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TEST REPORT

IEC 60950-1: 2005 (2nd Edition)
Information technology equipment – Safety –
Part 1: General requirements

Report Reference No.....:	127761D
Date of issue.....:	27.08.2009
Total number of pages	50 + pages as indicated in Summary of Testing
CB/CCA Testing Laboratory.....:	Nemko Oy
Address .....:	Perkkaantie 11, FI-02601 Espoo, Finland
Applicant's name.....:	Satel Oy
Address .....:	Meriniitynkatu 17, FI-24100 Salo, Finland
Manufacturer's name .....:	Same as applicant.
Address .....:	
Factory's name .....:	Same as applicant.
Address .....:	
Test specification:	
Standard.....:	IEC 60950-1:2005 (2nd Edition)
Test procedure .....:	National
Non-standard test method……..:	N/A
Test Report Form No.....:	IECEN60950_1C
Test Report Form(s) Originator .....:	SGS Fimko Ltd (edited by Nemko Oy)
Master TRF .....:	Dated 2007-06 (2009-01)

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.

If this Test Report Form is used by non-CCA members, the CIG logo and the reference to the CCA Procedure shall be removed.
This report is not valid as a CCA Test Report unless signed by an approved CCA Testing Laboratory and appended to a CCA Test Certificate issued by an NCB in accordance with CCA.

Test item description .....:	Radio modem module (Radio unit, transceiver)
Trade Mark .....:	SATELLAR RU-XXXX
Manufacturer .....:	Satel Oy
Model/Type reference.....:	SATEL-TA12
Ratings .....:	9-30V⎓, max. 1.1A

Testing procedure and testing location:	
☒ **CB/CCA Testing Laboratory**:	
Testing location/ address ..... :	See page 1.
☐ **Associated CB Laboratory:**	
Testing location/ address ..... :	
Tested by (name + signature) ..... :	Timo Leismala
Approved by (name + signature) . :	Jens Köchel
☐ Testing procedure: TMP	
Tested by (name + signature) ..... :	
Approved by (name + signature) .. :	
Testing location/ address ..... :	
☐ Testing procedure: WMT	
Tested by (name + signature) ..... :	
Witnessed by (name + signature) :	
Approved by (name + signature) . :	
Testing location/ address ..... :	
☐ Testing procedure: SMT	
Tested by (name + signature) ..... :	
Approved by (name + signature) .. :	
Supervised by (name + signature):	
Testing location/ address ..... :	
☐ Testing procedure: RMT	
Tested by (name + signature) ..... :	
Approved by (name + signature) .. :	
Supervised by (name + signature):	
Testing location/ address ..... :	

Summary of testing (SOT):

The test report includes following additional documentation:
☐ Technical Annex: -
☒ Photographs: 4 page(s)

Cl. 7.3 - Protection of equipment users from overvoltages on the cable distribution system:
If the equipment is connected to cable distribution systems (i.e. dedicated outdoor antenna for Satel-TA12), the installation instructions contain details how to connect the common earth of the equipment and screen of the coaxial antenna cable to protective earth. It has been assumed that the EUT is earthed as indicated below:

Protective earthing and bonding:
If the equipment is provided with an outdoor antenna, the equipment shall be connected to protective earth as informed in the installation instructions. According to the information provided by the manufacturer, there are three possibilities for connecting the equipment to PE:

1) Mounting to protective earthed DIN rail is performed by fixing DIN rail adapters to the equipment. The DIN rail mounting adapters are of uncoated stainless steel that are fixed to the equipment by using 3mm screws (2 pcs.).
2) Mounting to protective earthed installation plate of an installation cabinet. An installation plate (aluminium / stainless steel) for the EUT is fixed to the equipment by using screws. The installation plate of the EUT is then fixed to the installation plate of the cabinet.
3) The EUT is directly fixed to a protective earthed installation plate by using screws.

The product ☒ fulfils / ☐ does not fulfill the requirements of EN 60950-1:2006.

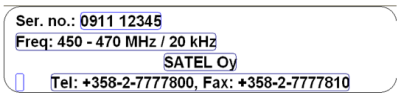
Tests performed (name of test and test clause):	**Testing location:**
All tests as indicated in the test report:	See page 1.

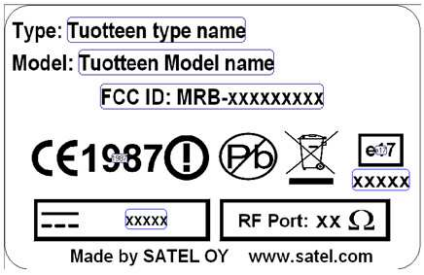
Summary of compliance with National Differences:

☒ CENELEC common modifications ☒ NO ☒ SE ☒ FI ☒ DK ☒ UK
☒ IE ☒ DE ☒ CH ☒ ES
☐ US ☐ CA ☐ KR ☐ other:

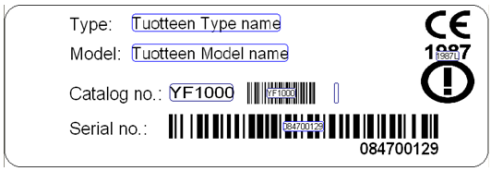
Copy of marking plate

SATEL-TA12:





Type designation is SATEL-TA12 in the final product. Trade name is SATELLAR RU-XXXX in the final product, where XXXX is used for distinguishing different variants.



Test item particulars (TIP):	
Equipment mobility ..... :	☐ movable ☐ hand-held ☐ transportable ☐ stationary ☒ for building-in ☐ direct plug-in
Supply(s) ..... :	☐ a.c. mains ☐ d.c. mains ☒ SELV ☐ TNV ☐ battery operated ☐ LPS ☐ secondary hazardous voltage ☐ other:
Connection to the supply ..... :	☐ pluggable equipment: ☐ type A ☐ type B ☐ permanent connection ☐ detachable power supply cord ☐ non-detachable power supply cord ☒ not directly connected to the mains
Operating condition ..... :	☒ continuous ☐ rated operating / resting time:
Access area ..... :	☒ operator access area ☐ restricted access location ☐ service access area
Overvoltage category (OVC) ..... :	N/A
Mains supply tolerance (%) or absolute mains supply values (V) ..... :	9-30V ⎓, tolerance not declared
Tested power systems ..... :	N/A
IT testing, phase-phase voltage (V) ..... :	N/A
Class of equipment ..... :	☐ Class I ☐ Class II ☒ Class III ☐ Not classified
Considered current rating (A) ..... :	N/A
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
IP protection class ..... :	IP52 (not tested, declared by the manufacturer)
Max. altitude during operation (m) ..... :	2000 m
Altitude of test laboratory (m) ..... :	approx. 3 m
Mass of equipment (kg) ..... :	TA12: 0,30 kg
Ambient temperature during operation (℃) .... :	max. + 55 ℃
Additional requirements as per cl. 1.1.2 ..... :	N/A
Radiation(s) and special hazards ..... :	☐ Laser ☐ UV ☐ Ionizing ☐ CRT ☐ Energy ☐ batteries ☐ moving parts ☐ dust, powder, gases, liquids, oil, grease ☐ heating elements ☐ thermostats ☐ sound pressure ☐ audio amplifier ☐ other:
Output(s) and other connections ..... :	☐ none ☒ SELV ☐ LPS ☒ TNV ☐ secondary hazardous voltage ☐ mains ☐ other:

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 ..... :	
Date(s) of performance of tests ..... :	10.08.2009 - 27.08.2009

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.

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

General product information (GPI):

SATEL-TA12 Radio Unit:

The EUT is a digital radio modem that enables e.g. an independent packet data connection or a point-to-point data link over several kilometres. Different variants of this product cover the frequency range of 380 – 520 MHz. Transmitting power is programmable from 100mW to 1W. The device is capable of operating on 6, 25, 12,5 20, and 25 kHz channel spacings.

The device can be mounted directly on a flat surface (either directly or using a mounting plate) or on a DIN rail. DIN-rail mounting is possible either from the back-side of the device (for local UI use) or from the side of each unit (LED indicators remain visible for the user). The ambient conditions are specified to be -25 ℃ to +55℃.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1	GENERAL		P
1.4	General conditions for test		P
1.4.1	Application of tests		P
1.4.2	Type tests		P
1.4.3	Test samples .....:	As user would receive.	P
1.4.4	Operating parameters for test .....:		P
1.4.5	Supply voltage for test .....:	9 – 30 V d.c.	P
1.4.6	Supply frequency for test .....:	DC equipment.	N/A
1.4.7	Electrical measuring instruments		P
1.4.8	Normal operating voltages		P
1.4.9	Measurement of voltage to earth	DC equipment.	N/A
1.4.10	Loading configuration of the EUT .....:	Transmitting of data continuously; transmitting power was set to maximum (1W).	P
1.4.11	Power from a telecommunication network		N/A
1.4.12	Temperature measurement conditions		P
1.4.12.1	General		P
1.4.12.2	Temperature dependent equipment .....:		N/A
1.4.12.3	Non-temperature dependent equipment .....:	Measurements carried out in +55 ℃.	P
1.4.13	Temperature measurement methods	Thermocouple method.	P
1.4.14	Simulated faults and abnormal operating conditions		P
1.4.15	Compliance by inspection of relevant data	PCB.	P
1.5	Components		P
1.5.1	General		P
	Comply with IEC 60950-1 or relevant component standard	(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components		P
1.5.3	Thermal controls		N/A
1.5.4	Transformers		N/A
1.5.5	Interconnecting cables		N/A
1.5.6	Capacitors bridging insulation		N/A
1.5.7	Resistors bridging insulation		P

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5.7.1	Resistors bridging functional, basic or supplementary insulation	Functional insulation only.	P
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		N/A
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N/A
1.5.8	Components in equipment for IT power systems		N/A
1.5.9	Surge suppressors		N/A
1.5.9.1	General		N/A
1.5.9.2	Protection of VDRs		N/A
1.5.9.3	Bridging of functional insulation by a VDR		N/A
1.5.9.4	Bridging of basic insulation by a VDR		N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A
1.6	Power interface		P
1.6.1	AC power distribution systems	DC equipment.	N/A
1.6.2	Input current	(see appended table 1.6.2)	P
1.6.3	Voltage limit of hand-held equipment	The equipment is not hand-held.	N/A
1.6.4	Neutral conductor		N/A

Equipment	Inv. no.	Date(s)
Digital Multimeter	577	17.-20.08.2009

1.7	Marking and instructions		P
1.7.1	Power rating		P
	Rated voltage(s) or voltage range(s) (V) .....:	9 - 30 V	P
	Symbol for nature of supply, for d.c. only.....:	DC symbol used.	P
	Rated frequency or rated frequency range (Hz) ....:	The equipment is for d.c. supply only.	N/A
	Rated current (mA or A) .....:	Maximum 1.1A.	P
	Manufacturer's name or trade-mark or identification mark .....:	SATELLAR RU-XXXX, where XXXX stands for different variants that have minor effect on electrical safety due to similar construction.	P
	Model identification or type reference .....:	SATEL-TA12	P

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Symbol for Class II equipment only .....:	The equipment is class III.	N/A
	Other markings and symbols .....:		N/A
1.7.2	Safety instructions and marking		N/A
1.7.2.1	General		N/A
1.7.2.2	Disconnect devices	DC equipment.	N/A
1.7.2.3	Overcurrent protective device	DC equipment.	N/A
1.7.2.4	IT power distribution systems		N/A
1.7.2.5	Operator access with a tool		N/A
1.7.2.6	Ozone		N/A
1.7.3	Short duty cycles	The equipment is intended for continuous operation.	N/A
1.7.4	Supply voltage adjustment .....:	Auto-ranging DC input.	N/A
	Methods and means of adjustment; reference to installation instructions .....:		N/A
1.7.5	Power outlets on the equipment .....:		N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference) .....:	SMD soldered-in fuses located inside the equipment and are not intended to be replaced by user or service personnel. No designation is considered to be required.	N/A
1.7.7	Wiring terminals	Refer below:	–
1.7.7.1	Protective earthing and bonding terminals .....:	If the equipment is provided with an outdoor antenna, the equipment shall be connected to protective earth as informed in the installation instructions. No earthing/bonding terminals provided in the equipment. See SOT and also cl. 7.3.	–
1.7.7.2	Terminals for a.c. mains supply conductors	The equipment is not for connection to a.c. mains.	N/A
1.7.7.3	Terminals for d.c. mains supply conductors	The equipment is not for connection to d.c. mains.	N/A
1.7.8	Controls and indicators		P
1.7.8.1	Identification, location and marking .....:	LED indicating function of equipment.	P
1.7.8.2	Colours .....:		N/A
1.7.8.3	Symbols according to IEC 60417.....:		N/A
1.7.8.4	Markings using figures .....:		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.9	Isolation of multiple power sources ..... :		N/A
1.7.10	Thermostats and other regulating devices ..... :		N/A
1.7.11	Durability	Marking withstands rubbing by water (15s) and petroleum spirit (15s).	P
1.7.12	Removable parts		N/A
1.7.13	Replaceable batteries ..... :	No batteries.	N/A
	Language(s) ..... :	English.	—
1.7.14	Equipment for restricted access locations ..... :		N/A

Equipment	Inv. no.	Date(s)

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas		P
2.1.1.1	Access to energized parts		P
	Test by inspection ..... :		P
	Test with test finger (Figure 2A) ..... :		N/A
	Test with test pin (Figure 2B) ..... :		N/A
	Test with test probe (Figure 2C) ..... :		N/A
2.1.1.2	Battery compartments	No batteries.	N/A
2.1.1.3	Access to ELV wiring	SELV only.	N/A
	Working voltage (Vpeak or Vrms); minimum distance through insulation (mm)	(see appended table 2.10.5)	—
2.1.1.4	Access to hazardous voltage circuit wiring	SELV only.	N/A
2.1.1.5	Energy hazards ..... :		N/A
2.1.1.6	Manual controls		N/A
2.1.1.7	Discharge of capacitors in equipment		N/A
	Measured voltage (V); time-constant (s)..... :		—
2.1.1.8	Energy hazards – d.c. mains supply	No mains supply.	N/A
	a) Capacitor connected to the d.c. mains supply .. :		N/A
	b) Internal battery connected to the d.c. mains supply ..... :		N/A
2.1.1.9	Audio amplifiers ..... :	No audio amplifiers in the equipment.	N/A
2.1.2	Protection in service access areas		N/A
2.1.3	Protection in restricted access locations		N/A

Equipment	Inv. no.	Date(s)

2.2	SELV circuits		P
2.2.1	General requirements		P
2.2.2	Voltages under normal conditions (V) ..... :	30 V d.c.	P
2.2.3	Voltages under fault conditions (V) ..... :	30 V d.c.	P
2.2.4	Connection of SELV circuits to other circuits ..... :		P

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Equipment	Inv. no.	Date(s)
Digital oscilloscope	644	25.08.2009
Multimeter	535	25.08.2009

2.3	TNV circuits		P
2.3.1	Limits	If the equipment is provided with a dedicated outdoor antenna, overvoltages due to indirect lightnings can enter into equipment. See SOT and also clauses 1.7.7.1, 7.3.	P
	Type of TNV circuits.....:	TNV-1, earthed.	—
2.3.2	Separation from other circuits and from accessible parts	Refer below:	P
2.3.2.1	General requirements	Only TNV-1 circuits in the equipment. No TNV-2 or TNV-3 circuits. The insulation between TNV-1 – earthed SELV is functional.	P
2.3.2.2	Protection by basic insulation	-	N/A
2.3.2.3	Protection by earthing	-	N/A
2.3.2.4	Protection by other constructions .....:	-	N/A
2.3.3	Separation from hazardous voltages	All circuits are SELV or TNV-1. No circuits containing hazardous voltages.	N/A
	Insulation employed .....:	-	—
2.3.4	Connection of TNV circuits to other circuits	No primary or hazardous voltage circuits delivering power to the equipment.	P
	Insulation employed .....:	-	—
2.3.5	Test for operating voltages generated externally	No TNV-2 or TNV-3 circuits in the equipment.	N/A

2.4	Limited current circuits	SELV circuits only, no LCC. Sub-clauses deleted.	N/A

2.5	Limited power sources		P
	a) Inherently limited output	DC supply for LEDs and adjacent resistors have been evaluated to be a LPS. See appended table 2.5.	P

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	b) Impedance limited output	-	N/A
	c) Regulating network limited output under normal operating and single fault condition	-	N/A
	d) Overcurrent protective device limited output	-	N/A
2.6	Provisions for earthing and bonding		N/A
2.6.1	Protective earthing		N/A
2.6.2	Functional earthing		N/A
2.6.3	Protective earthing and protective bonding conductors		N/A
2.6.3.1	General		N/A
2.6.3.2	Size of protective earthing conductors		N/A
	Rated current (A), cross-sectional area (mm^2), AWG .....:		—
2.6.3.3	Size of protective bonding conductors		N/A
	Rated current (A), cross-sectional area (mm^2), AWG .....:		—
	Protective current rating (A), cross-sectional area (mm^2), AWG.....:		—
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min).....:		N/A
2.6.3.5	Colour of insulation .....:	Direct metallic contact.	N/A
2.6.4	Terminals	Direct metallic contact.	N/A
2.6.4.1	General		N/A
2.6.4.2	Protective earthing and bonding terminals		N/A
	Rated current (A), type, nominal thread diameter (mm).....:		—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		N/A
2.6.5	Integrity of protective earthing		N/A
2.6.5.1	Interconnection of equipment		N/A
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N/A
2.6.5.3	Disconnection of protective earth		N/A
2.6.5.4	Parts that can be removed by an operator		N/A
2.6.5.5	Parts removed during servicing		N/A
2.6.5.6	Corrosion resistance		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
2.6.5.7	Screws for protective bonding		N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system		N/A

Equipment	Inv. no.	Date(s)

2.7	Overcurrent and earth fault protection in primary circuits	No primary circuits. Sub-clauses deleted.	N/A

2.8	Safety interlocks	No safety interlocks. Sub-clauses deleted.	N/A

2.9	Electrical insulation		P
2.9.1	Properties of insulating materials		P
2.9.2	Humidity conditioning	Non hygroscopic insulation materials used (PCB only).	P
	Relative humidity (%), temperature (℃) .... :	-	—
2.9.3	Grade of insulation	Functional.	P
2.9.4	Separation from hazardous voltages	To be evaluated in end-assembly.	N/A
	Method(s) used ..... :	-	—

Equipment	Inv. no.	Date(s)

2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General		P
2.10.1.1	Frequency ..... :	DC supply.	P
2.10.1.2	Pollution degrees ..... :	2	P
2.10.1.3	Reduced values for functional insulation	See 5.3.4.	P
2.10.1.4	Intervening unconnected conductive parts		N/A
2.10.1.5	Insulation with varying dimensions		N/A
2.10.1.6	Special separation requirements		N/A
2.10.1.7	Insulation in circuits generating starting pulses		N/A
2.10.2	Determination of working voltage		P

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Clause	Requirement + Test	Result - Remark	Verdict
2.10.2.1	General		P
2.10.2.2	RMS working voltage		P
2.10.2.3	Peak working voltage		P
2.10.3	Clearances	See 2.10.1.3.	N/A
2.10.3.1	General		N/A
2.10.3.2	Mains transient voltages		N/A
	a) AC mains supply .....:		N/A
	b) Earthed d.c. mains supplies .....:		N/A
	c) Unearthed d.c. mains supplies .....:		N/A
	d) Battery operation .....:		N/A
2.10.3.3	Clearances in primary circuits	(see appended table 2.10.3 and 2.10.4)	N/A
2.10.3.4	Clearances in secondary circuits	(see appended table 2.10.3 and 2.10.4) See 2.10.1.3.	N/A
2.10.3.5	Clearances in circuits having starting pulses	(see appended table 2.10.3 and 2.10.4)	N/A
2.10.3.6	Transients from a.c. mains supply .....:		N/A
2.10.3.7	Transients from d.c. mains supply .....:		N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems .....:		N/A
2.10.3.9	Measurement of transient voltage levels		N/A
	a) Transients from a mains suplply		N/A
	For an a.c. mains supply .....:		N/A
	For a d.c. mains supply .....:		N/A
	b) Transients from a telecommunication network :		N/A
2.10.4	Creepage distances	See 2.10.1.3.	N/A
2.10.4.1	General		N/A
2.10.4.2	Material group and comparative tracking index		N/A
	CTI tests.....:	Material group IIIb is assumed to be used.	—
2.10.4.3	Minimum creepage distances	(see appended table 2.10.3 and 2.10.4)	N/A
2.10.5	Solid insulation		P
2.10.5.1	General		P
2.10.5.2	Distances through insulation	(see appended table 2.10.5)	N/A
2.10.5.3	Insulating compound as solid insulation		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.10.5.4	Semiconductor devices		N/A
2.10.5.5	Cemented joints	(see appended table 2.10.3 and 2.10.4)	N/A
2.10.5.6	Thin sheet material – General		N/A
2.10.5.7	Separable thin sheet material		N/A
	Number of layers (pcs) .....:		—
2.10.5.8	Non-separable thin sheet material		N/A
2.10.5.9	Thin sheet material – standard test procedure		N/A
	Electric strength test	(see appended table 2.10.5)	—
2.10.5.10	Thin sheet material – alternative test procedure		N/A
	Electric strength test	(see appended table 2.10.5)	—
2.10.5.11	Insulation in wound components		N/A
2.10.5.12	Wire in wound components		N/A
	Working voltage .....:		N/A
	a) Basic insulation not under stress .....:		N/A
	b) Basic, supplementary, reinforced insulation .....:		N/A
	c) Compliance with Annex U .....:		N/A
	Two wires in contact inside wound component; angle between 45° and 90° .....:		N/A
2.10.5.13	Wire with solvent-based enamel in wound components		N/A
	Electric strength test	(see appended table 2.10.5)	—
	Routine test		N/A
2.10.5.14	Additional insulation in wound components		N/A
	Working voltage .....:		N/A
	- Basic insulation not under stress .....:		N/A
	- Supplementary, reinforced insulation .....:		N/A
2.10.6	Construction of printed boards		P
2.10.6.1	Uncoated printed boards	(see appended table 2.10.3 and 2.10.4) See 2.10.1.3.	N/A
2.10.6.2	Coated printed boards	(see appended table 2.10.3 and 2.10.4)	N/A
2.10.6.3	Insulation between conductors on the same inner surface of a printed board	(see appended table 2.10.3 and 2.10.4) See 2.10.1.3.	N/A
2.10.6.4	Insulation between conductors on different layers of a printed board	Functional insulation only.	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Distance through insulation	(see appended table 2.10.5)	N/A
	Number of insulation layers (pcs).....:		N/A
2.10.7	Component external terminations	(see appended table 2.10.3 and 2.10.4)	N/A
2.10.8	Tests on coated printed boards and coated components		N/A
2.10.8.1	Sample preparation and preliminary inspection		N/A
2.10.8.2	Thermal conditioning		N/A
2.10.8.3	Electric strength test	(see appended table 5.2)	N/A
2.10.8.4	Abrasion resistance test		N/A
2.10.9	Thermal cycling		N/A
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N/A
2.10.11	Tests for semiconductor devices and cemented joints		N/A
2.10.12	Enclosed and sealed parts		N/A

Equipment	Inv. no.	Date(s)

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	2x5A fuses at the DC input. No internal wires in the equipment.	P
3.1.2	Protection against mechanical damage	No wireways	N/A
3.1.3	Securing of internal wiring	No internal wiring.	N/A
3.1.4	Insulation of conductors	(see appended table 5.2)	N/A
3.1.5	Beads and ceramic insulators		N/A
3.1.6	Screws for electrical contact pressure		P
3.1.7	Insulating materials in electrical connections	Plug-in connectors used.	P
3.1.8	Self-tapping and spaced thread screws		N/A
3.1.9	Termination of conductors		N/A
	10 N pull test		N/A
3.1.10	Sleeving on wiring		N/A

Equipment	Inv. no.	Date(s)

3.2	Connection to a mains supply	Not connected to a mains supply. Sub-clauses deleted.	N/A

3.3	Wiring terminals for connection of external conductors	No wiring terminals. Sub-clauses deleted.	N/A

3.4	Disconnection from the mains supply	Not connected to a mains supply. Sub-clauses deleted.	N/A

3.5	Interconnection of equipment		P
3.5.1	General requirements		P
3.5.2	Types of interconnection circuits ..... :	SELV – SELV	P
3.5.3	ELV circuits as interconnection circuits		N/A
3.5.4	Data ports for additional equipment		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Equipment	Inv. no.	Date(s)

4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N/A
	Angle of 10°	For building-in.	N/A
	Test force (N) .....:	-	N/A

Equipment	Inv. no.	Date(s)

4.2	Mechanical strength		N/A
4.2.1	General	4.2.2 – 4.2.7; the equipment is class III and contains no hazardous voltages and is intended for building-in. Moreover, the related requirements listed in 2.1.1, 2.6.1, 2.10, 3.2.6 and 4.4.1 are not applicable for this equipment.	N/A
4.2.2	Steady force test, 10 N		N/A
4.2.3	Steady force test, 30 N		N/A
4.2.4	Steady force test, 250 N		N/A
4.2.5	Impact test		N/A
	Fall test		N/A
	Swing test		N/A
4.2.6	Drop test; height (mm) .....:		N/A
4.2.7	Stress relief test (℃) ....:		N/A
4.2.8	Cathode ray tubes		N/A
	Picture tube separately certified .....:		N/A
4.2.9	High pressure lamps		N/A
4.2.10	Wall or ceiling mounted equipment; force (N) .....:		N/A

Equipment	Inv. no.	Date(s)

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.3	Design and construction		P
4.3.1	Edges and corners		P
4.3.2	Handles and manual controls; force (N).....:		N/A
4.3.3	Adjustable controls		N/A
4.3.4	Securing of parts		N/A
4.3.5	Connection by plugs and sockets		N/A
4.3.6	Direct plug-in equipment		N/A
	Torque .....:		—
	Compliance with the relevant mains plug standard .....:		N/A
4.3.7	Heating elements in earthed equipment	No heating elements provided.	N/A
4.3.8	Batteries	No batteries.	N/A
	- Overcharging of a rechargeable battery		N/A
	- Unintentional charging of a non-rechargeable battery		N/A
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		N/A
4.3.9	Oil and grease		N/A
4.3.10	Dust, powders, liquids and gases		N/A
4.3.11	Containers for liquids or gases		N/A
4.3.12	Flammable liquids .....:		N/A
	Quantity of liquid (l) .....:		N/A
	Flash point (°C) .....:		N/A
4.3.13	Radiation		N/A
4.3.13.1	General		N/A
4.3.13.2	Ionizing radiation		N/A
	Measured radiation (pA/kg) .....:		—
	Measured high-voltage (kV) .....:		—
	Measured focus voltage (kV) .....:		—
	CRT markings .....:		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		N/A
	Part, property, retention after test, flammability classification .....:		N/A
4.3.13.4	Human exposure to ultraviolet (UV) radiation .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.13.5	Laser (including LEDs)	Diffuse type LEDs are used in the equipment.	P
	Laser class .....:	-	—
4.3.13.6	Other types .....:	SATEL-TA12: Electromagnetic radiation with frequency 380 – 520 MHz. No hazard.	P

Equipment	Inv. no.	Date(s)

4.4	Protection against hazardous moving parts	No moving parts. Sub-clauses deleted.	N/A

4.5	Thermal requirements		P
4.5.1	General		P
4.5.2	Temperature tests		P
	Normal load condition per Annex L .....:	-	—
4.5.3	Temperature limits for materials	(see appended table 4.5)	P
4.5.4	Touch temperature limits	(see appended table 4.5)	N/A
4.5.5	Resistance to abnormal heat .....:	No thermoplastic parts carrying hazardous voltages.	N/A

Equipment	Inv. no.	Date(s)
Datalogger	601	13.08.2009
Temperature / humidity chamber	586	13.08.2009

4.6	Openings in enclosures		P
4.6.1	Top and side openings		P
	Dimensions (mm) .....:		—
4.6.2	Bottoms of fire enclosures		P
	Construction of the bottom, dimensions (mm) .....:	No openings.	—
4.6.3	Doors or covers in fire enclosures	No doors or covers in the fire enclosure.	N/A
4.6.4	Openings in transportable equipment		N/A
4.6.4.1	Constructional design measures		N/A
	Dimensions (mm) .....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
4.6.4.2	Evaluation measures for larger openings		N/A
4.6.4.3	Use of metallized parts		N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature (°C), time (weeks).....:		—

Equipment	Inv. no.	Date(s)

4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame		P
	Method 1, selection and application of components wiring and materials	(see appended table 4.7)	P
	Method 2, application of all of simulated fault condition tests	(see appended table 5.3)	N/A
4.7.2	Conditions for a fire enclosure		P
4.7.2.1	Parts requiring a fire enclosure	All parts except LEDs and adjacent resistors are required to be covered by a fire enclosure unless the equipment is supplied by limited power source (LPS).	P
4.7.2.2	Parts not requiring a fire enclosure	All parts are required to have a fire enclosure except LEDs and adjacent resistors. The supply for these components was evaluated to be a LPS.	P
4.7.3	Materials		P
4.7.3.1	General		P
4.7.3.2	Materials for fire enclosures	See table 4.7.	P
4.7.3.3	Materials for components and other parts outside fire enclosures		P
4.7.3.4	Materials for components and other parts inside fire enclosures	See tables 1.5.1 and 4.7.	P
4.7.3.5	Materials for air filter assemblies		N/A
4.7.3.6	Materials used in high-voltage components		N/A

Equipment	Inv. no.	Date(s)

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current	Touch current and protective conductor current not applicable. Sub-clauses deleted.	N/A
5.2	Electric strength		N/A
5.2.1	General	(see appended table 5.2)	N/A
5.2.2	Test procedure		N/A

Equipment	Inv. no.	Date(s)

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P
5.3.2	Motors		N/A
5.3.3	Transformers		N/A
5.3.4	Functional insulation.....:		P
5.3.5	Electromechanical components		N/A
5.3.6	Audio amplifiers in ITE .....:		N/A
5.3.7	Simulation of faults		P
5.3.8	Unattended equipment		N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions		P
5.3.9.1	During the tests		P
5.3.9.2	After the tests		N/A

Equipment	Inv. no.	Date(s)
Multimeter	577	26.08.2009
Multimeter	535	26.08.2009
Oscilloscope	644	26.08.2009

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Clause	Requirement + Test	Result - Remark	Verdict
6	CONNECTION TO TELECOMMUNICATION NETWORKS	Not connected to telecommunication networks. Sub-clauses deleted.	N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		P
7.1	General	The equipment can be connected to a dedicated outdoor antenna. The equipment is not connected to antenna systems between separate equipment and buildings.	P
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment	No hazardous voltages generated in the equipment. Moreover, the equipment is SELV supplied.	N/A
7.3	Protection of equipment users from overvoltages on the cable distribution system	The equipment can be connected to a dedicated outdoor antenna. Installation instructions contain details how to connect the common earth of the equipment and screen of the coaxial antenna cable to protective earth. The circuit is TNV-1 circuit and the common side of the circuit, accessible metal parts and screen of the coaxial cable are connected to protective earth. As a result, the requirements of cl. 6.2.1 a), b) and c) are not applicable. See SOT.	P
7.4	Insulation between primary circuits and cable distribution systems	No primary circuits in the equipment.	N/A
7.4.1	General	-	N/A
7.4.2	Voltage surge test	-	N/A
7.4.3	Impulse test	-	N/A

Equipment	Inv. no.	Date(s)
-	-	-

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE PCB material V-0. Sub-clauses deleted.		N/A
B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2) No motors. Sub-clauses deleted.		N/A
C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3) No transformers. Sub-clauses deleted.		N/A
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		N/A
D.1	Measuring instrument		N/A
D.2	Alternative measuring instrument		N/A
E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N/A
F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		N/A
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES See 2.10.1.3. Sub-clauses deleted.		N/A
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N/A
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N/A
	Metal(s) used .....:		—
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8) No thermal controls. Sub-clauses deleted.		N/A
L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		N/A
L.1	Typewriters		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
L.2	Adding machines and cash registers		N/A
L.3	Erasers		N/A
L.4	Pencil sharpeners		N/A
L.5	Duplicators and copy machines		N/A
L.6	Motor-operated files		N/A
L.7	Other business equipment		N/A
M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)	No telephone ringing signals. Sub-clauses deleted.	N/A
N	ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)		N/A
N.1	ITU-T impulse test generators		N/A
N.2	IEC 60065 impulse test generator		N/A
P	ANNEX P, NORMATIVE REFERENCES		—
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)	No VDRs used. Sub-clauses deleted.	N/A
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N/A
R.1	Minimum separation distances for unpopulated coated printed boards (see 2.10.6.2)		N/A
R.2	Reduced clearances (see 2.10.3)		N/A
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N/A
S.1	Test equipment		N/A
S.2	Test procedure		N/A
S.3	Examples of waveforms during impulse testing		N/A
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N/A
		See separate test report	—

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Clause	Requirement + Test	Result - Remark	Verdict
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N/A
		See separate test report	—
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		N/A
V.1	Introduction		N/A
V.2	TN power distribution systems		N/A
V.3	TT power distribution systems		N/A
V.4	IT power distribution systems		N/A
W	ANNEX W, SUMMATION OF TOUCH CURRENTS	No touch currents in this equipment. Sub-clauses deleted.	N/A
X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		N/A
X.1	Determination of maximum input current		N/A
X.2	Overload test procedure		N/A
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)	No UV light. Sub-clauses deleted.	N/A
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		N/A
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N/A
BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—

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Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components				P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity[1])
General					
PCB	Several	Several	V-0, CTI > 100, min. 105 ℃	ZPMV2	UL certified
Enclosure	Several	Several	Aluminium, thickness min. 1,5mm	IEC60950-1	Evaluated in equipment
Functional insulation					
N/A					
Basic insulation					
N/A					
Supplementary insulation					
N/A					
Reinforced insulation					
N/A					
[1]) An asterisk indicates a mark which assures the agreed level of surveillance					
Supplementary information: -					

1.6.2	TABLE: Electrical data (in normal conditions)					P
U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status
SATEL-TA12:						
9.0	0.95	1.1	8.6	-	-	Continuous transmitting with full Tx power.
12.0	0.70	1.1	8.4	-	-	Continuous transmitting with full Tx power.
24.0	0.37	1.1	8.9	-	-	Continuous transmitting with full Tx power.
30.0	0.31	1.1	9.3	-	-	Continuous transmitting with full Tx power.
Supplementary information: -						

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Clause	Requirement + Test	Result - Remark	Verdict

2.5	TABLE: limited power sources									P
Circuit	Fault	U_{oc} (V)		I_{sc} (A)		P (VA)		Fuse (A)		
		Mea-sured	Limit	Mea-sured	Limit	Mea-sured	Limit	Value	Limit	
VCC_LOGIC_FPGA	IC20 or IC26 S-c	4.0 V_{DC}	20V_{DC}	4.55A	8.0A	11.4	100	-	-	
VCC_LOGIC_FPGA	Q1 pins 5/6-7/8	3.3 V_{DC}	20V_{DC}	0.9A	8.0A	2.97	100	-	-	
Supplementary information:										

2.10.3 and 2.10.4	TABLE: Working voltage measurements for clearance and creepage distances										–
Condition #	Between	TN-S, TN-C, TN-CS, TT (not corner earthed) Figures V.1, V.2, V.3, V.5		TN-S, TT (corner earthed) Figures V.1, V.6		TN-C (middle point earthed Figure V.4		IT (not corner earthed) Figure V.7		IT (corner earthed) Figure V.8	
		peak	rms	peak	Rms	peak	rms	peak	rms	peak	Rms
Supplementary information: Condition #:											

2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements						N/A
Clearance (cl) and creepage distance (cr) at/of/between:	U_{peak} (V)	U_{rms} (V)	Req. cl. (mm)	Meas. cl. (mm)	Req. cr. (mm)	Meas. cr. (mm)	
Functional insulation:							
N/A							
Basic/supplementary insulation:							
N/A							
Reinforced insulation:							
N/A							
Supplementary information:							

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Clause	Requirement + Test	Result - Remark	Verdict

2.10.5	TABLE: Distance through insulation measurements				N/A
Distance through insulation (DTI) at/of:	U_{peak} (V)	U_{rms} (V)	Test voltage (V)	Req. DTI (mm)	DTI (mm)
Basic insulation:					
N/A					
Supplementary insulation:					
N/A					
Reinforced insulation:					
N/A					
Supplementary information:					

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Clause	Requirement + Test	Result - Remark	Verdict

4.3.8	TABLE: Batteries		N/A
The tests of 4.3.8 are applicable only when appropriate battery data is not available		No batteries in the equipment.	N/A
Is it possible to install the battery in a reverse polarity position?			N/A

	Non-rechargeable batteries			Rechargeable batteries					
	Discharging		Un-intentional charging	Charging		Discharging		Reversed charging	
	Meas. current	Manuf. Specs.		Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.
Max. current during normal condition									
Max. current during fault condition									

Test results:		Verdict
- Chemical leaks	No batteries in the equipment.	N/A
- Explosion of the battery		N/A
- Emission of flame or expulsion of molten metal		N/A
- Electric strength tests of equipment after completion of tests		N/A
Supplementary information:		

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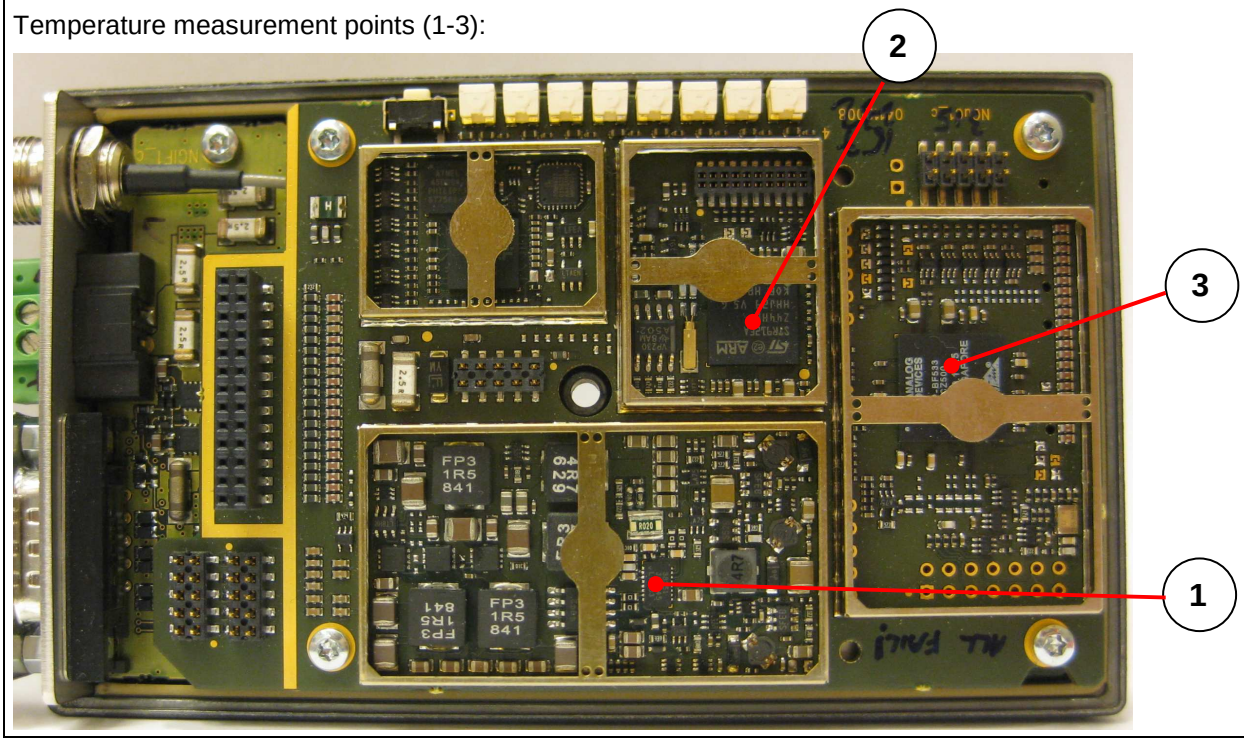
Clause	Requirement + Test	Result - Remark	Verdict

4.5	TABLE: Thermal requirements						P
	Supply voltage (V) .....:	9,0	30,0	30,0 [1)]	–	–	—
	Ambient T_{min} (°C) .....:	–	–	–	–	–	—
	Ambient T_{max} (°C) .....:	55,0	55,0	55,0	–	–	—
Maximum measured temperature T of part/at::		T (°C)					Allowed T_{max} (°C)
Normal condition (Tx power 1W, continuous transmission of data):		–	–	–	–	–	–
IC, see measurement point 1 below		75,4	91,0	79,3	–	–	105
IC, see measurement point 2 below		78,8	86,5	77,0	–	–	105
IC, see measurement point 3 below		74,0	78,0	72,2	–	–	105
Enclosure, bottom		62,8	64,9	61,1	–	–	70
Enclosure, top		64,0	65,3	61,1	–	–	70

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class
Not used.							

Supplementary information:
Temperatures have been measured at T_{amb} = +55 °C.
[1)] The equipment was in idle mode of operation.

Temperature measurement points (1-3):



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Clause	Requirement + Test	Result - Remark	Verdict

4.5.5	TABLE: Ball pressure test of thermoplastic parts		N/A
	Allowed impression diameter (mm) .....:	≤ 2 mm	—

Part	Test temperature (°C)	Impression diameter (mm)

Supplementary information:

No thermoplastic parts carrying hazardous voltages.

4.7	TABLE: Resistance to fire				P
Part	Manufacturer of material	Type of material	Thickness (mm)	Flammability class	Evidence
PCB	Several	Several	1,7	V-0	UL certified
Enclosure (optional)	Several	Metal	Various, min. 1,5mm	- [1)]	- [1)]

Supplementary information:

[1)] Metals are considered to comply without test.

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Clause	Requirement + Test	Result - Remark	Verdict

5.1.6	TABLE: Touch current measurements (single phase equipment)								N/A
Supply voltage (V) ..... :									—
Supply frequency (Hz) ..... :									—
From	Fault	L – N	L – L	L – L	L – N	L – N	L – L	L – L	Measurement limit
		TN-S, TN-C, TN-CS, TT	TN-C, TT	TN, TT	IT	IT	IT	IT	
		Not corner earthed	Middle point earthed	Not corner earthed	Not corner earthed	Corner earthed	Not corner earthed	Corner earthed	
		Figure 6	Figure 7	Figure 8	Figure 9	Figure 9	Figure 10	Figure 10	
		(mA)	(mA)	(mA)	(mA)	(mA)	(mA)	(mA)	(mA)
Equipment main protective earthing terminal	Earth								3,5 / 0,75 / 5 % of rated current
Accessible parts and circuits not connected to protective earth	None								0,25
	Earth								
	Neutral			-			-	-	
	Line	-			-	-			
	Line to earth	-	-	-		-		-	
	Compo-nent								
Supplementary information: Measurements have been carried out according to figures of IEC 60990.									

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.1.6	TABLE: Touch current measurements (three phase equipment)						N/A
Supply voltage (V) ..... :							—
Supply frequency (Hz) ..... :							—
From	Fault	TN-S, TN-C, TN-CS, TT	IT	IT	TN, TT	TN, TT	Measurement limit
		Not corner earthed	Star point earthed	Corner earthed	Corner earthed	centre earthed	
		Figure 11	Figure 12	Figure 12	Figure 13	Figure 14	
		(mA)	(mA)	(mA)	(mA)	(mA)	(mA)
Equipment main protective earthing terminal	Earth						3,5 / 0,75 / 5 % of rated current
Accessible parts and circuits not connected to protective earth	None						0,25
	Earth						
	Neutral				-	-	
	Line						
	Line to earth	-		-	-		
	Compo-nent						

Supplementary information:

Measurements have been carried out according to figures of IEC 60990.

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests			N/A
Test voltage applied between:		Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No
Functional insulation:				
N/A				
Basic/supplementary insulation:				
N/A				
Reinforced insulation:				
N/A				
Supplementary information:				

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.3	TABLE: Fault condition tests		P
	Ambient temperature (°C) .....:	22 – 23	—
	Power source for EUT: Manufacturer, model/type, output rating .....:	-	—

Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
SATEL-TA12:						
R175 / R206 / IC16 pins 4 – 5/6	Short-circuit	30,0	1 min	F1…F4	0.3	Output voltage from main DC/DC switching circuit 4.0V_{DC} to 4.8V_{PEAK} / 3.8V_{DC}. Output voltage from main DC/DC switching circuit restores to normal (4.0V_{DC}) after removing the fault. No hazard.
C100 / C221 / C222	Short-circuit	30,0	30 min	F1…F4	0.04	Equipment stops operating immediately after introducing the fault. Equipment starts to operate normally after removing the fault. No hazard.
Q1 pins 5/6 – 7/8	Short-circuit	30,0	< 5s	F1…F4	> fuse rating	F3 opens immediately and the EUT is damaged. No hazard.
Q1 pins 5/6 – 7/8	Short-circuit	9,0	1 min	F1…F4	2.0	Q1 breaks and glows for a few seconds. Glowing causes no ignition of adjacent components. No hazard.

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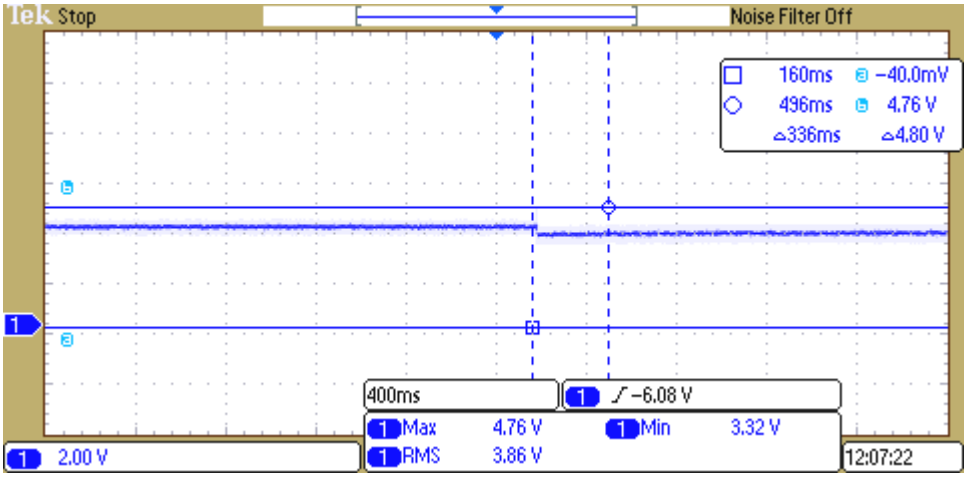
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

R175 / R206 / IC16 pins 4 – 5/6 short-circuit; graph of voltage measurement:



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

EN 60950-1:2006 – CENELEC 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 Annex ZC (informative) A-deviations		P
General	Delete all the “country” notes in the reference document according to the following list: 1.4.8 Note 2; 1.5.1 Note 2 & 3 1.5.7.1 Note; 1.5.8 Note 2 1.5.9.4 Note; 1.7.2.1 Note 4, 5 & 6 2.2.3 Note; 2.2.4 Note 2.3.2 Note; 2.3.2.1 Note 2 2.3.4 Note 2; 2.6.3.3 Note 2 & 3 2.7.1 Note; 2.10.3.2 Note 2 2.10.5.13 Note 3; 3.2.1.1 Note 3.2.4 Note 3; 2.5.1 Note 2 4.3.6 Note 1 & 2; 4.7 Note 4 4.7.2.2 Note; 4.7.3.1 Note 2 5.1.7.1 Note 3 & 4; 5.3.7 Note 1 6 Note 2 & 5; 6.1.2.1 Note 2 6.1.2.2 Note; 6.2.2 Note 6.2.2.1 Note 2; 6.2.2.2 Note 7.1 Note 3; 7.2 Note 7.3 Note 1 & 2; G.2.1 Note 2 Annex H Note 2		P

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for “one package equipment”, and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.		N/A
1.5.1	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC		P
1.7.2.1	Add the following NOTE: NOTE Z1 In addition, the instructions shall include, as far as applicable, a warning that excessive sound pressure from earphones and headphones can cause hearing loss		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.7.1	Replace the subclause as follows: Basic requirements To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c): a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment; b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation; c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions. If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.		N/A
2.7.2	This subclause has been declared 'void'.		-
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.		N/A
3.2.5.1	Replace "60245 IEC 53" by "H05 RR-F"; "60227 IEC 52" by "H03 VV-F or H03 VVH2-F"; "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2". In Table 3B, replace the first four lines by the following: Up to and including 6 — 0,75 [a] Over 6 up to and including 10 — (0,75) [b] 1,0 Over 10 up to and including 16 — (1,0) [c] 1,5 In the conditions applicable to Table 3B delete the words "in some countries" in condition [a]. In NOTE 1, applicable to Table 3B, delete the second sentence.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.3.4	In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: Over 10 up to and including 16 | 1,5 to 2,5 | 1,5 to 4 Delete the fifth line: conductor sizes for 13 to 16 A.		N/A
4.3.13.6	Add the following NOTE: NOTE Z1 Attention is drawn to 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz. Standards taking into account this Recommendation which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.		N/A
Annex H	Replace the last paragraph of this annex by: At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level. Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete NOTE 2.		N/A
Biblio-graphy	Additional EN standards.		—
ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS		—
ZB	SPECIAL NATIONAL CONDITIONS		N/A
1.2.4.1	In Denmark, certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.		N/A
1.5.7.1	In Finland, Norway and Sweden, resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.2.		N/A
1.5.8	In Norway, due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N/A
1.5.9.4	In Finland, Norway and Sweden, the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.1	In Finland, Norway and Sweden, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan" In Norway: “Apparatet mN/A tilkoples jordet stikkontakt” In Sweden: “Apparaten skall anslutas till jordat uttag”		N/A
1.7.5	In Denmark, socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a.		N/A
2.2.4	In Norway, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N/A
2.3.2	In Finland, Norway and Sweden there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.		N/A
2.3.4	In Norway, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.		N/A
2.6.3.3	In the United Kingdom, the current rating of the circuit shall be taken as 13 A, not 16 A.		N/A
2.7.1	In the United Kingdom, to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.		N/A
2.10.5.13	In Finland, Norway and Sweden, there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.1	In Switzerland, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets: SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: SEV 5932-2.1998 Plug Type 25 3L+N+PE 230/400 V, 16 A SEV 5933-2.1998 Plug Type 21 L+N 250 V, 16 A SEV 5934-2.1998 Plug Type 23 L+N+PE 250 V, 16 A		N/A
3.2.1.1	In Denmark, supply cords of single-phase equipment having a rated current not exceeding13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a. If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.1	In Spain, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994. Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993. CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994. If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.		N/A
3.2.1.1	In the United Kingdom, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations. NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N/A
3.2.1.1	In Ireland, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.		N/A
3.2.4	In Switzerland, for requirements see 3.2.1.1 of this annex.		N/A
3.2.5.1	In the United Kingdom, a power supply cord with conductor of 1,25 mm2 is allowed for equipment with a rated current over 10 A and up to and including 13 A.		N/A
3.3.4	In the United Kingdom, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is: • 1,25 mm^2 to 1,5 mm^2 nominal cross-sectional area.		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.3.6	In the United Kingdom, the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 ℃. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N/A
4.3.6	In Ireland, DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.		N/A
5.1.7.1	In Finland, Norway and Sweden TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: • STATIONARY PLUGGABLE EQUIPMENT TYPE A that ○ is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and ○ has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and ○ is provided with instructions for the installation of that conductor by a SERVICE PERSON; • STATIONARY PLUGGABLE EQUIPMENT TYPE B; • STATIONARY PERMANENTLY CONNECTED EQUIPMENT.		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.1.2.1	In Finland, Norway and Sweden, add the following text between the first and second paragraph of the compliance clause: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition - passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and - is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2. A capacitor classified Y3 according to EN 132400:1994, may bridge this insulation under the following conditions: - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1; - the additional testing shall be performed on all the test specimens as described in EN 132400; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400, in the sequence of tests as described in EN 132400.		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.1.2.2	In Finland, Norway and Sweden, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.		N/A
7.2	In Finland, Norway and Sweden, for requirements see 6.1.2.1 and 6.1.2.2 of this annex. The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.		N/A
7.3	In Norway and Sweden, there are many buildings where the screen of the coaxial cable is normally not connected to the earth in the building installation.		N/A
7.3	In Norway, for installation conditions see EN 60728-11:2005.		N/A
ZC	A-DEVIATIONS (informative)		N/A
1.5.1	Sweden (Ordinance 1990:944) Add the following: NOTE In Sweden, switches containing mercury are not permitted.		N/A
1.5.1	Switzerland (Ordinance on environmentally hazardous substances SR 814.081, Annex 1.7, Mercury - Annex 1.7 of SR 814.81 applies for mercury.) Add the following: NOTE In Switzerland, switches containing mercury such as thermostats, relays and level controllers are not allowed.		N/A

IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2.1	Denmark (Heavy Current Regulations) Supply cords of CLASS I EQUIPMENT, which is delivered without a plug, must be provided with a visible tag with the following text: Vigtigt! Lederen med grøn/gul isolation mN/A kun tilsluttes en klemme mærket  eller  If essential for the safety of the equipment, the tag must in addition be provided with a diagram, which shows the connection of the other conductors, or be provided with the following text: "For tilslutning af de øvrige ledere, se medfølgende installationsvejledning."		N/A
1.7.2.1	Germany (Gesetz über technische Arbeitsmittel und Verbraucherprodukte (Geräte- und Produktsicherheitsgesetz – GPSG) [Law on technical labour equipment and consumer products], of 6th January 2004, Section 2, Article 4, Clause (4), Item 2). If for the assurance of safety and health certain rules during use, amending or maintenance of a technical labour equipment or readymade consumer product are to be followed, a manual in German language has to be delivered when placing the product on the market. Of this requirement, rules for use even only by SERVICE PERSONS are not exempted.	To be checked before marketing the product Germany.	-
1.7.5	Denmark (Heavy Current Regulations) With the exception of CLASS II EQUIPMENT provided with a socket outlet in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-4a, CLASS II EQUIPMENT shall not be fitted with socket-outlets for providing power to other equipment.		N/A
1.7.13	Switzerland (Ordinance on chemical hazardous risk reduction SR 814.81, Annex 2.15 Batteries) Annex 2.15 of SR 814.81 applies for batteries.		N/A
5.1.7.1	Denmark (Heavy Current Regulations, Chapter 707, clause 707.4) TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B.		N/A

Nemko

Photographic documentation

Order No. 127761D

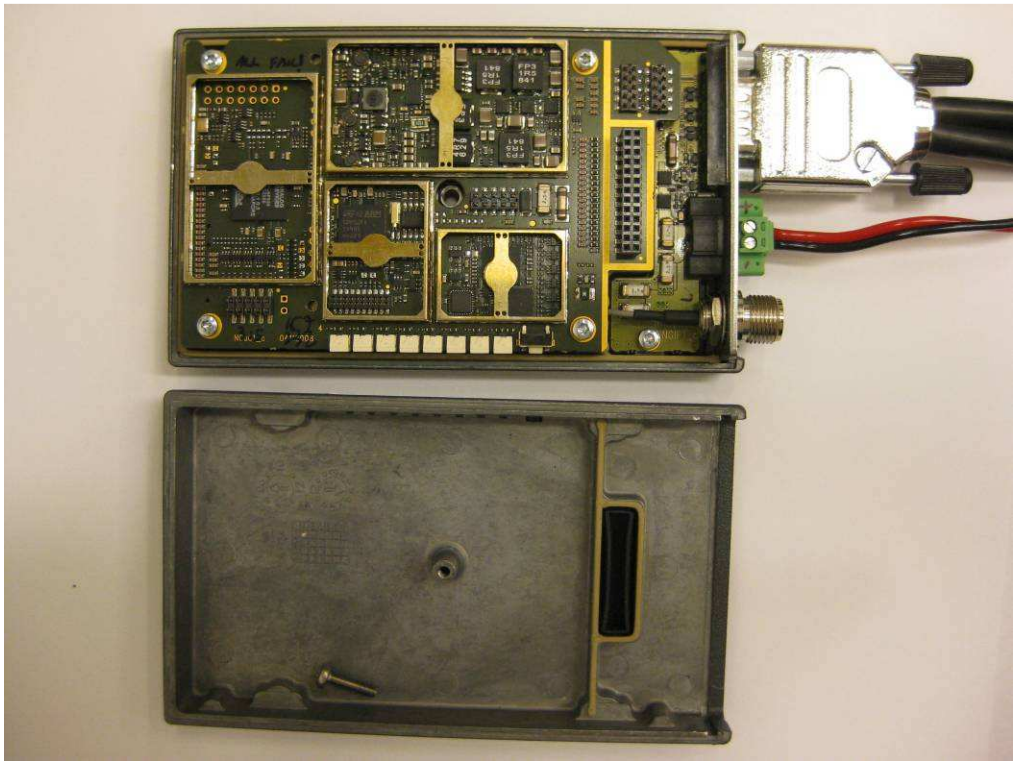
Satel TA12, marking label of the EUT is missing from the test sample

Nemko

Photographic documentation

Order No. 127761D

TA12, side view and inside view.

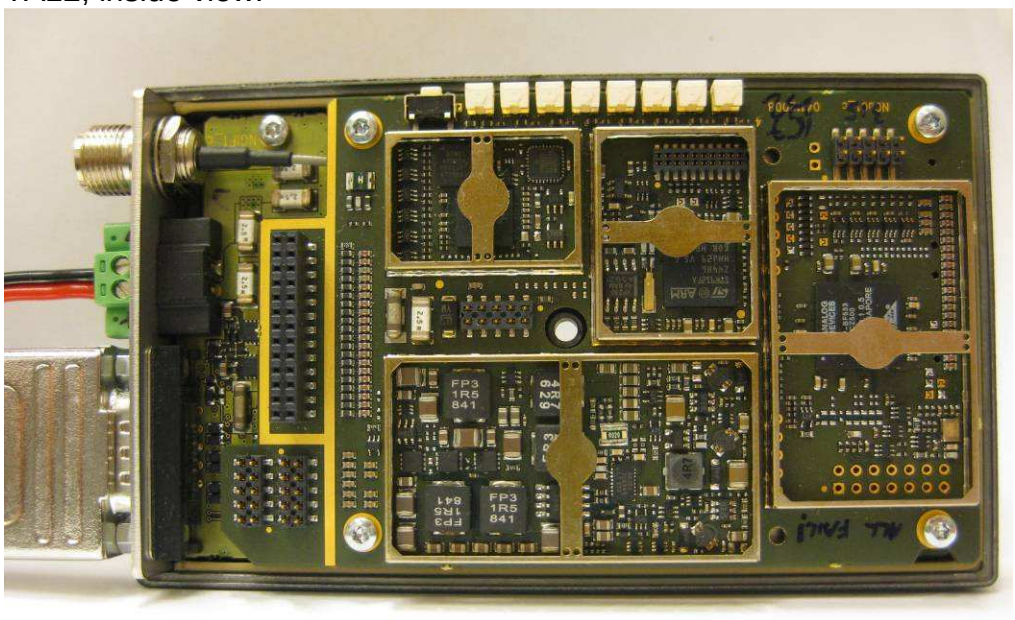


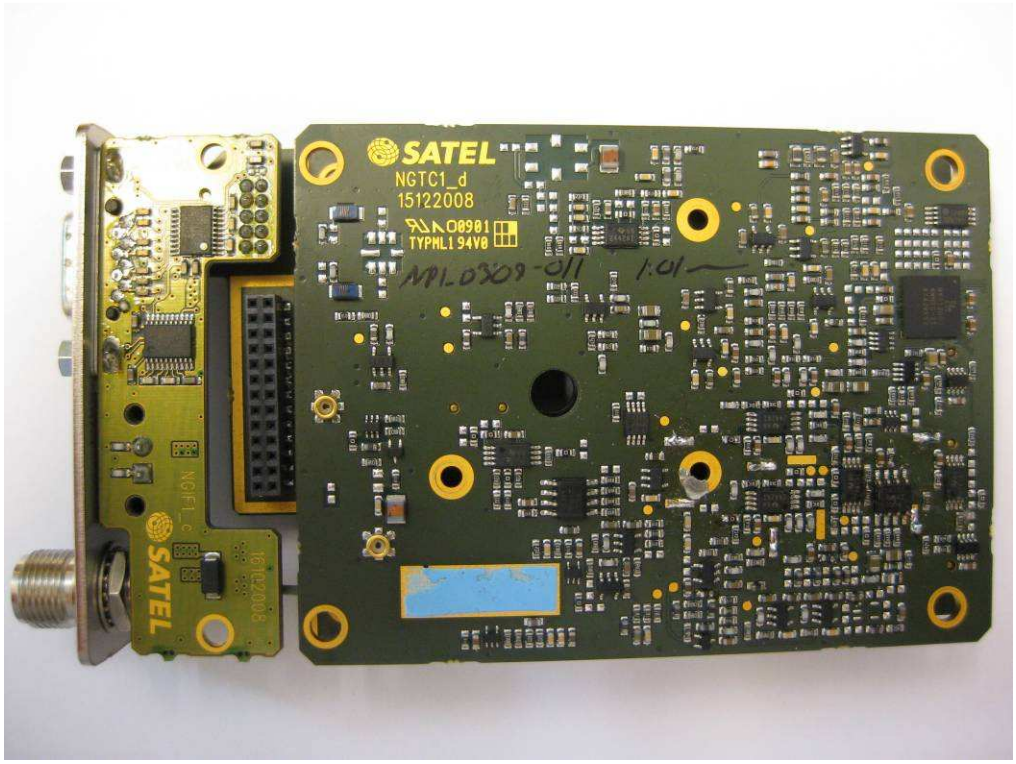
Nemko

Photographic documentation

Order No. 127761D

TA12, inside view.





Nemko

Photographic documentation

Order No. 127761D

TA12, inside view.