



DATE: 1 April 2014

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


Test Report According to FCC Part 15, Subpart B


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

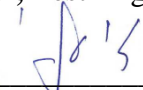
Equipment under test:

Cellocator Cello

Cello-CANiQ (3G) P/N CT78000140-000

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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):	Cellocator Cello
Equipment Model No.:	Cello-CANiQ (3G) P/N CT78000140-000,
Equipment Serial No.:	Not designated
Date of Receipt of E.U.T:	30.03.2014
Start of Test:	31.03.2014
End of Test:	31.03.2014
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 9978000
Test Specifications:	See Section 2



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. The Federal Communications Commission (FCC) (U.S.A.),
Registration No. 90715.
3. The Israel Ministry of the Environment (Israel),
Registration No. 1104/01.
4. Industry Canada (Canada), IC File No.: 46405-4025;
Site No. IC 4025B-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 **Code of Federal Regulations Title 47,
Federal Communications Commission
Part 15, Subpart B.
Rev. July 09, 2013
GPO Access Web Site** *Unintentional Radiators.*
- 2.2 **ANSI C63.4-2003** *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.*



3. Test Site Description

3.1 Location

The Electromagnetic Compatibility Test Facility of I.T.L. (PRODUCT TESTING) LTD. is located at Kfar Bin Nun, Israel 9978000 (FCC Registration No. 90715)
Telephone: + 972-8-9797799, Fax: + 972-8-9797702

3.2 Shielded Room

A Modular Shielded Room, Type S81, manufactured by Rayproof, consisting of a Main Room and a Control Room.

The dimensions of the Main Room are: length: 7.4 m, width: 4.35 m, height: 3.75 m.

The dimensions of the Control Room are: length: 3.12 m, width: 2.5 m, height: 2.5 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 both shielded rooms are filtered.

3.3 Open Test Site

Consists of 3 meter and 10 meter ranges, using a 7x14 meter solid metal ground plane, a remote controlled turntable and an antenna mast. The turntable and the tested equipment that is placed on it are environment protected. All the power, control and signal lines are routed under the ground plane.

3.4 Antenna Mast

Type AAM-4/A, manufactured by Antenna Research Associates (ARA). The antenna position and polarization are remotely controlled via Fiber Optical Link using ARA Dual Controller Type ACU-2/5, and pressurized air.

The antenna position is adjustable between 1-4 meters.

3.5 Turntable

Type ART-1001/4, manufactured by ARA. The position of the turntable is remotely controlled via a Fibre Optic Link, using ARA Dual Controller Type ACU-2/5. The turntable is mounted in a pit and its surface is flush with the Open Site Ground Plane.

3.6 EMI Receiver

Type HP8542E, including HP85420E R.F. filter manufactured by Hewlett-Packard, being in full compliance with CISPR 16 requirements.

3.7 Test Equipment

See details in Section 6.

5. System Test Configuration

5.1 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

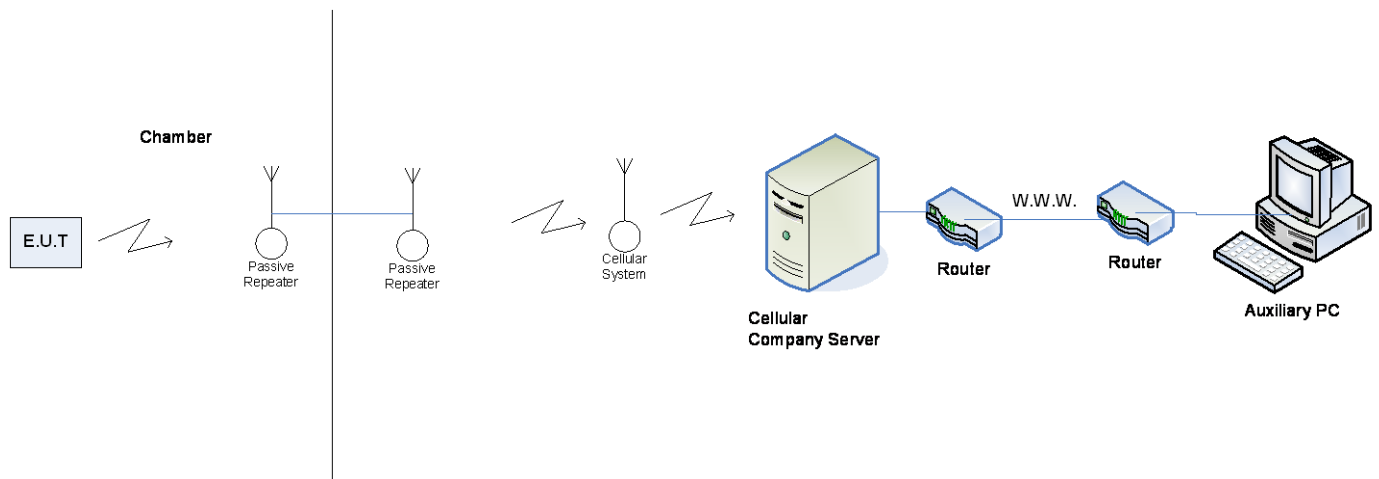


Figure 1. Configuration of Tested System

5.2 Equipment Modifications

No modifications were required in order to achieve compliance.



6. Summary of Test Results

Test	Results
Radiated Emissions FCC Part 15, Subpart B Class B	<p>The E.U.T met the performance requirements of the specification.</p> <p>The margin between the emission level and the specification limit is 13.7 dB in the worst case at the frequency of 37.4 MHz, horizontal polarization.</p>



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

The Cello-CANiQ addresses the mid and high-end segments of fleet management products for various advanced applications concerned with vehicle, driver and logistics management.

The Cello-CANiQ allows connectivity with various vehicle environment interfaces, including standard CANBUS and OBD interfaces, driver Identification, serial communication interfaces with 3rd party devices, discrete, analog and frequency measurement ports, voice channel, DTCO and others. All these interfaces are developed and configured for maximum flexibility in data aggregation, filtering, processing and reporting in a way which enables development of future applicative add-ons.

The Cello-CANiQ provides modular and scalable HW options (“peripherals ready” such as SD card, DTCO D8 connectivity and multiple communication technology support) as well as a highly flexible and configurable infrastructure for easy programming of the requested triggering, reaction and messaging scheme as a function of complex array of inputs received from the vehicle bus.

The Cello-CANiQ lays the infrastructure for the provisioning of field engineering services and professional services aimed at solving customer needs or market problems in short time and minimum resources.

The Cello-CANiQ supports DIRECT connectivity to vehicle data buses supporting J1939 or ISO-15765 via OBDII connector. HW form and fit are not changed and the enclosure and connectors look similar to other Cello family devices. Nevertheless, this product features a few important enhancements and improvements, such as HW compatibility with 3G modems, GPS & Glonass Hybrid positioning engine and other infrastructure changes and enablers, as described in the following sections.

The E.U.T. includes a GSM modem with FCC and IC modular approval.



8. List of Test Equipment

8.1 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
Dipole Antenna Set	CDI	A100	597		
LISN	Fischer	FCC-LISN-2A	127		
LISN	Fischer	FCC-LISN-2A	128		
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013		
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232		
Low Noise Amplifier	MK Milliwave	MKT6-3000 4000-30-13P	399		
Spectrum Analyzer	HP	8592L	3926A01204		
Spectrum Analyzer	HP	8546E	3442A00275		
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845		
Horn Antenna	ARA	SWH-28	1007		
Horn Antenna	Narda	V637	0410		
EMI Receiver	HP	85422E	3906A00276		X
Receiver RF Filter Section	HP	85420E	3705A00248		X
Antenna - Biconical	ETS	3109	002-3244		X
Antenna - Log Periodic	ARA	LPD-2010/A	1038		X
Antenna Mast	ARA	AAM-4A			X
Turntable	ARA	ART-1001/4			X
Mast & Table Controller	ARA	ACU-2/5	1001		X



9. Radiated Emission

9.1 Test Specification

30-1000 MHz, FCC Part 15, Subpart B, CLASS B

9.2 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 16 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 to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

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 [dB μ V/m]

RA: Receiver Amplitude [dB μ V]

AF: Receiving Antenna Correction Factor [dB/m]

CF: Cable attenuation Factor [dB]

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



9.3 Test Results

The E.U.T met the requirements of the FCC Part 15, Subpart B, Class B specification.

The margin between the emission level and the specification limit is 13.7 dB in the worst case at the frequency of 37.4 MHz, horizontal polarization.

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



Radiated Emission

E.U.T Description Cellocator Cello
Type Cello-CANiQ (3G) P/N CT78000140-000
Serial Number: Not designated

Specification: FCC Part 15, Subpart B, 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 dBµV/m	QP Amp dBµV/m	Antenna Polarization:		Limit dBµV/m	Margin (dB)
			Hor.	Ver.		
37.4	26.5	21.9		X	40.0	-18.1
39.7	28.2	25.9		X	40.0	-14.1
42.9	31.6	23.8		X	40.0	-16.2
37.4	29.8	26.3	X		40.0	-13.7
39.7	26.2	21.5	X		40.0	-18.5
42.9	30.0	24.5	X		40.0	-15.5

**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.


10. Set Up Photographs



Figure 3. Radiated Emission Test



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

Test	Test Engineer Name	Signature	Date
Radiated Emissions	A. Sharabi		04.05.14



12. APPENDIX A - CORRECTION FACTORS

12.1 Correction factors for CABLE from EMI receiver to test antenna at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3	1200.0	7.3
20.0	0.6	1400.0	7.8
30.0	0.8	1600.0	8.4
40.0	0.9	1800.0	9.1
50.0	1.1	2000.0	9.9
60.0	1.2	2300.0	11.2
70.0	1.3	2600.0	12.2
80.0	1.4	2900.0	13.0
90.0	1.6		
100.0	1.7		
150.0	2.0		
200.0	2.3		
250.0	2.7		
300.0	3.1		
350.0	3.4		
400.0	3.7		
450.0	4.0		
500.0	4.3		
600.0	4.7		
700.0	5.3		
800.0	5.9		
900.0	6.3		
1000.0	6.7		

NOTES:

- 1. The cable type is RG-214.*
- 2. The overall length of the cable is 27 meters.*
- 3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".*



12.2 Correction factors for Log Periodic Antenna Type LPD 2010/A at 3 and 10 meter ranges.

Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	12.5
400.0	15.4
500.0	16.1
600.0	19.2
700.0	19.4
800.0	19.9
900.0	21.2
1000.0	23.5

Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.8
400.0	15.3
500.0	15.6
600.0	18.7
700.0	19.1
800.0	20.2
900.0	21.1
1000.0	23.2

NOTES:

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M30.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".



12.3 Correction factors for BICONICAL ANTENNA

**Type 3109,
at 3 meter range**

FREQUENCY (MHz)	AFE (dB/m)
30.0	13.3
40.0	12.7
50.0	11.0
60.0	9.2
70.0	10.0
80.0	7.2
90.0	7.9
100.0	9.4
120.0	11.9
140.0	13.1
160.0	12.3
180.0	12.4
200.0	14.8
250.0	15.3
300.0	17.9

NOTE:

1. Antenna serial number is 002-3244.



13. APPENDIX B - MEASUREMENT UNCERTAINTY

13.1 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



14. Appendix C - FCC Verification Process Instructions

•Label

Prepare Label

- Design a FCC compliance label that will be affixed to all units marketed.
- The label must include the compliance statement below.

Example of Label:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Note - The label may also contain other information, such as the model number, the country of origin, etc. (The country of origin information is required by Customs and the Federal Trade Commission for imports to the U.S.)

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 or, alternatively, the information can be placed on the container in which the product is marketed.

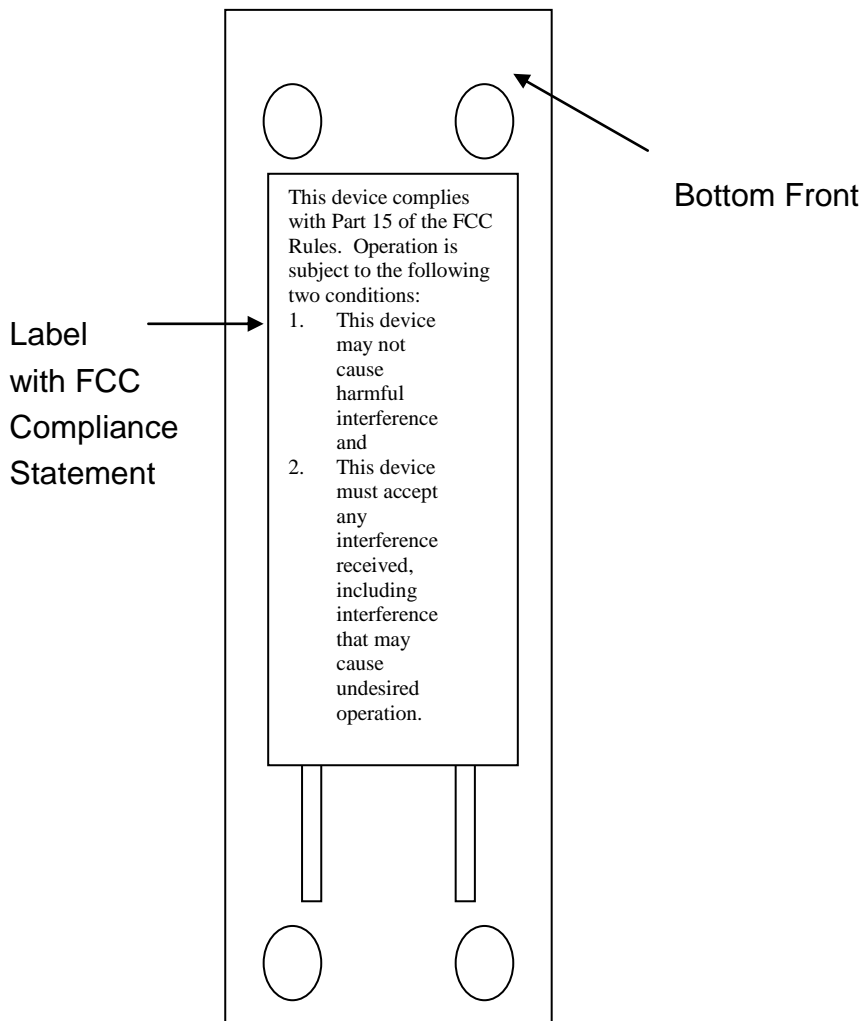
•Label

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

The following are the FCC Rules about how the label will be permanently attached.:

The label is expected to last the life of the product. It must be permanently marked (etched, engraved, indelibly printed, etc.) either directly on the device, or on a tag that is permanently affixed (riveted, welded, etc.) to the device.

Example of Product with Label:





●FCC Compliance Statement

FCC Compliance Statement in User's Manual

For a Class A or Class B digital device or peripheral, the instructions given to the user shall include the following, or a similar, statement that should be placed in a prominent location in the text of the manual. (from FCC Rules 15.105)

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. (from FCC Rules 15.21)

Information about any special accessories needed to ensure FCC compliance must also be included.

Sample User Information for a Class A digital device:

The FCC Wants You to Know

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

FCC Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.



Sample User Information for a Class B digital device:

The FCC Wants You to Know

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- a) Reorient or relocate the receiving antenna.
- b) Increase the separation between the equipment and receiver.
- c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician.

FCC Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.