enables different transmission rates for a moving asset and a standing asset.

A programmable (ON/OFF/Test/Panic) push button, charging and communication capabilities, a tamper switch to detect tampering and two monitoring LEDs.

Almost instant assembly and removal.

Minimal maintenance.

The CelloTrack family includes the following units:

CelloTrack (regular).

CelloTrack Power.

CelloTrack Lighter.

CelloTrack IP67 6M.

CelloTrack Power 6M.

CelloTrack Lighter 6M.

CelloTrack XT.

CelloTrack XT Power.

6. List of Test Equipment

6.1 Emission Tests

The equipment indicated below by an “X” was used for testing Conducted Emission (**CE**)and Radiated Emission (**RE**)

Test equipment calibration is in accordance with ITL Q.A. Procedure PM 110 "Calibration Control Procedure", which complies with ISO 9002 and ISO/IEC Guide 17025.

Instrument	Manufacturer	Model	Serial No.	Used in Test	
				CE	RE
LISN	EMCO	3810/2BR	1297		
Transient Limiter	HP	11947A	3107A03041		
RF Amplifier	HP	8447F	3113A06386		X
EMI Receiver	Rohde & Schwarz	ESCI7	100724		
EMI Receiver	Rohde & Schwarz	1066.301	100120		X
Biconilog Antenna	EMCO	3142B	1250		X
Antenna Mast	ETS	2070-2	9608-1497		X
Turntable	ETS	2087	-		X
Mast & Table Controller	ETS/EMCO	2090	9608-1456		X

7. E.U.T. Performance Verification

7.1 Mode of Operation

The E.U.T. was fully operative and transmitted in a high rate of one transmission per 4 seconds to Pointer servers.

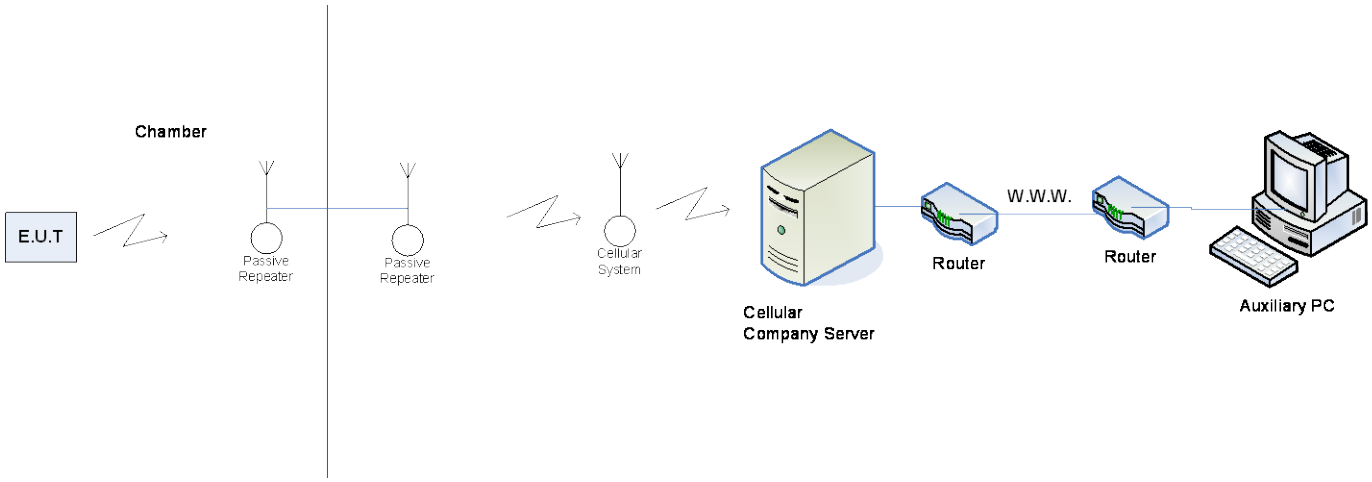


Figure 1. Test Set-up

8. Radiated Emission

8.1 Test Specification

30-1000 MHz, ICES-003, Issue 5; 2012, CLASS B

8.2 Test Procedure

The E.U.T operation mode and test set-up are as described in section 7.1.

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 effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in *Figure 3. Radiated Emission Test*.

The frequency range 30-1000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are pre-loaded into the receiver.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

Turning the E.U.T on and off.
Using a frequency span less than 10 MHz.
Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

The emissions were measured at a distance of 3 meters.

8.3 Test Results

The E.U.T met the requirements of the ICES-003, Issue 5; 2012, Class B specification.

The margin between the emission level and the specification limit is 2.2 dB in the worst case at the frequency of 173.24 MHz, vertical polarization.

The details of the highest emissions are given in *Figure 2*.

Radiated Emission

E.U.T Description	Asset Tracking Device
Type	CelloTrack3G Power P/N GT9740001-000
Serial Number:	Not designated

Specification: ICES-003, Issue 5; 2012, Class B

Antenna Polarization: Horizontal/Vertical
Antenna: 3 meters distance
Frequency range: 30 MHz to 1000 MHz
Detectors: Peak, Quasi-peak

Frequency	Peak Amp	QP Amp	Antenna Polarization:		Limit	Margin
(MHz)	dBµV/m	dBµV/m	Hor.	Ver.	dBµV/m	(dB)
698.49	40.2	37.5	X		47.5	-10.0
388.87	38.5	35.3	X		47.5	-12.2
543.25	39.5	37.6	X		47.5	-9.9
560.26	35.6	30.6	X		47.5	-16.9
749.00	39.3	33.7	x		47.5	-13.8
128.13	32.6	28.9		X	40.5	-11.6
144.30	33.5	29.7		X	40.5	-10.8
34.68	29.5	27.1		X	40.5	-13.4
173.24	42.3	38.3		x	40.5	-2.2

Figure 2. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL. Detectors: Peak, Quasi-peak

Note: 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.

9. Set Up Photographs

Figure 3. Radiated Emission Test

10. Signatures of the E.U.T's Test Engineers

Test	Test Engineer Name	Signature	Date
Radiated Emissions	D. Yadidi		30.12.12

11. APPENDIX A - CORRECTION FACTORS

11.1 Correction factors for CABLE

**from EMI receiver
to test antenna
at 3 AND 10 meter range.**

FREQUENCY	CORRECTION FACTOR	FREQUENCY	CORRECTION FACTOR
(MHz)	(dB)	(MHz)	(dB)
30	1.96	700	11.25
35	2.08	800	12.53
40	2.26	900	13.86
45	2.43	1000	14.86
50	2.59	1200	15.7
55	2.65	1400	17.05
60	2.86	1600	18.2
65	2.96	1800	19.4
70	3.04	2000	21.3
75	3.27		
80	3.41		
85	3.54		
90	3.68		
95	3.77		
100	3.93		
110	4.19		
120	4.41		
130	4.6		
140	4.83		
150	5.06		
160	5.35		
170	5.57		
180	5.7		
190	5.84		
200	6.02		
250	6.86		
300	7.59		
350	8.09		
400	8.7		
450	9.15		
500	9.53		
550	9.82		
600	10.24		
650	10.74		

NOTES:

1. The cable type is **RG-214/U**

11.2 Correction factors for Amplifier 8447F 30M-1.3G GAIN

FREQUENCY (MHz)	GAIN (dB)
20	27.16
30	27.18
50	27.15
100	27.01
200	26.48
500	27.54
1000	26.96
1100	26.69
1200	26.28
1300	25.85

11.3 Correction factors for Bilog ANTENNA

Model: 3142
Antenna serial number: 1250
3 meter range

FREQUENCY (MHz)	AFE (dB/m)	FREQUENCY (MHz)	AFE (dB/m)
30	18.4	1100	25
40	13.7	1200	24.9
50	9.9	1300	26
60	8.1	1400	26.1
70	7.4	1500	27.1
80	7.2	1600	27.2
90	7.5	1700	28.3
100	8.5	1800	28.1
120	7.8	1900	28.5
140	8.5	2000	28.9
160	10.8		
180	10.4		
200	10.5		
250	12.7		
300	14.3		
400	17		
500	18.6		
600	19.6		
700	21.1		
800	21.4		
900	23.5		
1000	24.3		

12. APPENDIX B - MEASUREMENT UNCERTAINTY

12.1 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

13. Appendix C – ICES-003 Instructions

- **Label**

Prepare Label

- Design an ICES-003 compliance label that will be affixed to all units marketed.

- ·The label must include the compliance statement below.

Example of Label:

This Class (*) digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe (*) est conforme à la norme NMB-003 du Canada.

* Insert her either “A” or “B”, whichever is applicable.

Note: The English or French wording can be used. It is the responsibility of the manufacturer or importer to determine whether the notice should appear in English, French or both languages, based upon the intended market, company marketing policies, and any other applicable provincial or federal regulations.
The label may also be combined with the label required by the FCC.

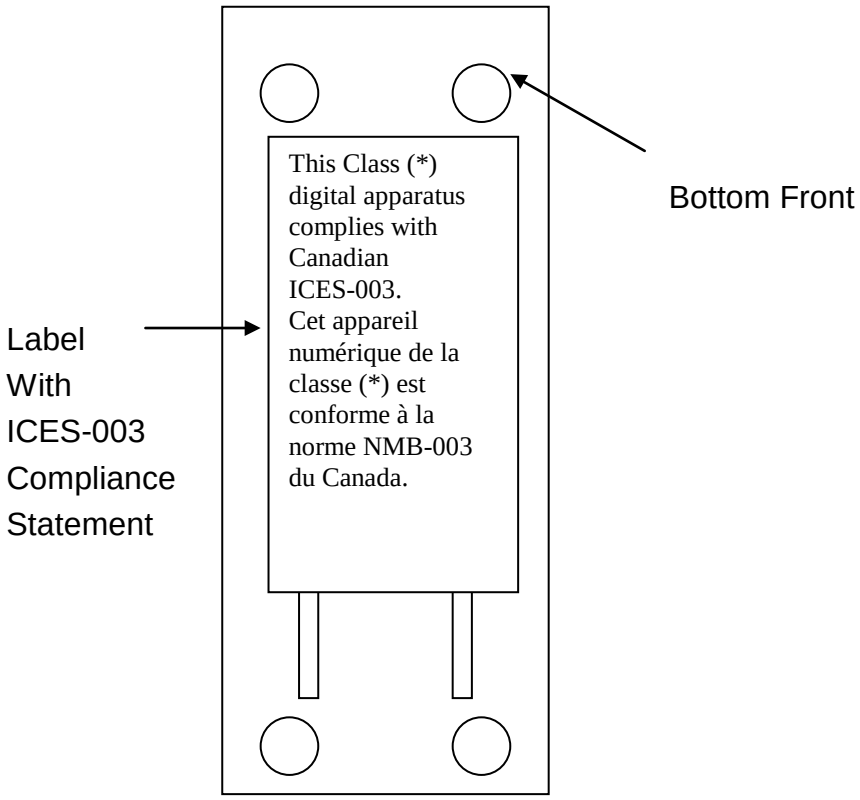
Small Products:

If the product is too small for a label containing the statement above, the information paragraph required must be placed in a prominent location in the instruction manual.

- **Label**

The compliance statement above be placed in a “conspicuous location on the device.”

Example of Product with Label:



- **ICES-003 Compliance Statement**

ICES-003 Compliance Statement in User's Manual

This Class (*) digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe (*) est conforme à la norme NMB-003 du Canada.

* Insert her either "A" or "B", whichever is applicable.

This statement needs to be placed in the user manual **only** if the product is too small for a label.

- **ICES-003 Procedural requirements**

A record of the measurements and results, showing the date that the measurements were completed (test report), shall be retained by the manufacturer or importer for a period of at least five years from the date shown in the record (date of completion of tests) and made available for examination on the request of the Minister.

A written notice indicating compliance must accompany each unit of digital apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus.

Where because of insufficient space or other constraints it is not feasible to affix a label to the apparatus, the notice may be in the form of a statement included in the user's manual.