



DATE: 02 March 2015

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

Test Report According to ICES-003 Issue 5


(Equipment Authorization Under FCC Verification Process)
for
Pointer Telocation Ltd.

Equipment under test:

Asset Tracking Device

CelloTrack Power 3Y P/N GT976001-000
CelloTrack 3Y P/N GT9760012-000;
CelloTrack XT P/N GT9760025-000;
CelloTrack 8M P/N GT9760022-000;
CelloTrack Power XT P/N GT9760026-000;
CelloTrack Power 8M P/N GT9760021-000*

*See customer's Declaration on page 4

Tested by: 
A. Yizhak

Approved by: 
D. Shidlow

This report must not be reproduced, except in full, without the written permission of
I.T.L. (Product Testing) Ltd. This report relates only to items tested.



TABLE OF CONTENTS

1.	GENERAL INFORMATION	3
1.1	Administrative Information	3
1.2	Abbreviations and Symbols	5
1.3	List of Accreditations	6
2.	APPLICABLE DOCUMENTS	7
3.	TEST SITE DESCRIPTION	8
3.1	Location:	8
3.2	Shielded Room	8
3.3	Open Site:	8
3.4	Ground Plane:	8
3.5	Antenna Mast:	8
3.6	Turntable:	9
3.7	EMI Receiver:	9
3.8	E.U.T. Support:	9
3.9	Test Equipment:	9
4.	SYSTEM TEST CONFIGURATION	10
4.1	Mode of Operation	10
4.2	Equipment Modifications	10
5.	SUMMARY OF TEST RESULTS	11
6.	EQUIPMENT UNDER TEST (E.U.T.) DESCRIPTION	12
7.	LIST OF TEST EQUIPMENT	13
7.1	Emission Tests	13
8.	RADIATED EMISSION	14
8.1	Test Specification	14
8.2	Test Procedure	14
8.3	Test Results	15
9.	SET UP PHOTOGRAPHS	17
10.	SIGNATURES OF THE E.U.T'S TEST ENGINEERS	18
11.	APPENDIX A - CORRECTION FACTORS	19
11.1	Correction factors for CABLE	19
11.2	Correction factors for Bilog ANTENNA	20
12.	APPENDIX B - MEASUREMENT UNCERTAINTY	21
12.1	Radiated Emission	21
13.	APPENDIX C – ICES-003 INSTRUCTIONS	22

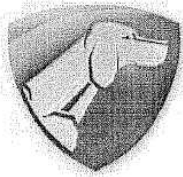


1. General Information

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.:	CelloTrack Power 3Y P/N GT976001-000*
Equipment Serial No.:	Not designated
Date of Receipt of E.U.T:	02.07.14
Start of Test:	02.07.14
End of Test:	03.07.14
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 7120101
Test Specifications:	See Section 2

* See customer's Declaration on following page.



POINTER



CelloTrack Division
Pointer Telocation Ltd.

Date: 24 July 2014

Declaration

I hereby declare that the **CelloTrack Power 3Y GT9760001-000** is a full configuration model. The below model's:

<i>Product Name:</i>	<i>Part Number:</i>
GT9760012-000	CelloTrack 3Y
GT9760025-000	CelloTrack XT
GT9760022-000	CelloTrack 8M
GT9760026-000	CelloTrack Power XT
GT9760021-000	CelloTrack Power 8M

differs from the **CelloTrack Power 3Y GT9760001-000** 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: *[Handwritten 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:

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
db μ V	decibel referred to one microvolt
db μ V/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. FCC Designation Number: US1004
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.

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 | <i>Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus</i> |
| 2.2 | CAN/CSA-CEI/IEC CISPR 22: 10 | <i>Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement</i> |
| 2.3 | ANSI C63.4-2003 | <i>American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.</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, 7120101 Israel.

Telephone: +972-8-9153100

Fax: +972-8-9153101

3.2 Shielded Room

A Modular Shielded Room, Type 20 SpaceSaver, manufactured by ETS, consisting of a Main Room and a Control Room.

The dimensions of the Main Room are: length: 7.0 m, width: 3.0 m, height: 3.0 m.

The shielding performance is:

magnetic field: 60 dB at 10 kHz rising linearly to 100 dB at 100 kHz,

electric field: better than 110 dB between 50 MHz and 1 GHz,

plane wave: 110 dB between 50 MHz and 1 GHz.

All the power lines entering the shielded room are filtered.

3.3 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.

3.4 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.

3.5 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.



3.6 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.

3.7 EMI Receiver:

Type ESIB7, manufactured by Rohde & Schwarz, being in full compliance with CISPR 16 requirements.

3.8 E.U.T. Support:

Table mounted E.U.T.s are supported during testing on 80 cm high all plastic table.

3.9 Test Equipment:

See details in Section 6.

4. System Test Configuration

4.1 Mode of Operation

The E.U.T. was operated in regular operation mode. Power supply was supplied 12 VDC.

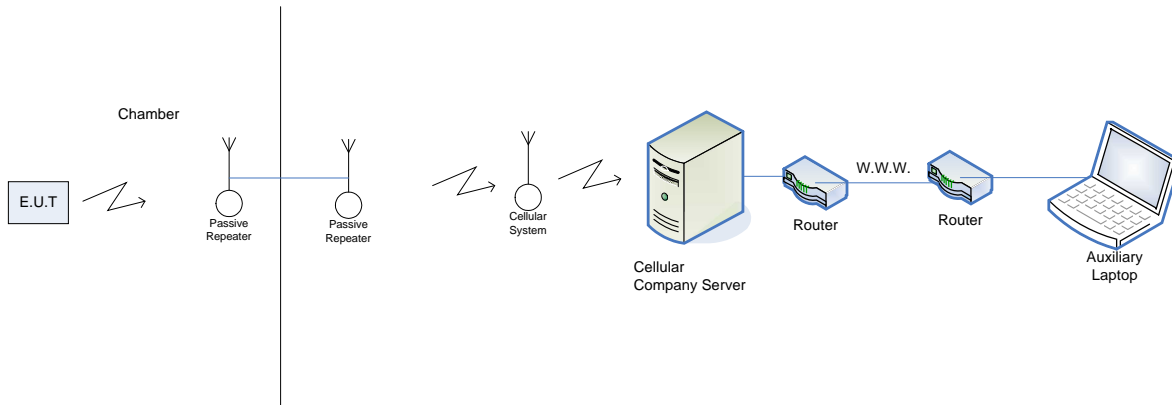


Figure 1. Configuration of Tested System

4.2 Equipment Modifications

No modifications were required in order to achieve compliance.



5. 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 was 13.0 dB in the worst case at the frequency of 310.9 MHz, horizontal polarization.



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 3Y;

CelloTrack XT;

CelloTrack 8M;

CelloTrack Power 3Y;

CelloTrack Power XT;

CelloTrack Power 8M.



7. List of Test Equipment

7.1 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	Fischer	FCC-LISN-2A	127		
Transient Limiter	HP	11947A	3107A03041		
EMI Receiver	Rohde & Schwarz	ESCI7	100724		
EMI Receiver	Rohde & Schwarz	ESIB7	100120		X
EMC Analyzer	HP	HP8593	3536A00120		X
Biconilog Antenna	EMCO	3142B	1250		X
Horn Antenna	ETS	3115	6142		
Antenna Mast	ETS	2070-2	9608-1497		X
Turntable	ETS	2087	-		X
Mast & Table Controller	ETS/EMCO	2090	9608-1456		X

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 4.1.

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 E.U.T. highest frequency source or used frequency is 8 MHz.

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 with CISPR 16 requirements. The specification limits and applicable correction factors are pre-loaded to 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.

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

$$FS = RA + AF + CF$$

Where:

FS: Field strength [dBμV/m]

RA: Receiver Amplitude [dBμV]

AF: Receiving Antenna Correction Factor [dB/m]

CF: Cable attenuation Factor [dB]

Example: $FS = 30.7 \text{ dB}\mu\text{V (RA)} + 14.0 \text{ dB (AF)} + 0.9 \text{ dB (CF)} = 45.6 \text{ dB}\mu\text{V}$



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 13.0 dB in the worst case at the frequency of 310.9 MHz, horizontal polarization.

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



Radiated Emission

E.U.T Description Asset Tracking Device
Type CelloTrack Power 3Y P/N
 GT976001-000
Serial Number: Not designated

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

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

Frequency (MHz)	Peak Amp dB μ V/m	QP Amp dB μ V/m	Avg Amp dB μ V/m	Antenna Polarization:		Limit dB μ V/m	Margin (dB)
				Hor.	Ver.		
117.26	35.3	26.7		X		43.5	-16.8
231.50	36.9	31.5		X		46.0	-14.5
310.90	38.5	33.0		X		46.0	-13.0
496.25	40.1	32.0		X		46.0	-14.0
647.40	38.0	32.2		X		46.0	-13.8
224.00	35.36	30.8			X	43.0	-12.2
450.00	37.8	31.0			X	46.0	-15.0

**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	A. Yizhak		17.08.14

11. APPENDIX A - CORRECTION FACTORS

11.1 Correction factors for CABLE

from EMI receiver
to test antenna
at 3 meter range.

Frequency (MHz)	Cable Loss (dB)
0.010	0.4
0.015	0.2
0.020	0.2
0.030	0.3
0.050	0.3
0.075	0.3
0.100	0.2
0.150	0.2
0.200	0.3
0.500	0.4
1.00	0.4
1.50	0.5
2.00	0.5
5.00	0.6
10.00	0.8
15.00	0.9
20.00	0.8

Frequency (MHz)	Cable Loss (dB)
50.00	1.2
100.00	0.7
150.00	20.1
200.00	2.3
300.00	2.9
500.00	3.8
750.00	4.8
1000.00	5.4
1500.00	6.7
2000.00	9.0
2500.00	9.4
3000.00	9.9
3500.00	10.2
4000.00	11.2
4500.00	12.1
5000.00	13.1
5500.00	13.5
6000.00	14.5

NOTES:

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



11.2 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. 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

Ñ 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.

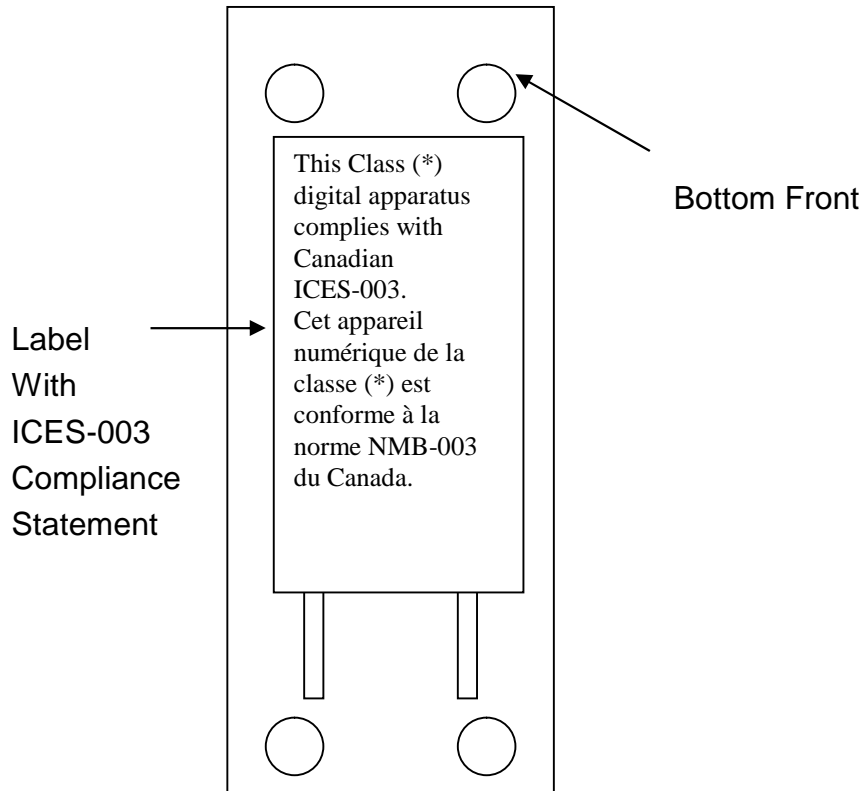
The label may also be combined with the label required by the FCC.

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.

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

Example of Product with Label:





Ñ 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.

Ñ 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.