



DATE: 25 February 2013

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

CE Radio Test Report (R&TTE Directive)

for

Pointer Telocation Ltd.

Equipment under test:

Asset Tracking Device

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*

* See customer's declaration on page 4.

Written by:

D. Shidlowsky, Documentation

Approved by:

I. Siboni, 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:	02.01.13
Start of Test:	02.01.13
End of Test:	03.01.13
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:

<i>Product Name:</i>	<i>Part Number:</i>
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 different 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 Ltd.

Itamar Gohary
Certification Manager
Pointer Telocation Ltd.

1.2 Abbreviations and Symbols

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

A/m	ampere per meter
AC	alternating current
AM	amplitude modulation
ARA	Antenna Research Associates
Aux	auxiliary
Avg	average
CDN	coupling-decoupling network
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
db μ V	decibel referred to one microvolt
db μ V/m	decibel referred to one microvolt per meter
DC	direct current
EFT/B	electrical fast transient/burst
EMC	electromagnetic compatibility
ESD	electrostatic discharge
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
per	period
QP	quasi-peak
PC	personal computer
RF	radio frequency
RE	radiated emission
sec	second
V	volt
V/m	volt per meter
VRMS	volts root mean square



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 | R&TTE Directive:
1999 | <i>DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity</i> |
| 2.2 | EN 301 511
V9.02: 2003 | <i>Global System for Mobile communications (GSM); Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC)</i> |
| 2.3 | ETSI TS 151 010-1
V7.10.0: 2008 | <i>Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1 version 7.10.0 Release 7)</i> |



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.

5. Summary of Test Results

Test	Results
<p>Spurious Emissions EN 301 511 V9.02:2003 Clause 5.2.16 TS 151 010-1 V7.10.0: 2008 Clause 12.2.1</p>	<p>The E.U.T met the performance requirements of the specification.</p> <p>The margin between the spurious emission level and the specification limit is 7.97 dB in the worst case at the frequency of 3465.70 MHz, horizontal polarization.</p>

6. 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.

7. List of Test Equipment

7.1 Emission Tests

The equipment indicated below by an "X" was used for testing Spurious Radiated Emissions, EN 301 511 V9.0.2: 2003, Clause 5.2.16.

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
Dipole Antenna Set	CDI	A100	597	X
Spectrum Analyzer	HP	8592L	3826A01204	X
Spectrum Analyzer	HP	8591E	3414U01226	X
Receiver	Rohde & Schwarz	1066.301	100120	X
Biconilog Antenna	EMCO	3142B	1250	X
Horn Antenna	ETS	3115	6142	X
Antenna Mast	ETS	2070-2	9608-1497	X
Turntable	ETS	2087	-	X
Mast & Table Controller	ETS/EMCO	2090	9608-1456	X

8. Mode of Operation

The E.U.T. was operated, transmitting to, and receiving information from the operator, through the GSM module. The operator sent and received the information via the auxiliary laptop.

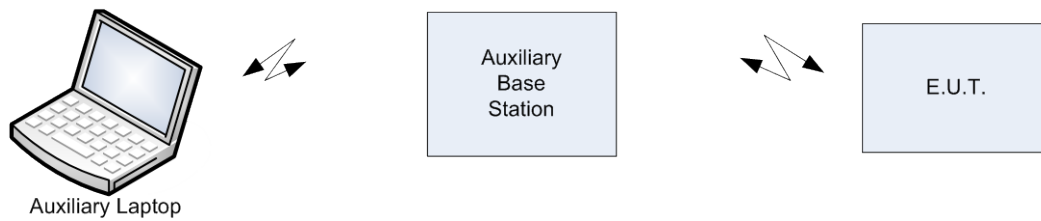


Figure 1. Test Set-up

9. Radiated Emissions

9.1 Test Specification

EN 301 511 V9.02: 2003, Clause 5.2.16

TS 151 010-1 V7.10.0: 2008, Clause 12.2.

9.2 Test Procedure

The test was performed in the frequency bands EGSM 900 and DCS 1800

The E.U.T. was operated as described in Section 7.

A preliminary measurement to identify spurious emissions except for the fundamental and harmonics was performed inside the shielded room. The E.U.T. was tested transmitting and receiving through a passive repeater in two bands EGSM900 and DCS1800. None of the spurious emissions detected were generated by the non-radio part of the unit. The E.U.T. was then transferred to the OATS.

Scanning the frequency range of 30 MHz to 4 GHz was performed. The spurious signals were recorded.

The EMI receiver was operated with 120 kHz resolution bandwidth and 300kHz video bandwidth.

The E.U.T. was replaced by the substitution antenna and a signal generator.

The signal generator was adjusted to the same level at the substitution antenna as the level measured with the E.U.T. This level was recorded.

The above tests were performed in both horizontal and vertical polarizations.

The maximum signal generator levels were recorded as the test results.

9.3 Test Results

The E.U.T met the requirements of EN 301 511 V9.02: 2003, Clause 5.2.16.

The margin between the spurious emission level and the specification limit is 7.97 dB in the worst case at the frequency of 3465.70 MHz, horizontal polarization.



Radiated Emissions

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

Specification: EN 301 511 V.9.0.1: 2003, Clause 5.216

Frequency	E	Antenna Pol.	Power Output Generator	Cable Loss	Antenna Gain	EIRP	Spec.	Margin
(MHz)	(dB μ V/m)	(H/V)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)	(dB)
3465.70	41.1	H	-56.72	10.2	9.8	-54.97	-47.0	-7.97
3465.70	41.0	V	-56.42	10.2	8.7	-55.77	-47.0	-8.77

Figure 2. Spurious Emissions Horizontal/Vertical Polarity

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.


10. Set Up Photograph



Figure 3 Spurious Emission Test



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

Test	Test Engineer Name	Signature	Date
Spurious Emission	I. Siboni		10.01.13

12. APPENDIX A - CORRECTION FACTORS

12.1 Correction factors for CABLE

from EMI receiver
to test antenna
at 3 meter range.

FRQ	S.G.	REF	A AMP		FRQ	S.G.	REF	A	
								AMP	
10K	-30	-29.8	-30.2	0.4	50M	-30	-30.5	-31.7	1.2
15K	-30	-29.5	-29.7	0.2	100M	-30	-30.5	-32.2	0.7
20K	-30	-29.7	-29.9	0.2	150M	-30	-30.4	-32.5	2.1
30K	-30	-29.6	-29.9	0.3	200M	-30	-30.5	-32.8	2.3
50K	-30	-29.7	-30.0	0.3	300M	-30	-30.4	-33.3	2.9
75K	-30	-29.7	-30.0	0.3	500M	-30	-30.5	-34.3	3.8
100K	-30	-29.8	-30.0	0.2	750M	-30	-30.7	-35.3	4.8
150K	-30	-29.8	-30.0	0.2	1G	-30	-30.9	-36.3	5.4
200K	-30	-29.9	-30.2	0.3	1.5G	-15	-15.7	-22.4	6.7
500K	-30	-29.9	-30.3	0.4	2G	-15	-15.9	-24.9	9.0
1M	-30	-30.1	-30.5	0.4	2.5G	-15	-16.3	-25.7	9.4
1.5M	-30	-30.1	-30.6	0.5	3G	-15	-16.5	-26.4	9.9
2M	-30	-30.2	-30.7	0.5	3.5G	-15	-16.7	-26.9	10.2
5M	-30	-30.3	-30.9	0.6	4G	-15	-16.3	-27.5	11.2
10M	-30	-30.2	-31.0	0.8	4.5G	-15	-16.6	-28.7	12.1
15M	-30	-30.2	-31.1	0.9	5G	-15	-16.8	-29.9	13.1
20M	-30	-30.5	-31.3	0.8	5.5G	-15	-17.6	-31.1	13.5
					6G	-15	-17.2	-31.7	14.5

NOTES:

1. The cable type is SPUMA400 RF-11N(X2) and 39m long
2. The cable is manufactured by Huber + Suhner



12.2 Correction factors for Bilog ANTENNA

Model: 3142

Antenna serial number: 1250

3 meter range

FREQUENCY	AFE	FREQUENCY	AFE
(MHz)	(dB/m)	(MHz)	(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		



12.3 Correction factors for **Horn ANTENNA**

Model: 3115
Antenna serial number: 6142
3 meter range

FREQUENCY	Antenna Factor	FREQUENCY	Antenna Factor
(MHz)	(dB/m)	(MHz)	(dB/m)
1000	23.9	10500	38.4
1500	25.4	11000	38.5
2000	27.3	11500	39.4
2500	28.5	12000	39.2
3000	30.4	12500	39.4
3500	31.6	13000	40.7
4000	33	14000	42.1
4500	32.7	15000	40.1
5000	34.1	16000	38.2
5500	34.5	17000	41.7
6000	34.9	17500	45.7
6500	35.1	18000	47.7
7000	35.9		
7500	37.5		
8000	37.6		
8500	38.3		
9000	38.5		
9500	38.1		
10000	38.6		