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TESTING Cert No.1152.01

DATE: 4 August 2021

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

Test Report According to
EN 301 908-1 V13.1.1 (2019)
EN 301 908-2 V13.1.1 (2020)
EN 301 908-13 V13.1.1 (2019)

for

Pointer Telocation Ltd.

Equipment under test:

Fleet Management Device

CR-400

Tested by: _____
M. Zohar

Approved by: _____
D. Shidlowsky

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1. General Information

1.1 Administrative Information

Manufacturer:	Pointer Telocation Ltd.
Manufacturer's Address:	14 Hamelacha Street, Rosh Ha'ayin 48091, Israel Tel: +972-3-5723111 Fax: +972-3-5723100
Manufacturer's Representative:	Itamar Gohary
Equipment Under Test (E.U.T):	Fleet Management Device
Equipment Model No.:	CR-400
Equipment Serial No.:	Not designated
Date of Receipt of E.U.T:	April 22, 2021
Start of Test:	April 22, 2021
End of Test:	April 22, 2021
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Bat Sheva St., Lod, 7120101, Israel
Test Specifications:	EN 301 908-1 V13.1.1 (2019) EN 301 908-2 V13.1.1 (2020) EN 301 908-13 V13.1.1 (2019) (*See Note below)

*Note: the E.U.T. contains a CE approved 3G/4G cellular module, manufactured by Telit, model no. ME910G1-WW (see compliance statement on following page).

Accordingly, as agreed upon with the customer, only spurious emissions testing was performed.

GSM Association
2nd Floor, The Walbrook Building, 25 Walbrook, London EC4N 8AF. Tel: + 44 207 356 0600, Fax: + 44 207 356 0601
http://www.gsma.com

Date:01/07/2019
S/N : 84TTFXVC6Q

To Whom It May Concern

Dear Sir/Madam,

This is to confirm that the following TAC has been officially issued by a GSMA appointed Reporting Body from the GSMA IMEI database.
TAC : 35920610
TAC Holder : Telit Communications SpA
Brand Name : Telit
Model Name : ME910G1-WW
Marketing Name : ME910G1-WW
Quantity of SIM Slots on the device : 1
Note:This may be zero if non-removable UICC/eUICC have been selected on the TAC form
Quantity of IMEI : 1

IMEI ranges are allocated on request; evidence of regulatory compliance is not required for an IMEI allocation.

The first 2 digits of the TAC identify the Reporting Body that allocated the TAC
01 – CTIA, 35 & 98 – BABT, 86 – TAF
For more details please consult TS.06 IMEI Allocation and Approval Process document which may be downloaded via this link
https://www.gsma.com/newsroom/terminal-steering-group/ts-06-imei-allocation-and-approval-process/

For other questions, please do not hesitate to contact us.

Best Regards

Paul Gosden
Global Decimal Administration | GSMA

GSMA Ltd | terminals@gsma.com

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
CBW	channel bandwidth
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
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.), FCC Designation Number IL1005.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. Department of Innovation, Science and Economic Development (ISED) Canada, CAB identifier: IL1002

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	**EN 301 908-1 V13.1.1 (2019)**	*IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 1: Introduction and common requirements*
2.2	**EN 301 908-2 V13.1.1 (2020)**	*IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)*
2.3	**EN 301 908-13 V13.1.1 (2019)**	*IMT cellular networks; Harmonised Standard for access to radio spectrum; Part 13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE)*

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 150 cm high all plastic table.

3.9 Test Equipment

See details in Section 6.

4. Summary of Test Results

Test	Results
Radiated Emissions (UE) EN 301 908-1 V13.1.1 (2019) Sections 4.2.2, 5.3.1	The E.U.T met the performance requirements of the specification.

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

Model: CR-400

The product is a Fleet Management Device that contains a CE-approved and FCC-certified 4G cellular module (Telit model ME910G1-WW), a CE-approved GNSS receiver module, and a BLE transceiver. It is installed in a vehicle and is DC-powered from the vehicle battery. The unit is currently in the process of approval per EU requirements. The unit has not been certified for FCC.

The Telit 4G cellular module model ME910C1 was replaced by a Telit 4G cellular module model ME910G1 (same vendor), with the same specifications and same footprint (pin-to-pin compatible).

The CR-400 model name with the new ME910G1 model remains unchanged and is the same as for the CR-400 with existing ME910C1 model.

Figure 1 The E.U.T.

6. List of Test Equipment

Instrument	Manufacturer	Model	Serial No.
EMI Receiver	R&S	ESCI7	100724
Spectrum Analyzer	HP	8564E	3442A00275
EMI Receiver	HP	8542E	3906A00276
RF Filter Section	HP	85420E	3705A00248
EMI Test Receiver	R&S	ESN	835420/008
Spectrum Analyzer	HP	8593EM	3536A00120ADI
Biconical Antenna	EMCO	3110B	9912-3337
Log Periodic Antenna	EMCO	3146	9505-4081
1G-18GHz Horn Antenna	ETS	3115	29845
Low Noise Amplifier	Narda	DBS-0411N313	13
Low Noise Amplifier	Sophia Wireless	LNA28-B	232
Semi Anechoic Civil Chamber	ETS	S81	SL 11643
Signal Generator	Wiltron	6747B	278007

7. Mode of Operation

1. The E.U.T contains a CE approved cellular module using 4G technology.
2. The evaluation was performed with the E.U.T. in typical operation orientation.
3. The E.U.T. was tested while transmitting continuously, using auxiliary equipment.
4. The evaluation was performed in two modes (traffic and idle) and at a representative frequency of 778.0MHz

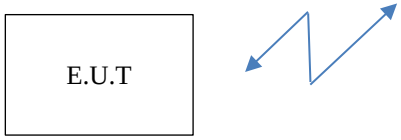

Figure 2. Test Setup

8. Radiated Emissions (UE)

8.1 Test Specification

EN 301 908-1 V13.1.1: 2019, sections 4.2.2, 5.3.1

8.2 Test Procedure

(Temperature (22°C)/ Humidity (50%RH))

The test was performed in the cellular frequency bands.

The test was performed in the frequency band 30.0MHz –12.75GHz.

For 30.0-1000.0 MHz range:

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, 1.5 meters above the ground at a distance of 3 meters from test antenna.

RBW was set to 100 kHz.

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

The frequency range 30.0-1000.0 MHz was scanned.

For 1000.0-12,750.0 MHz range:

The E.U.T was placed in the chamber and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 1.5 meters above the ground at a distance of 3 meters from test antenna.

RBW was set to 1000 kHz.

The readings were maximized by adjusting the turntable azimuth between 0-360° and the antenna polarization.

The frequency range 1000.0-12,750.0 MHz was scanned.

RMS detector was used for all the tests.

The E.U.T. was replaced by a substitution antenna. The substitution antenna was driven by a signal generator operating in C.W. Mode. The height of the test antenna was adjusted for maximum level.

The input signal of the substitution antenna was adjusted to the level that produced a receiver reading equal to the level noted while the spurious emissions of the E.U.T. were measured.

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

The transmitter was set to the lowest operating frequency and to the highest operating frequency.

The spurious emission was calculated as follows:

ERP = Signal Generator Level (dBm) – Cable Loss (dB) + Substitution Antenna Gain (dBd).

8.3 Test Limit

Frequency	Minimum requirement (ERP)/ reference bandwidth idle mode	Minimum requirement (ERP)/ reference bandwidth traffic mode
30 MHz ≤ f < 1 000 MHz	-57 dBm/100 kHz	-36 dBm/100 kHz
1 GHz ≤ f < 12,75 GHz	-47 dBm/1 MHz	-30 dBm/1 MHz

8.4 Test Results

The E.U.T met the requirements of EN 301 908-1 V13.1.1: 2019, Sections 4.2.2, 5.3.1. Additional details are given in Figure 3 to Figure 4.

Radiated Emissions (UE)

Specification: EN 301 908-1 V13.1.1: 2019, sections 4.2.2, 5.3.1

Operating Frequency	Frequency	Field strength	Pol.	Generator Output Power	Cable Loss	Antenna Gain	ERP	Limit	Margin
(MHz)	(MHz)	(dBµV/m)	(H/V)	(dBm)	(dB)	(dBd)	(dBm)	(dBm)	(dB)
778.0	No emissions detected above the spectrum analyzer noise level which have at least 10dB margin below the limit								

Figure 3. 4G mode Spurious Emissions Traffic Mode

Operating Frequency	Frequency	Field strength	Pol.	Generator Output Power	Cable Loss	Antenna Gain	ERP	Limit	Margin
(MHz)	(MHz)	(dBµV/m)	(H/V)	(dBm)	(dB)	(dBd)	(dBm)	(dBm)	(dB)
N/A	No emissions detected above the spectrum analyzer noise level which have at least 10dB margin below the limit								

Figure 4. 4G mode Spurious Emissions Idle Mode

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. Setup Photographs

Figure 5 Spurious Emission Test

10. APPENDIX A - CORRECTION FACTORS

10.1 For ITL #1911 OATS RF Cable

Frequency (MHz)	Cable Loss (dB)		Frequency (MHz)	Cable Loss (dB)
1.0	0.5		450.00	5.83
10.00	1.0		500.00	6.33
20.00	1.34		550.00	6.67
30.00	1.5		600.00	6.83
50.00	1.83		650.00	7.17
100.00	2.67		700.00	7.66
150.00	3.17		750.00	7.83
200.00	3.83		800.00	8.16
250.00	4.17		850.00	8.5
300.00	4.5		900.00	8.83
350.00	5.17		950.00	8.84
400.00	5.5		1000.00	9.0

10.2 For ITL #1840 Anechoic Chamber RF Cable

Frequency (MHz)	Cable Loss (dB)		Frequency (MHz)	Cable Loss (dB)
1000.0	-1.4		10000.0	-6.0
1500.0	-1.7		10500.0	-6.2
2000.0	-2.0		11000.0	-6.2
2500.0	-2.3		11500.0	-6.0
3000.0	-2.6		12000.0	-6.0
3500.0	-2.8		12500.0	-6.1
4000.0	-3.1		13000.0	-6.3
4500.0	-3.3		13500.0	-6.5
5000.0	-3.6		14000.0	-6.7
5500.0	-3.7		14500.0	-7.0
6000.0	-4.0		15000.0	-7.3
6500.0	-4.4		15500.0	-7.5
7000.0	-4.7		16000.0	-7.6
7500.0	-4.8		16500.0	-8.0
8000.0	-5.0		17000.0	-8.0
8500.0	-5.1		17500.0	-8.1
9000.0	-5.6		18000.0	-8.2
9500.0	-5.8			

10.3 For ITL # 1075 Active Loop Antenna

Frequency (MHz)	MAF (dBs/m)	AF (dB/m)
0.01	-33.1	18.4
0.02	-37.2	14.3
0.03	-38.2	13.3
0.05	-39.8	11.7
0.1	-40.1	11.4
0.2	-40.3	11.2
0.3	-40.3	11.2
0.5	-40.3	11.2
0.7	-40.3	11.2
1	-40.1	11.4
2	-40.0	11.5
3	-40.0	11.5
4	-40.1	11.4
5	-40.2	11.3
6	-40.4	11.1
7	-40.4	11.1
8	-40.4	11.1
9	-40.5	11.0
10	-40.5	11.0
20	-41.5	10.0
30	-43.5	8.0

10.4 For ITL #1356 Biconical Antenna

Frequency (MHz)	AF (dB/m)
30	13.00
35	10.89
40	10.59
45	10.63
50	10.12
60	9.26
70	7.74
80	6.63
90	8.23
100	11.12
120	13.16
140	13.07
160	14.80
180	16.95
200	17.17

10.5 For ITL # 1349 Log Periodic Antenna

Frequency (MHz)	AF (dB/m)
200	11.58
250	12.04
300	14.76
400	15.55
500	17.85
600	18.66
700	20.87
800	21.15
900	22.32
1000	24.22

10.6 For ITL # 1352 1-18 GHz Horn Antenna

Frequency (MHz)	AF (dB/m)		Frequency (MHz)	AF (dB/m)
0.75	25		9.5	38
1.0	23.5		10.0	38.5
1.5	26.0		10.5	38.5
2.0	29.0		11.0	38.5
2.5	27.5		11.5	38.5
3.0	30.0		12.0	38.0
3.5	31.5		12.5	38.5
4.0	32.5		13.0	40.0
4.5	32.5		13.5	41.0
5.0	33.0		14.0	40.0
5.5	35.0		14.5	39.0
6.0	36.5		15.0	38.0
6.5	36.5		15.5	37.5
7.0	37.5		16.0	37.5
7.5	37.5		16.5	39.0
8.0	37.5		17.0	40.0
8.5	38.0		17.5	42.0
9.0	37.5		18.0	42.5