



DATE: 19 August 2012

I.T.L. (PRODUCT TESTING) LTD.
FCC Radio Test Report
for
The Stanley Works Israel Ltd.

Equipment under test:

Stanley Guard Main Unit

Written by:

I. Smilansky, Documentation

Approved by:

A. Sharabi, Test Engineer

Approved by:

I. Raz, EMC Laboratory Manager

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This report relates only to items tested.



Measurement/Technical Report for
The Stanley Works Israel Ltd.
Stanley Guard Main Unit
and Stanley Guard User's Tag

FCC ID: GDOICS310000

This report concerns: Original Grant: X
 Class I change:
 Class II change:

Equipment type: Part 15 Low Power Transmitter Below 1705 kHz

47CFR15 Section 15.205; 15.209

Measurement procedure used is ANSI C63.4-2003.

Application for Certification
prepared by:
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Applicant for this device:
(different from "prepared by")
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1. General Information

1.1 Administrative Information

Manufacturer: The Stanley Works Israel Ltd.

Manufacturer's Address: 19 Ha'Melacha St.
New Industrial Zone,
Rosh Ha'Ayin, 48091
Israel
Tel: +972-3-902-0200
Fax: +972-3-902-0222

Manufacturer's Representative: Irit Teerosh

Equipment Under Test (E.U.T): Stanley Guard Main Unit

Equipment Model No.: N/A

Equipment Serial No.: Not Designated

Date of Receipt of E.U.T: 20.02.11

Start of Test: 20.02.12

End of Test: 22.02.12

Test Laboratory Location: I.T.L (Product Testing) Ltd.
Kfar Bin Nun,
ISRAEL 99780

Test Specifications: FCC Part 15 Subpart C



1.2 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. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), IC File No.: 46405-4025; Site No. IC 4025B-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.



1.3 *Product Description*

An inventory control system for reducing tool loss in jobsites during working hours.

The system contains the main unit which interacts with other system components and provides the logic that validates the functionality.

The main unit interacts with user tags (LF 125KHz passive RFID tags) to identify users and tool tags (2.4GHz active tags) to identify objects.

The product is supplied with AC/DC power adaptor for battery charging and a USB cable for PC connection.

1.4 *Test Methodology*

Radiated testing was performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 *Test Facility*

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing September 06, 2009).

I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

1.6 *Measurement Uncertainty*

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):

± 4.96 dB



2. System Test Configuration

2.1 ***Justification***

Unit was tested while it was positioned and operated as the installation requires

2.2 ***EUT Exercise Software***

Original software was used.

2.3 ***Special Accessories***

No special accessories were needed.

2.4 ***Equipment Modifications***

No modifications were needed in order to achieve compliance

2.5 ***Configuration of Tested System***

(Unit on the table with internal antenna and internal 6V battery)

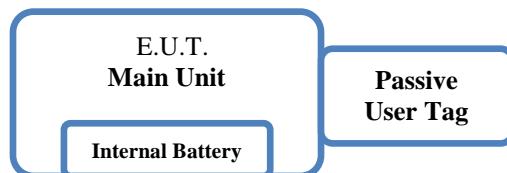


Figure 1. Configuration of Tested System



3. Test Set-up Photos



Figure 2. Radiated Emission Test



STANLEY

Stanley Guard Main Unit Charge Mode

Date : 19th August, 2012

Federal Communications Commission
Authorization and Evaluation Division

I hereby declare that the Stanley Guard Main Unit Low Power Transmitter,
FCC ID: GDOICS310000, does not transmit during the charging operation of the Stanley
Guard Main Unit.

Sincerely,

Signature: _____

Irit Teerosh
The Stanley Works Israel Ltd
19 Ha'Melacha St.
New Industrial Zone
Rosh Ha'Ayin, 48091
Israel

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5. Field Strength of Fundamental

5.1 Test Specification

F.C.C., Part 15, Subpart C

5.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.
The E.U.T. was placed on a non-conductive table, 0.8 meters above the O.A.T.S. ground plane.
The EMI receiver was set to the E.U.T. Fundamental Frequency (117 kHz) and Peak Detection.
The distance between the E.U.T. and test antenna was 3 meters.
The turntable and antenna were adjusted for maximum level reading on the EMI receiver. The loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter.

5.3 Test Results

Frequency (kHz)	Reading (dB μ V/m)	Specification (dB μ V/m)	Margin (dB)
117.14	79.7	106.2	-26.5

Figure 3 - Field Strength of Fundamental Test Results Table

JUDGEMENT: Passed by 26.5 dB

The EUT met the FCC Part 15, Subpart C specification requirements.

The details of the highest emissions are given in *Figure 4*.

TEST PERSONNEL:

Tester Signature:  Date: 30.07.12

Typed/Printed Name: A. Sharabi



Field Strength of Fundamental

E.U.T Description Stanley Guard Main Unit
Serial Number: Not Designated

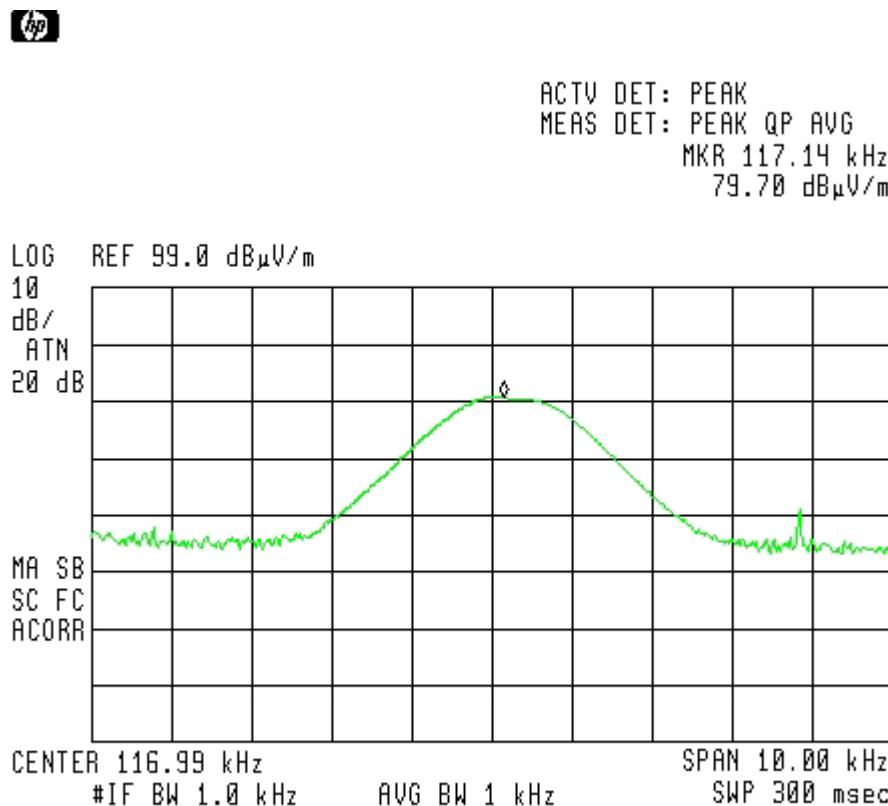


Figure 4. Field Strength of Fundamental.
Detector: Peak



5.4 **Test Instrumentation Used, Field Strength of Fundamental**

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	December 12, 2011	1 year
RF Section	HP	85420E	3705A00248	December 12, 2011	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 19, 2011	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 5 - Test Equipment Used



6. Radiated Emission, 9 kHz – 30 MHz

6.1 ***Test Specification***

9 kHz-30 MHz, FCC, Part 15, Subpart C, Section 209

6.2 ***Test Procedure***

The E.U.T. operation mode and test set-up are as described in Section 3.

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 configuration tested is shown in Figure 2.

The frequency range 9 kHz-30 MHz was scanned.

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.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter at a distance of 10 meters.

The E.U.T. was operated at the frequency of 117 KHz. This frequency was measured using a peak detector.

6.3 ***Test Results***

JUDGEMENT: Passed by 27.0 dB

The EUT was tested and it met the requirements of the FCC Part 15, Subpart C, specification.

TEST PERSONNEL:

Tester Signature: 

Date: 30.07.12

Typed/Printed Name: A. Sharabi



Radiated Emission

E.U.T Description Stanley Guard Main Unit
Serial Number: Not Designated

Specification: FCC Part 15, Subpart C

Antenna: 3 meters distance Frequency Range: 9 kHz to 30 MHz
Detectors: Peak

Frequency (kHz)	Peak Reading (dB μ V/m)	Specification (dB μ V/m)	Margin (dB)
350.0	58.9	96.7	-37.8
1050.0	40.8	67.8	-27.0
1288.0	35.8	65.4	-29.6

Figure 6. Radiated Emission.
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.



6.4 **Test Instrumentation Used, Radiated Measurements**

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	December 12, 2011	1 year
RF Section	HP	85420E	3705A00248	December 12, 2011	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 19, 2011	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A

Figure 7 - Test Equipment Used

6.5 **Field Strength Calculation**

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

$$FS = RA + AF + CF$$

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

No external pre-amplifiers are used.



7. Spurious Radiated Emission

7.1 **Test Specification**

30 - 1000 MHz, F.C.C., Part 15, Subpart C

7.2 **Test Procedure**

The E.U.T. operation mode and test set-up are as described in Section 3. See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

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 signals from the list of the highest emissions were verified and the list was updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

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.

7.3 **Test Results**

JUDGEMENT: Passed

The EUT met the requirements of the F.C.C. Part 15, Subpart C, specification.

No signals were detected in the frequency range of 30 -1000 MHz.

TEST PERSONNEL:

Tester Signature: 

Date: 30.07.12

Typed/Printed Name: A. Sharabi



7.4 ***Test Instrumentation Used, Radiated Measurements***

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	December 12, 2011	1 year
RF Section	HP	85420E	3705A00248	December 12, 2010	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	November 12, 2011	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 29, 2011	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	LaserJet 2200	JPKGC19982	N/A	N/A

Figure 8 - Test Equipment Used



8. APPENDIX A - CORRECTION FACTORS

8.1 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".



8.2 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".



8.3 Correction factors for

BICONICAL ANTENNA

**Type BCD-235/B,
at 3 meter range**

FREQUENCY (MHz)	AFE (dB/m)
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

NOTES:

1. Antenna serial number is 1041.
2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".



8.4 Correction factors for ACTIVE LOOP ANTENNA

Model 6502

S/N 9506-2950

FREQUENCY (MHz)	Magnetic Antenna Factor (dB)	Electric Antenna Factor (dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2