TEST REPORT
IEC 60 950-22
Information technology equipment
Safety – Part 22: Equipment to be installed outdoors

Report Reference No. ..... :	S143891.01 (Attachment to Report No. S143890.01)
Date of issue ..... :	30 October 2014
Total number of pages	19
Testing Laboratory ..... :	I.T.L (PRODUCT TESTING) Ltd.
Address ..... :	1 Bat-Sheva St. POB 87 Lod 7116002 ISRAEL
Applicant's name ..... :	Starcom Systems Ltd.
Address ..... :	33 Jabotinsky St., Ramat Gan 52511, Israel
Test specification:	
Standard ..... :	EN 60950-22: 2006 + A11: 2008
Test procedure ..... :	PM120
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_22A
Test Report Form(s) Originator ..... :	The Standards Institution of Israel Ltd.
Master TRF ..... :	Dated 2007-03

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description ..... :	GPS Container Tracker
Trade Mark ..... :	
Manufacturer ..... :	Starcom Systems Ltd., 33 Jabotinsky St., Ramat Gan 52511, Israel
Model/Type reference ..... :	Triton R
Ratings ..... :	No rating, no connection to mains. Micro USB input or internally battery powered

Testing procedure and testing location:	
☒ Testing Laboratory:	I.T.L (Product Testing) Ltd.
Testing location/ address.....:	1 Bat Sheva St., Lod 7116002, Israel
☐ Associated CB Test Laboratory:	
Testing location/ address.....:	
Tested by (name + signature).....:	Vladimir Chernikh
Approved by (+ signature) .....:	Yigal Cohen
☐ Testing procedure: TMP	
Tested by (name + signature).....:	
Approved by (+ signature) .....:	
Testing location/ address.....:	
☐ Testing procedure: WMT	
Tested by (name + signature).....:	
Witnessed by (+ signature).....:	
Approved by (+ signature) .....:	
Testing location/ address.....:	
☐ Testing procedure: SMT	
Tested by (name + signature).....:	
Approved by (+ signature) .....:	
Supervised by (+ signature).....:	
Testing location/ address.....:	
☐ Testing procedure: RMT	
Tested by (name + signature).....:	
Approved by (+ signature) .....:	
Supervised by (+ signature).....:	
Testing location/ address.....:	

Summary of testing:	
Tests performed (name of test and test clause): IEC 60529 IP65 test	Testing location: I.T.L (PRODUCT TESTING) Ltd. 1 Bat-Sheva St. Lod 7116002 ISRAEL
Summary of compliance with National Differences: CENELEC Common Differences as listed in the end of this report.	
Copy of marking plate Refer to EN 60950-1 report S143890.01	

Test item particulars ..... :	
Temperature range ..... :	-40 to +60degC
Overvoltage category ..... :	☐ OVC I ☐ OVC II ☐ OVC III ☐ OVC IV N/A, SELV LPS powered
IP protection class ..... :	IP65
Possible test case verdicts:	
- test case does not apply to the test object ..... :	N/A
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)
Testing ..... :	
Date of receipt of test item ..... :	10 September 2014
Date (s) of performance of tests ..... :	15 September 2014

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

This Test Report Form is intended for the investigation of safety of equipment to be installed outdoors in accordance with IEC 60950-22. It can only be used together with the IEC 60950-1 requirements.

4	CONDITIONS FOR OUTDOOR EQUIPMENT		P
4.1	Ambient air temperature		P
	Suitability for use at any temperature in the range specified by the manufacturer. If not specified by the manufacturer, the range is taken as -33°C to +40°C	Unit was evaluated for operating ambient -40°C to +60°C	P
4.2	AC mains supply		N/A
	Suitability for the highest Overvoltage Category expected in the installation location	Not connected to AC	N/A
	Components used to reduce the Overvoltage Category comply with IEC 61643-series		N/A
	Reference to installation instructions .....:		N/A
4.3	Rise of earth potential		N/A
	Special earthing conditions	Class III, no earthing	N/A
	Reference to installation instructions .....:		N/A
5	MARKING AND INSTRUCTIONS		P
	Special installation features for protection from conditions in the OUTDOOR LOCATION (see 1.7.2 of IEC 60950-1)		P
	OUTDOOR ENCLOSURE classification according to IEC 60529 (IP Code)	IP rating specified in manual	P

6	PROTECTION FROM ELECTRICAL SHOCK IN AN OUTDOOR LOCATION		P
6.1	Voltage limits of user-accessible parts in OUTDOOR LOCATIONS (2.2.2 and 2.2.3 of IEC 60950-1 with voltage limits of IEC60950-22)		P
	Voltages under normal conditions (V).....:	Accessible voltages do not exceed 5VDC	P
	Voltages under fault conditions (V).....:	Accessible voltages do not exceed 5VDC	P
6.2	Limited current circuits in outdoor locations		N/A
	The requirements of 2.4 of IEC60950-1 apply without change	Not evaluated for Limited current circuits	N/A
7	WIRING TERMINALS FOR CONNECTION OF EXTERNAL CONDUCTORS		N/A
	The mains supply terminations powered via the normal building installation wiring are as specified in 3.3 of IEC 60950-1		N/A
	The mains supply terminations powered directly from the mains distribution system are as specified in IEC 60364		N/A
8	CONSTRUCTION REQUIREMENTS FOR OURDOOR ENCLOSURES		P
8.1	General		P
	Protection against corrosion by use of suitable materials or by application of a protective coating	Plastic enclosure	N/A

	Parts serving as a functional part of an OUTDOOR ENCLOSURE (e.g., dials, connectors, etc.) comply with the same environmental protection requirements as for the OUTDOOR ENCLOSURE		P
	Use of OUTDOOR ENCLOSURE to carry current during normal operation	Plastic enclosure	N/A
	Connection of a conductive part of an OUTDOOR ENCLOSURE to protective earth for carrying fault currents (see 2.6 of IEC 60950-1 and 8.3 of this standard)	Plastic enclosure	N/A
8.2	Resistance to ultra-violet radiation		P
	Resistance of non-metallic parts of an OUTDOOR ENCLOSURE to degradation by ultra-violet (UV) radiation	Manufacturer declares compliance with the UV resistance requirements	N/A
	Parts providing mechanical support:		N/A
	Tensile strength test (ISO 527)		N/A
	Flexural strength test (ISO 178)		N/A
	Parts providing impact resistance:		N/A
	Charpy impact test (ISO 179)		N/A
	Izod impact test (ISO 180)		N/A
	Tensile impact test (ISO 8256)		N/A
	All parts:		N/A
	Flammability classification (1.2.12 and annex A of IEC 60950-1)		N/A
8.3	Resistance to corrosion		N/A
8.3.1	General	Plastic enclosure	N/A
	Resistance of metallic parts of an OUTDOOR ENCLOSURE to the effects of water-borne contaminants		N/A
	Alternate method for 8.3.2-8.3.4 (IEC 61587-1)		N/A
8.3.2	Test apparatus	Plastic enclosure	N/A
	Salt-spray test (IEC 60068-2-11)		N/A
	Test in a water-saturated sulphur dioxide atmosphere (water-saturated sulphur dioxide atmosphere as described in Annex A; chamber as described in ISO 3231)		N/A
8.3.3	Test procedure	Plastic enclosure	N/A
8.3.4	Compliance criteria	Plastic enclosure	N/A
8.4	Bottoms of FIRE ENCLOSURES		N/A
	Comply with 4.6.2 of IEC 60950-1	No fire enclosure	N/A
	Bottom of FIRE ENCLOSURE of OUTDOOR EQUIPMENT mounted directly and permanently on a non-combustible surface (e.g., concrete or metal)		N/A
8.5	Gaskets		N/A

	If gaskets are used as the method for protection against the ingress of potential contaminants, requirements of 8.5.1 through 8.5.3 apply	No gaskets	N/A
8.5.1	General		N/A
8.5.2	Oil resistance		N/A
8.5.3	Securing means		N/A

9	PROTECTION OF EQUIPMENT WITHIN AN OUTDOOR ENCLOSURE		P
9.1	Protection from moisture (see Table 2)	Unit was tested for IPX5 with acceptable results, detachable protective covers were installed in place. Manual contains a statement that unit complies with IP65 rating only with the covers in place	P
9.2	Protection from plants and vermin	Evaluated by inspection, enclosure prevents ingress of plants and vermin	P
9.3	Protection from excessive dust	Unit was tested for IP6X with acceptable results, detachable protective covers were installed in place. Manual contains a statement that unit complies with IP65 rating only with the covers in place. Triton is assembled of 3 separate compartments: main unit, battery unit, “Tail”. Main unit has same construction as battery unit and represented battery unit during testing. Unit volume evaluated as follows: Main Unit, battery unit approximately 0.19l “Tail” unit approximately 0.13l. Test applied as follows: Main Unit at flow rate 0.2 l/m, duration 2h, pressure 1.6kPa Tail unit at flow rate 0.2 l/m, duration 2h, pressure 0.3kPa. There was no ingress of dust into the unit.	P
10	MECHANICAL STRENGTH OF ENCLOSURES		P
10.1	General	Plastic enclosure is of adequate mechanical strength	P
10.2	Impact test (4.2.5 of IEC 60950-1)	Applied at -40degC, there was no adverse effect	P
	Compliance criteria:		P

	- after test the level of protection remains in accordance with 9.1of this standard		P
	- after test the requirements of 4.2.1 of IEC 60950-1 are met		P
11	OUTDOOR EQUIPMENT CONTAINING VENTED BATTERIES		N/A
	Adequate ventilation in the compartment housing a vented battery, where gassing is possible during normal usage or over-charging	No vented batteries employed	N/A
	Protection against the risk of ignition of local concentrations of hydrogen and oxygen in a compartment containing both a battery and electrical components		N/A
	Hydrogen gas concentration measurement test		N/A
	Measured hydrogen gas concentration (% by volume) ..... :		—
	Max. allowed gas concentration for the mixture location in proximity to an ignition source (% by volume) ..... :		—
	Max. allowed gas concentration for the mixture location not in proximity to an ignition source (% by volume) ..... :		—
	Overcharging of rechargeable battery (see 4.3.8 of IEC 60950-1)		N/A
A	ANNEX A, WATER-SATURATED SULPHUR DIOXIDE ATMOSPHERE (see 8.3.2 and 8.3.3)		N/A

B	ANNEX B, WATER SPRAY TEST (see 9.1)		N/A

C	ANNEX C, ULTRAVIOLET LIGHT CONDITIONING TEST (see 8.2)		N/A
C.1	Test apparatus .....:		N/A
C.2	Mounting of test samples .....:		N/A
C.3	Carbon-arc light-exposure apparatus .....:		N/A
C.4	Xenon-arc light-exposure apparatus.....:		N/A
D	ANNEX D, GASKET TESTS (see 8.5)		N/A
D.1	Gasket tests		N/A
D.2	Tensile strength and elongation tests (for gaskets that can stretch)		N/A
	Tensile strength (%) .....:		N/A
	Elongation (%) .....:		N/A
	Visible deterioration, deformation, melting, cracking or hardening of the material .....:		N/A
D.3	Compression test (for gaskets with closed cell construction)		N/A
	Initial thickness of the specimen (mm) .....:		N/A

	Thickness of the specimen after test a) (mm), compression set after test a) (%).....:		N/A
	Thickness of the specimen after test b) (mm), compression set after test b) (%).....:		N/A
	Thickness of the specimen after test c) (mm), compression set after test c) (%).....:		N/A
	Visible cracks or deterioration .....:		N/A
D.4	Oil immersion test		N/A
	Swelling (%).....:		N/A
	Shrinking (%).....:		N/A

E	ANNEX E, RATIONALE		—
E.1	General		—
E.2	Electric shock		—
E.3	Energy related hazards		—
E.4	Fire		—
E.5	Mechanical hazards		—
E.6	Heat related hazards		—
E.7	Radiation		—
E.8	Chemical hazards		—
E.9	Biological hazards		—
E.10	Explosion hazards		—

IEC 60950-22:2005 – COMMON MODIFICATIONS		
Contents	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions	P
General	Delete all the “country” notes in the reference document according to the following list: 4.1 Note 3 4.3 Note 8.5 Note 10.2 Note D.3 Note D.4 Note	P

ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS	—

ZB	SPECIAL NATIONAL CONDITIONS		P
4.1	In Finland, Norway and Sweden, the temperature in winter may be extremely low. For OUTDOOR EQUIPMENT this will demand special design so that the equipment can withstand transport, erection and operation/service at temperatures down to -50°C	No special design required per Amendment A11:2008	N/A
10.2	In Finland, Norway and Sweden there are additional requirements for the minimum ambient temperature. See 4.1 of this annex.	No special design required per Amendment A11:2008	N/A
D.3	In Finland, Norway and Sweden there are additional requirements for the minimum ambient temperature. See 4.1 of this annex.	No special design required per Amendment A11:2008	N/A

Amendment A11: 2008 to EN 60950-22: 2006			
ZB	SPECIAL NATIONAL CONDITIONS		P
	In Annex ZB, the special national conditions for Finland, Norway and Sweden regarding Subclauses 4.1, 10.2 & D.3 and “There are no special national conditions for this European Standard”.	Considered	P

8.2	TABLE: Resistance to ultra-violet radiation	
8.2a)	Tensile strength test (ISO 527)	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples.....:		—
Conditioning for Set 1 of samples.....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Tensile strength (MPa)	Test sample #	Tensile strength (MPa)

Arithmetic mean for Set 1 (MPa) .....:	
Arithmetic mean for Set 2 (MPa) .....:	
Retention (%).....:	

Supplementary information:

8.2	TABLE: Resistance to ultra-violet radiation	
8.2b)	Flexural strength test (ISO 178)	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples.....:		—
Conditioning for Set 1 of samples.....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Flexural strength (MPa)	Test sample #	Flexural strength (MPa)

Arithmetic mean for Set 1 (MPa) .....:	
Arithmetic mean for Set 2 (MPa) .....:	
Retention (%).....:	

Supplementary information:

8.2	TABLE: Resistance to ultra-violet radiation	
8.2c)	Charpy impact test (ISO 179) - unnotched	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples.....:		—
Conditioning for Set 1 of samples.....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (according to Tables 2 and 3 of ISO 179) .....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Charpy impact strength (kJ/m^2)	Test sample #	Charpy impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2).....:	
Arithmetic mean for Set 2 (kJ/m^2).....:	
Retention (%).....:	

Supplementary information:

8.2	TABLE: Resistance to ultra-violet radiation	
8.2d)	Charpy impact test (ISO 179) - notched	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples.....:		—
Conditioning for Set 1 of samples.....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (according to Tables 2 and 3 of ISO 179) .....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Charpy impact strength (kJ/m^2)	Test sample #	Charpy impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2).....:	
Arithmetic mean for Set 2 (kJ/m^2).....:	
Retention (%).....:	

Supplementary information:

8.2	TABLE: Resistance to ultra-violet radiation	
8.2e)	Izod impact test (ISO 180) - unnotched	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples.....:		—
Conditioning for Set 1 of samples.....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (according to Table 1 of ISO 180) .....:		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Izod impact strength (kJ/m^2)	Test sample #	Izod impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2).....:	
Arithmetic mean for Set 2 (kJ/m^2).....:	
Retention (%).....:	

Supplementary information:

8.2	TABLE: Resistance to ultra-violet radiation	
8.2f)	Izod impact test (ISO 180) - notched	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples.....:		—
Conditioning for Set 1 of samples.....:		—

Conditioning for Set 2 of samples (including Annex C)..... :		—
Test method (according to Table 1 of ISO 180) ..... :		—
Test conditions (T °C, RH %)..... :		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Izod impact strength (kJ/m^2)	Test sample #	Izod impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2)..... :	
Arithmetic mean for Set 2 (kJ/m^2)..... :	
Retention (%) ..... :	

Supplementary information:

8.2	TABLE: Resistance to ultra-violet radiation	
8.2g)	Tensile impact test (ISO 8256) - unnotched	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples.....:		—
Conditioning for Set 1 of samples.....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (A or B)		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Tensile impact strength (kJ/m^2)	Test sample #	Tensile impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2).....:	
Arithmetic mean for Set 2 (kJ/m^2).....:	
Retention (%) .....:	

Supplementary information:

8.2	TABLE: Resistance to ultra-violet radiation	
8.2h)	Tensile impact test (ISO 8256) - notched	N/A
Material identification (manufacturer, type designation) .....:		—
Shape and dimensions of test samples.....:		—
Conditioning for Set 1 of samples.....:		—
Conditioning for Set 2 of samples (including Annex C).....:		—
Test method (A or B)		—
Test conditions (T °C, RH %).....:		—

Set 1 (without Annex C conditioning)		Set 2 (after Annex C conditioning)	
Test sample #	Tensile impact strength (kJ/m^2)	Test sample #	Tensile impact strength (kJ/m^2)

Arithmetic mean for Set 1 (kJ/m^2).....:	
Arithmetic mean for Set 2 (kJ/m^2).....:	
Retention (%).....:	

Supplementary information:

	CENELC EN 60950-22/A11 :2008		P
	In Annex ZB, **delete** the special national conditions for Finland, Norway and Sweden regarding Subclauses 4.1, 10.2 & D.3 and **add** “There are no special national conditions for this European Standard”.	Considered	P

End of Test Report.