



DATE: 17 March 2016


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

**Test Report According to
EN 62311: 2008**

**for
Pointer Telocation**

**Equipment under test:
Self-Powered Smart Hub**

**CelloTrack Nano 20, P/N: GC9770001-000;
CelloTrack Nano 20 3G, P/N GC9771004-000;
CelloTrack Nano 10, P/N GC9770002-000*
CelloTrack Nano 10 3G, P/N GC9771003-000***

Tested by: 
M. Zohar

Approved by: 
D. Shidlow

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1. General Information

Administrative Information

Manufacturer: Pointer Telocation

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): Self-Powered Smart Hub

Equipment Model No.: CelloTrack Nano 20, P/N: GC9770001-000;
CelloTrack Nano 20 3G, P/N GC9771004-000
CelloTrack Nano 10, P/N GC9770002-000*
CelloTrack Nano 10 3G, P/N GC9771003-000*

Equipment Serial No.: 982966; 982968

Date of Receipt of E.U.T: 21 December 2015

Start of Test: 21 December 2015

End of Test: 21 December 2015

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

Test Specifications: EN 62311: 2008

See customer's Declaration on following page.



DECLARATION

Date: 14/2/2016

I HEREBY DECLARE THE FOLLOWING REGARDING THE BELOW MODELS:

#	Product name	P/N
1	CelloTrack Nano 20	GC9770001-000
2	CelloTrack Nano 20 3G	GC9771004-000
3	CelloTrack Nano 10	GC9770002-000
4	CelloTrack Nano 10 3G	GC9771003-000

All of the above models use the same PCB.

These models are all identical except:

1. That P/N GC9770001-000 has the Cinterion BGS2-W 2G GSM cellular modem while P/N GC9771004-000 has the Cinterion EHS6A 3G cellular modem.
2. That in P/N GC9770002-000 and P/N GC9771003-000 the 2.4GHz transmitter is deactivated by firmware.
3. That in both P/N GC9770001-000 and P/N GC9770002-000 have the Cinterion BGS2-W 2G GSM cellular modem while P/N GC9771003-000 and P/N GC9771004-000 both have the Cinterion EHS6A 3G cellular modem.

Please relate to them (from an EMC/RADIO point of view) as the same product.

~~Signature~~ **IGOR ROGOV**
~~Igor Rogov~~ 16-02-2016
~~VP R&D~~ **VP R&D**
 Pointer Telocation Inc.



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



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 Number 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; Site Nos. IC 4025A-1, IC 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.



2. Applicable Documents

- | | | |
|-----|---|---|
| 2.1 | Council Recommendation 1999/519/EC | <i>Limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz), Official Journal L 199 of 30 July 1999</i> |
| 2.2 | EN 62311: 2008 | <i>Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 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 ESCI7, 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. Summary of Test Results

Test	Results
Electric Field Strength EN 62311: 2008, Clause 4	The E.U.T. met the specification requirements.



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

CelloTrack Nano 20, P/N: GC9770001-000:

Self-powered Smart hub for Asset & Cargo Management IoT applications supporting 2G cellular communication, GNSS, short range RF and wide sensing capabilities. The E.U.T. contains a Cinterion BGS2 Wireless 2G module

CelloTrack Nano 20 3G, P/N: GC9771004-000:

Self-powered Smart hub for Asset & Cargo Management IoT applications with universal 3G cellular communication, GNSS, short range RF and wide sensing capabilities. The E.U.T. contains a Cinterion EHS6 Wireless 3G module.



6. List of Test Equipment

6.1 Emission Tests

The below equipment was used for testing Electric Field Strength per EN 62311: 2008, Clause 4

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

Instrument	Manufacturer	Model	Serial No.
Istotropic Field Probe	AR	FP2080	23190
Istotropic Field Monitor	AR	FM2000	23294

7. Mode of Operation

The evaluation was performed in 2 operational modes: 2G (GSM) for the CelloTrack Nano 20, P/N: GC977001-00, and 3G (UMTS) for CelloTrack Nano 20 3G, P/N: GC9771004-00.

The probe was placed as close as possible to the E.U.T. in order to detect maximum emissions.

The testing was performed only for the 2G and 3G technologies. The Wi-Fi was off during testing.

Each E.U.T. was tested separately.

The Wi-Fi transmitter in each E.U.T. was not operated during these tests.

The E.U.T. was powered via an AC/DC adapter charging the internal 3.7VDC rechargeable battery.

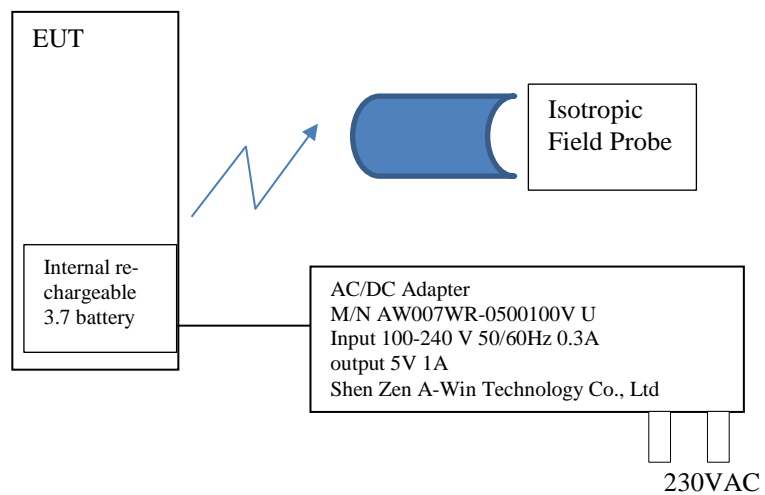


Figure 1. Test Set-Up

8. Electric Field Strength

8.1 Test Specification

EN 62311: 2008; Clause 4; Annex III of Council Recommendation 1999/519/EC

8.2 Test Procedure

Testing was performed according to Annex F of EN 62311: 2008.

An isotropic field probe with the range switch set on the most sensitive scale was used.

The probe was moved progressively closer to the regions of higher field strength. The field measurements were performed at the normal user position. The electric component of the electromagnetic field was measured.

Calculate limit:

For 400M-2000MHz frequencies: E-field strength (V/m)= $1.375 * f^{1/2}$

(f as indicated in the frequency range)

For worst case (f=900MHz GSM band): E-field strength (V/m)= $1.375 * 900^{1/2} = 41.2$ V/m

8.3 Test Results

The E.U.T. met the requirements of EN 62311: 2008.

Measured E field (V/m)	Limit (V/m)	Margin (V/m)
12.1	41.2	-29.1

Figure 2. Results for 2G

Measured E field (V/m)	Limit (V/m)	Margin (V/m)
6.5	41.2	-34.7

Figure 3. Results for 3G

9. Set Up Photographs



Figure 4. E-Field Strength Test



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

Test	Test Engineer Name	Signature
E-Field Strength	M. Zohar	