



<b>TEST REPORT</b> <b>IEC 62368-1</b> <b>Audio/video, information and communication technology equipment</b> <b>Part 1: Safety requirements</b>	
<b>Report reference No.</b> ..... : 17-EL-0434.S01 <b>Date of issue</b> ..... : 2018-12-12 <b>Total number of pages</b> ..... : 76 <b>CB Testing Laboratory</b> ..... : Eurofins Electrosuisse Product Testing AG Luppenstrasse 3, 8320 Fehraltorf <b>Address</b> ..... : SWITZERLAND	
<b>Applicant's name</b> ..... : NetModule AG <b>Address</b> ..... : Maulbeerstrasse 10, 3011 Bern SWITZERLAND	
<b>Test specification</b> ..... : <b>Standard</b> ..... : IEC 62368-1:2014 (Second Edition) <b>Test procedure</b> ..... : Type testing for CE <b>Non-standard test method</b> ..... : N/A	
<b>Test Report Form No.</b> ..... : IEC62368_1B <b>Test Report Form(s) Originator</b> ..... : UL(US) <b>Master TRF</b> ..... : 2014-03	
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<b>Test Item description</b> .....	Wireless Router
<b>Trade Mark</b> .....	NetModule
<b>Manufacturer</b> .....	NetModule AG Maulbeerstrasse 10, 3011 Bern SWITZERLAND
<b>Model/Type reference</b> .....	NB1800, NB1810
<b>Ratings</b> .....	12 - 48 V~, 1.7 A, 20 W (w/o option Ep: w/o PoE) 48 V~, 1.8 A, 87 W~ (with option Ep: with PoE)

<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	Eurofins Electrosuisse Product Testing AG
Testing location/ address .....		Luppenstrasse 3, 8320 Fehraltorf SWITZERLAND
<input type="checkbox"/>	<b>Associated CB Testing Laboratory:</b>	
Testing location/ address .....		
Tested by (name + signature) .....		Robert Kaufmann Project Engineer
Approved by (name + signature) .....		Jürg Hohl Project Engineer
<input type="checkbox"/>	Testing procedure: TMP/CTF Stage 1	
Testing location/ address .....		
Tested by (name + signature) .....		
Approved by (name + signature) .....		
<input type="checkbox"/>	Testing procedure: WMT/CTF Stage 2	
Testing location/ address .....		
Tested by (name + signature) .....		
Witnessed by (name + signature) .....		
Approved by (name + signature) .....		
<input type="checkbox"/>	Testing procedure: SMT/CTF Stage 3 or 4	
Testing location/ address .....		
Tested by (name + signature) .....		
Approved by (name + signature) .....		
Supervised by (name + signature) .....		

**List of Attachments (including a total number of pages in each attachment):**

- Appendix List of Test Equipment: 1 page
- ATTACHMENT TO TEST REPORT IEC 62368-1, EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES: 9 pages
- Appendix Photo Documentation: 9 pages

**Summary of testing:**

The equipment complies with this standard.

**Tests performed (name of test and test clause):****Complete test performed**

4.1.2.....:List of critical components  
 5.2.....: Classification of electrical energy sources  
 5.4.1.4.....: Temperature measurements  
 5.4.2/.3.....: Minimum Clearances/Creepage distance  
 5.4.9.....:Electric strength tests  
 6.2.2.....:Electrical power sources (PS) measurements for classification  
 6.2.3.....:Determination of Potential Ignition Sources  
 B.2.5.....: Input test  
 B.3.....:Abnormal operating condition tests  
 B.4.....:Fault condition tests  
 T.2/.3/.4/.5...:Steady force test  
 T.6/.9.....:Impact tests

(SAS accreditation no. STS 0001)

**Testing location:**

**Eurofins Electrosuisse Product Testing AG**  
**Albisriederstrasse 199, 8047 Zürich**  
**SWITZERLAND**

**Summary of compliance with National Differences:**

List of countries addressed: CENELEC

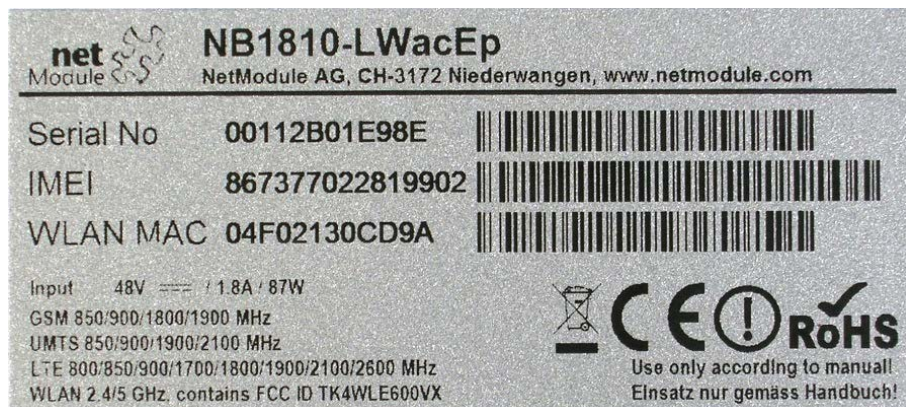
☒ The product fulfils the requirements of EN 62368-1:2014+A11:2017

**Copy of marking plate:**

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Type label NB1800 without option Ep (without PoE)



Type label NB1810 with option Ep (with PoE)

Note: Depending on the implemented communication modules, additional letters and numbers may be added to "NB1810" (see also pages 8 & 9).

TEST ITEM PARTICULARS:	
Classification of use by .....	<input checked="" type="checkbox"/> Ordinary person <input type="checkbox"/> Instructed person <input type="checkbox"/> Skilled person <input type="checkbox"/> Children likely to be present
Supply Connection .....	<input type="checkbox"/> AC Mains <input checked="" type="checkbox"/> DC Mains <input type="checkbox"/> External Circuit - not Mains connected - <input checked="" type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input type="checkbox"/> ES3
Supply % Tolerance .....	<input checked="" type="checkbox"/> +10 %/-10 % (NB1810) <input type="checkbox"/> +20 %/-15 % <input checked="" type="checkbox"/> +10 %/-15 % (NB1810) <input type="checkbox"/> None
Supply Connection – Type .....	<input type="checkbox"/> pluggable equipment type A - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> direct plug-in <input type="checkbox"/> mating connector <input type="checkbox"/> pluggable equipment type B - <input type="checkbox"/> non-detachable supply cord <input type="checkbox"/> appliance coupler <input type="checkbox"/> permanent connection <input checked="" type="checkbox"/> mating connector <input type="checkbox"/> other: _____
Considered current rating of protective device as part of building or equipment installation.....	5 A; Installation location: <input type="checkbox"/> building; <input checked="" type="checkbox"/> equipment
Equipment mobility .....	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in <input type="checkbox"/> rack-mounting <input type="checkbox"/> wall-mounted
Over voltage category (OVC) .....	<input checked="" type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other: _____
Class of equipment .....	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III
Access location .....	<input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> N/A
Pollution degree (PD) .....	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
Manufacturer's specified maximum operating ambient	70 °C
IP protection class .....	<input type="checkbox"/> IPX0 <input checked="" type="checkbox"/> IP40 (with SIM & USB covers mounted)
Power Systems .....	<input type="checkbox"/> TN <input type="checkbox"/> TT <input type="checkbox"/> IT - ____ V <sub>L-L</sub>
Altitude during operation (m) .....	<input type="checkbox"/> 2000 m or less <input checked="" type="checkbox"/> 4000 m
Altitude of test laboratory (m) .....	<input checked="" type="checkbox"/> 2000 m or less <input type="checkbox"/> ____ m
Mass of equipment (kg) .....	<input checked="" type="checkbox"/> 1.07 kg (NB1810), 0.68 kg (NB1800)
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 .....	2018-04-13
Date (s) of performance of tests .....	2018-04-13 to 2018-12-12

**GENERAL REMARKS:**

"(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 ☐ comma / ☒ point is used as the decimal separator.

**Manufacturer's Declaration per sub-clause 4.2.5 of IEC60060-2:**

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....

☐ **Yes**  
☒ **Not applicable**

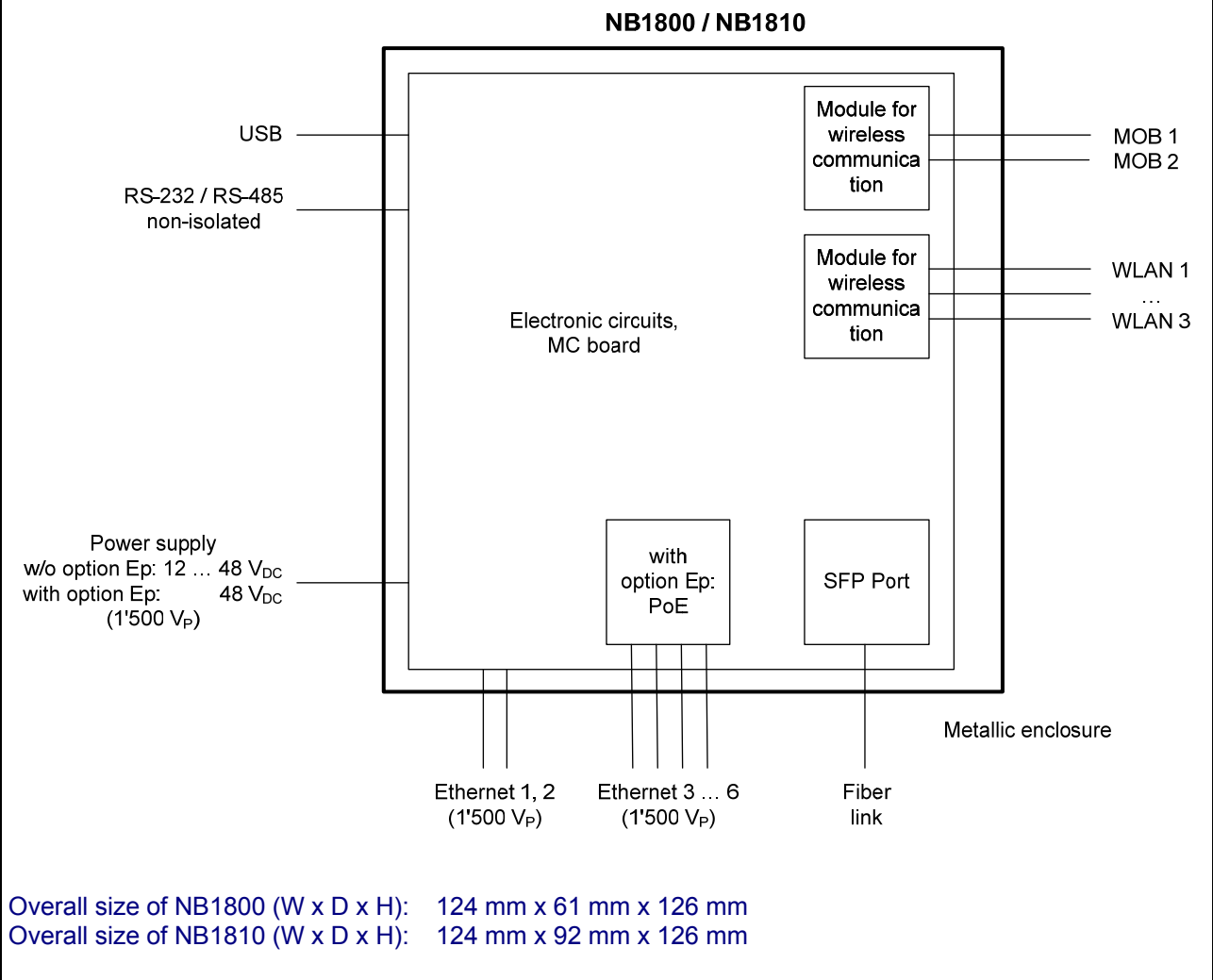
**When differences exist; they shall be identified in the General product information section.**

**Name and address of factory (ies) .....**

NetModule AG  
 Maulbeerstrasse 10  
 3011 Bern  
 SWITZERLAND

**GENERAL PRODUCT INFORMATION:****Product Description –**

The EUT is a versatile router for a multiplicity of communication interfaces (wired and radio interfaces).



### Model Differences –

Mechanically there are two housing types available. One wide with order code NB1810-... and one small with order code NB1800-...

Basically, the difference between NB1810 and NB1800 is, that NB1810 can host a more complex extension board (e.g. '4Ep': 4x Gigabit Ethernet Switch with PoE, ETH 3...ETH 6 in below picture). Both NB1810 and NB1800 can host two simple 'low end' extension boards in slots 'EXT 1' and 'EXT 2' (e.g. digital IOs, various serial interface etc).

NB1810-...



NB1800-...



Note: Depending on the implemented radio modules, additional letters and numbers may be added to "NB1810" or "NB1800".

Tested Equipment	Covered Variants	Explanation <sup>1)</sup>
NB1810-LWac4Ep (fully tested) NB1800-LWac (partly tested)	NB1810-H <sub>1</sub> ...H <sub>n</sub> -S <sub>1</sub> ...S <sub>n</sub> NB1800-H <sub>1</sub> ...H <sub>n</sub> -S <sub>1</sub> ...S <sub>n</sub>	<p>All covered NB1800 Series variants contain the same Mainboard. They can host up to three communication and other interface extension boards. These extension boards can include a GNSS module. There can be up to 7 antenna connectors.</p> <p>The wireless communication modules applied have been CE and FCC certified in an independent way of the tested equipment.</p> <p>Mechanically there are two housing types available. One wide, with order code NB1810-... and one small with order code NB1800-...</p> <p>Basically, the difference between NB1810 and NB1800 is, that NB1810 can host a more complex extension board (e.g. '4Ep': 4x Gigabit Ethernet Switch with PoE, ETH 3...ETH 6 in below picture). Both NB1810 and NB1800 can host two simple 'low end' extension boards in slots 'EXT 1' and 'EXT 2' (e.g. digital IOs, various serial interface etc).</p>

Tested Equipment	Covered Variants	Explanation <sup>1)</sup>
NB1810-LWac4Ep (fully tested) NB1800-LWac (partly tested)	NB1810-H <sub>1</sub> ...H <sub>n</sub> -S <sub>1</sub> ...S <sub>n</sub>  NB1800-H <sub>1</sub> ...H <sub>n</sub> -S <sub>1</sub> ...S <sub>n</sub>	<p>'H<sub>1</sub>...H<sub>n</sub>' is a sequence of the following letters that identify the communication modules included:</p> <p>Sb: RS-232  R: none, router only  Ed: 2G = GPRS/EDGE  U: 3G+ = 2G+UMTS/HSPA/HSPA+  Ub: UMTS / CDMA US  L: 4G = 3G+ + LTE  La: LTE 450MHz  Lb: LTE US  Lc: LTE Advanced Asia  Ld: LTE Advanced Europe  Le: LTE Advanced South America  Lf: LTE South America  Ca: CDMA450  Gr: GSM-R  Ga: GNSS Advanced  Gd: GNSS Untethered Dead Reckoning  W: WLAN a/b/g/n  Wac: WiFi a/b/g/n/ac  Wt: Bluetooth + BLE  Wz: Zigbee  Eg: Gigabit Ethernet  Ep: Gigabit Ethernet with PoE  D: Digital Inputs &amp; Outputs  A: Audio in/out  Ap: Push to Talk  C: CAN-bus <sup>2)</sup>  Sa: RS-485 (on the same module as CAN) <sup>2)</sup>  I: IBIS-bus <sup>2)</sup>  Sb: RS-232 (on the same module as IBIS) <sup>2)</sup>  Da: Data Storage 32 GB  Db: Data Storage 64 GB  Dc: Data Storage 128 GB  Dd: Data Storage 256 GB  De: Data Storage 512 GB  Df: Data Storage 1 TB  ... (more to follow)</p> <p>'S<sub>1</sub>...S<sub>n</sub>' indicate software options activated:</p> <p>G GPS  S VPN Server  V VoIP Gateway  Y Plain Linux  Vi Virtualisation, LXC</p> <p>'O' indicates OEM options, typ. customer brand labeling e.g.:</p> <p>TAG Tagfinder  OEMaCustomer A  OEMbCustomer B</p>

Tested Equipment	Covered Variants	Explanation <sup>1)</sup>
NB1810-LWac4Ep (fully tested) NB1800-LWac (partly tested)	NB1810-H <sub>1</sub> ...H <sub>n</sub> -S <sub>1</sub> ...S <sub>n</sub>  NB1800-H <sub>1</sub> ...H <sub>n</sub> -S <sub>1</sub> ...S <sub>n</sub>	<p>The following NB1800 Series variants are currently available or planned. In below order codes, 'NB1810' can be replaced with 'NB1800' if not other described.</p> <p><u>Radio Interface Options:</u></p> <p>NB1810-L...      LTE for Europe/Asia  <span style="float: right;">1x mPCIe card</span></p> <p>NB1810-2L...      2x LTE      2x mPCIe card</p> <p>NB1810-LWac...      LTE + WLAN-ac  <span style="float: right;">2x mPCIe card</span></p> <p>NB1810-Wac...      WLAN-ac      1x mPCIe card</p> <p>NB1810-2Wac...      2x WLAN      2x mPCIe card</p> <p>Examples to assembled 2nd mPCIe card slot if only one mPCIe slot is used by a radio module:  NB1810-LGa      LTE + GNSS Adv.  NB1810-WacGa      WLAN-ac +GNSS Adv.  2<sup>nd</sup> mPCIe slot can be assembled with any other mPCIe card e.g. storage 'Dx' or GNSS Udr 'Gd'.</p> <p>'L' (LTE modem for Europe) above can be replaced with below listed modems:  NB1810-...Lb...      LTE modem for North America  NB1810-...Lf...      LTE modem for South America  NB1810-...Lc...      LTE Advanced modem for Asia  NB1810-...Ld...      LTE Advanced modem for Europe  NB1810-...Le...      LTE Advanced modem for South America  NB1810-...La...      LTE450MHz  NB1810-...Gr...      GSM-R  NB1810-...Ca...      CDMA</p> <p>'Wac' (WLAN 802.11ac) above can be replaced with below listed Standards:  NB1810-...W      WLAN a/b/g/n</p> <p>§</p> <p><u>Storage Options:</u>  Any order code combination  <span style="float: right;">mPCIe card or SSD</span></p> <p>NB1810-...Da...      +32 GB Storage  NB1810-...Db...      +64 GB Storage</p> <p><u>GNSS Options:</u>  Any order code combination  <span style="float: right;">+GNSS (e.g. mPCIe card)</span></p> <p>NB1810-...Ga...      +GNSS-Adv.  NB1810-...Gd...      +GNSS-Udr</p>

Tested Equipment	Covered Variants	Explanation <sup>1)</sup>
NB1810-LWac4Ep (fully tested) NB1800-LWac (partly tested)	NB1810-H <sub>1</sub> ...H <sub>n</sub> -S <sub>1</sub> ...S <sub>n</sub>  NB1800-H <sub>1</sub> ...H <sub>n</sub> -S <sub>1</sub> ...S <sub>n</sub>	<p><u>Other Interface Options:</u> Any order code combination</p> <p>Slots 'EXT 1' and 'EXT 2'</p> <p>NB1810-...C... +CAN <sup>2)</sup>  NB1810-...2C... +2xCAN <sup>2)</sup>  NB1810-...D... +Digital Inputs &amp; Outputs <sup>2)</sup>  NB1810-...I... +IBIS bus <sup>2)</sup>  NB1810-...S... +Serial, non-isolated  NB1810-...Sa... +Serial RS-485, isolated <sup>2)</sup>  NB1810-...Sb... +Serial RS-232, isolated <sup>2)</sup>  NB1810-...Sc... +RS232/485 combo +IOs  NB1810-...Ap... +PTT  ...(more to follow) e.g. 4-wire Serial, multiple or combo interfaces</p> <p><u>Ethernet Switch Options (Just 1810):</u> Extension Board with PCIe conn. to Mainboard</p> <p><b>NB1810-4Ep 4x GbE Switch with PoE</b>  NB1810-Wac4Ep +WLAN-ac  NB1810-2Wac4Ep +2x WLAN  NB1810-L4Ep +LTE  NB1810-2L4Ep +2x LTE  <b>NB1810-LWac4Ep LTE +WLAN-ac + 4x GbE Switch with PoE</b>  NB1810-LDa4Ep +LTE +32GB Storage  NB1810-LDb4Ep +LTE +64GB Storage  NB1810-LGa4Ep +LTE +GNSS-Adv.  NB1810-LGd4Ep +LTE +GNSS-Udr.</p> <p>'Ep' above can be replaced with 'E' (Ethernet without PoE), e.g.:  NB1810-...4E... 4xGbE Switch</p> <p><u>Base-Devices (without radio interfaces)</u>  NB1810-R Wireline  NB1810-Ga +GNSS-Adv. (uses one of two mPCIe slots)  NB1810-Gd +GNSS-Udr. (uses one of two mPCIe slots)</p> <p><u>SW Options:</u>  Add suffix for any SW option, e.g. -Y for plain Linux, -Vi for LX Container  Examples:  NB1810-LWac-Y  NB1810-LWac-Vi  NB1810-LWac-Y  NB1810-LWac-Vi</p> <p><u>OEM Options:</u>  Add suffix -TAG, -OEM1, -OEM2 for OEM branding options (logo print), e.g. NB1810-LWac-TAG</p>

<sup>1)</sup> according to information of the customer and not verified by Eurofins Electrosuisse Product Testing AG.  
<sup>2)</sup> following options with isolated ports are not tested (not part of this evaluation):

D: Digital Inputs & Outputs  
C: CAN-bus  
Sa: RS-485, isolated  
Sb: RS-232, isolated  
I: IBIS-bus

**Additional application considerations – (Considerations used to test a component or sub-assembly)**

–

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.)	
<b>Electrically-caused injury (Clause 5):</b> (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input <span style="float: right;">ES1</span>	
<b>Source of electrical energy</b>	<b>Corresponding classification (ES)</b>
All circuits	ES1
---	---
<b>Electrically-caused fire (Clause 6):</b> (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts): <span style="float: right;">PS2</span>	
<b>Source of power or PIS</b>	<b>Corresponding classification (PS)</b>
Power input & PoE powered circuits	PS3
PoE	PS2
USB interface	PS1
<b>Injury caused by hazardous substances (Clause 7)</b> (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component <span style="float: right;">Glycol</span>	
<b>Source of hazardous substances</b>	<b>Corresponding chemical</b>
N/A	N/A
---	---
<b>Mechanically-caused injury (Clause 8)</b> (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit <span style="float: right;">MS2</span>	
<b>Source of kinetic/mechanical energy</b>	<b>Corresponding classification (MS)</b>
Sharp edges & corners	MS1
Fixed device	MS1
<b>Thermal burn injury (Clause 9)</b> (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.) Example: Hand-held scanner – thermoplastic enclosure <span style="float: right;">TS1</span>	
<b>Source of thermal energy</b>	<b>Corresponding classification (TS)</b>
Accessible surfaces	TS1
---	---
<b>Radiation (Clause 10)</b> (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product <span style="float: right;">RS1</span>	
<b>Type of radiation</b>	<b>Corresponding classification (RS)</b>
LED indicators	RS1
---	---

**ENERGY SOURCE DIAGRAM**

Indicate which energy sources are included in the energy source diagram. Insert diagram below

☐ **ES**    ☐ **PS**    ☐ **MS**    ☐ **TS**    ☐ **RS**

OVERVIEW OF EMPLOYED SAFEGUARDS				
Clause	Possible Hazard			
5.1	Electrically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (ES3: Primary Filter circuit)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	ES1: All circuits	N/A	N/A	N/A
---	---	---	---	---
6.1	Electrically-caused fire			
Material part (e.g. mouse enclosure)	Energy Source (PS2: 100 Watt circuit)	Safeguards		
		Basic	Supplementary	Reinforced
All combustible materials within equipment fire enclosure	PS3: Power input & PoE powered circuits	No excessive temp.	Suitable material	N/A
All combustible materials within equipment fire enclosure	PS2: PoE	No excessive temp.	Suitable material	N/A
USB connector	PS1: USB interface	N/A	N/A	N/A
7.1	Injury caused by hazardous substances			
Body Part (e.g., skilled)	Energy Source (hazardous material)	Safeguards		
		Basic	Supplementary	Reinforced
---	---	---	---	---
---	---	---	---	---
8.1	Mechanically-caused injury			
Body Part (e.g. Ordinary)	Energy Source (MS3:High Pressure Lamp)	Safeguards		
		Basic	Supplementary	Reinforced (Enclosure)
Ordinary	MS1: Sharp edges & corners	N/A	N/A	N/A
Ordinary	MS1: Fixed device	N/A	N/A	N/A
9.1	Thermal Burn			
Body Part (e.g., Ordinary)	Energy Source (TS2)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	TS1: Accessible surfaces	N/A	N/A	N/A
---	---	---	---	---
10.1	Radiation			
Body Part (e.g., Ordinary)	Energy Source (Output from audio port)	Safeguards		
		Basic	Supplementary	Reinforced
Ordinary	RS1: LED indicators	N/A	N/A	N/A
Ordinary	RS1: WLAN module	N/A	N/A	N/A
Supplementary Information: (1) See attached energy source diagram for additional details. (2) "N" – Normal Condition; "A" – Abnormal Condition; "S" Single Fault				

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>GENERAL REQUIREMENTS</b>		P
4.1.1	Acceptance of materials, components and subassemblies		P
4.1.2	Use of components		P
4.1.3	Equipment design and construction		P
4.1.15	Markings and instructions .....	(See Annex F)	P
4.4.4	Safeguard robustness		P
4.4.4.2	Steady force tests .....	(See Annex T.4, T.5)	P
4.4.4.3	Drop tests.....	Fixed device (See Annex T.7)	N/A
4.4.4.4	Impact tests.....	(See Annex T.6)	P
4.4.4.5	Internal accessible safeguard enclosure and barrier tests .....	No such parts (See Annex T.3)	N/A
4.4.4.6	Glass Impact tests .....	(See Annex T.9, Annex U)	N/A
4.4.4.74	Thermoplastic material tests.....	(See Annex T.8)	N/A
4.4.4.8	Air comprising a safeguard .....	(See Annex T)	P
4.4.4.9	Accessibility and safeguard effectiveness		P
4.5	Explosion		N/A
4.6	Fixing of conductors		P
4.6.1	Fix conductors not to defeat a safeguard		P
4.6.2	10 N force test applied to .....	Internal wire or components	P
4.7	Equipment for direct insertion into mains socket - outlets	No mains	N/A
4.7.2	Mains plug part complies with the relevant standard..		N/A
4.7.3	Torque (Nm).....	---	N/A
4.8	Products containing coin/button cell batteries		N/A
4.8.2	Instructional safeguard		N/A
4.8.3	Battery Compartment Construction	No battery	N/A
	Means to reduce the possibility of children removing the battery .....	---	—
4.8.4	Battery Compartment Mechanical Tests .....	(See Table 4.8.4)	N/A
4.8.5	Battery Accessibility		N/A
4.9	Likelihood of fire or shock due to entry of conductive object .....	No openings apart from small SIM card slots, can't be entry (See Annex P)	P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
<b>5</b>	<b>ELECTRICALLY-CAUSED INJURY</b>		<b>P</b>
5.2.1	Electrical energy source classifications .....	ES1: All circuits (See appended table 5.2)	P
5.2.2	ES1, ES2 and ES3 limits		P
5.2.2.2	Steady-state voltage and current .....	See appended table 5.2)	P
5.2.2.3	Capacitance limits.....	(See appended table 5.2)	N/A
5.2.2.4	Single pulse limits .....	(See appended table 5.2)	N/A
5.2.2.5	Limits for repetitive pulses .....	(See appended table 5.2)	N/A
5.2.2.6	Ringing signals .....	(See Annex H)	N/A
5.2.2.7	Audio signals .....	(See Clause E.1 )	N/A
5.3	Protection against electrical energy sources		P
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons		P
5.3.2.1	Accessibility to electrical energy sources and safeguards		P
5.3.2.2	Contact requirements		P
	a) Test with test probe from Annex V.....	ES1 voltages	P
	b) Electric strength test potential (V) .....	---	N/A
	c) Air gap (mm) .....	---	N/A
5.3.2.4	Terminals for connecting stripped wire		N/A
5.4	Insulation materials and requirements		P
5.4.1.2	Properties of insulating material		P
5.4.1.3	Humidity conditioning.....	No hygroscopic material (See sub-clause 5.4.8)	N/A
5.4.1.4	Maximum operating temperature for insulating materials .....	Considered to be class 130 (B) (See appended table 5.4.1.4)	P
5.4.1.5	Pollution degree .....	2	—
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound		N/A
5.4.1.5.3	Thermal cycling		N/A
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		N/A
5.4.1.8	Determination of working voltage		P
5.4.1.9	Insulating surfaces		N/A
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		N/A
5.4.1.10.2	Vicat softening temperature .....	(See appended table 5.4.1.10.2)	N/A
5.4.1.10.3	Ball pressure .....	(See appended table 5.4.1.10.3)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.2	Clearances		P
5.4.2.2	Determining clearance using peak working voltage	(See appended table 5.4.2.2)	P
5.4.2.3	Determining clearance using required withstand voltage .....	(See appended table 5.4.2.3)	P
	a) a.c. mains transient voltage..... :	---	—
	b) d.c. mains transient voltage .....	1'500 V <sub>peak</sub>	—
	c) external circuit transient voltage..... :	1'500 V <sub>peak</sub> (Ethernet)	—
	d) transient voltage determined by measurement ... :	---	—
5.4.2.4	Determining the adequacy of a clearance using an electric strength test	(See appended table 5.4.2.4)	N/A
5.4.2.5	Multiplication factors for clearances and test voltages .....	4'000 m	P
5.4.3	Creepage distances..... :	(See appended table 5.4.3)	P
5.4.3.1	General		P
5.4.3.3	Material Group .....	IIIb	—
5.4.4	Solid insulation		P
5.4.4.2	Minimum distance through insulation .....	(See appended table 5.4.4.2)	N/A
5.4.4.3	Insulation compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Cemented joints		N/A
5.4.4.6	Thin sheet material		N/A
5.4.4.6.1	General requirements		N/A
5.4.4.6.2	Separable thin sheet material		N/A
	Number of layers (pcs) .....	---	N/A
5.4.4.6.3	Non-separable thin sheet material		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material .....	(See appended Table 5.4.9)	N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components		N/A
5.4.4.9	Solid insulation at frequencies >30 kHz..... :	(See appended Table 5.4.4.9)	N/A
5.4.5	Antenna terminal insulation	Certified WLAN & WWAN modules	N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
	Insulation resistance (MΩ)..... :		—
5.4.6	Insulation of internal wire as part of supplementary safeguard .....	(See appended table 5.4.4.2)	N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		N/A
	Relative humidity (%)..... :	---	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Temperature (°C) .....	---	---
	Duration (h) .....	---	---
5.4.9	Electric strength test .....	(See appended table 5.4.9)	P
5.4.9.1	Test procedure for a solid insulation type test		P
5.4.9.2	Test procedure for routine tests		N/A
5.4.10	Protection against transient voltages between external circuit		P
5.4.10.1	Parts and circuits separated from external circuits	(See appended table 5.4.9)	P
5.4.10.2	Test methods		P
5.4.10.2.1	General		P
5.4.10.2.2	Impulse test.....	(See appended table 5.4.9)	N/A
5.4.10.2.3	Steady-state test.....	(See appended table 5.4.9)	P
5.4.11	Insulation between external circuits and earthed circuitry.....	(See appended table 5.4.9)	N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	Rated operating voltage $U_{op}$ (V).....	---	---
	Nominal voltage $U_{peak}$ (V).....	---	---
	Max increase due to variation $U_{sp}$ .....	---	---
	Max increase due to ageing $\Delta U_{sa}$ .....	---	---
	$U_{op} = U_{peak} + \Delta U_{sp} + \Delta U_{sa}$ .....	---	---
5.5	Components as safeguards		P
5.5.1	General		P
5.5.2	Capacitors and RC units		N/A
5.5.2.1	General requirement		N/A
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector .....	(See appended table 5.5.2.2)	N/A
5.5.3	Transformers	(See Annex G.5.3)	N/A
5.5.4	Optocouplers	(See sub-clause 5.4 or Annex G.12)	P
5.5.5	Relays	(See Annex G.2)	N/A
5.5.6	Resistors	(See Annex G.10)	N/A
5.5.7	SPD's	(See Annex G.8)	N/A
5.5.7.1	Use of an SPD connected to reliable earthing		N/A
5.5.7.2	Use of an SPD between mains and protective earth		N/A
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable .....	(See Annex G.10.3)	N/A
5.6	Protective conductor		N/A
5.6.2	Requirement for protective conductors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation		N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm <sup>2</sup> ) ..... :	---	—
5.6.4	Requirement for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm <sup>2</sup> ). ..... :	---	—
	Protective current rating (A) ..... :	---	—
5.6.4.3	Current limiting and overcurrent protective devices		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Requirement		N/A
	Conductor size (mm <sup>2</sup> ), nominal thread diameter (mm)..... :	---	N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective system		N/A
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method Resistance (Ω)..... :	(See appended table 5.6.6.2)	N/A
5.6.7	Reliable earthing		N/A
5.7	Prospective touch voltage, touch current and protective conductor current		N/A
5.7.2	Measuring devices and networks		N/A
5.7.2.1	Measurement of touch current..... :	(See appended table 5.7.4)	N/A
5.7.2.2	Measurement of prospective touch voltage		N/A
5.7.3	Equipment set-up, supply connections and earth connections		N/A
	System of interconnected equipment (separate connections/single connection)..... :	---	—
	Multiple connections to mains (one connection at a time/simultaneous connections) ..... :	---	—
5.7.4	Earthed conductive accessible parts ..... :	(See appended Table 5.7.4)	N/A
5.7.5	Protective conductor current		N/A
	Supply Voltage (V)..... :	---	—
	Measured current (mA)..... :	---	—
	Instructional Safeguard..... :	(See F.4 and F.5)	N/A
5.7.6	Prospective touch voltage and touch current due to external circuits		N/A
5.7.6.1	Touch current from coaxial cables		N/A
5.7.6.2	Prospective touch voltage and touch current from external circuits		N/A
5.7.7	Summation of touch currents from external circuits		N/A
	a) Equipment with earthed external circuits Measured current (mA)..... :	---	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) Equipment whose external circuits are not referenced to earth. Measured current (mA) ..... :	---	N/A
<b>6</b>	<b>ELECTRICALLY- CAUSED FIRE</b>		<b>P</b>
6.2	Classification of power sources (PS) and potential ignition sources (PIS)		P
6.2.2	Power source circuit classifications		P
6.2.2.1	General		P
6.2.2.2	Power measurement for worst-case load fault... :	(See appended table 6.2.2)	P
6.2.2.3	Power measurement for worst-case power source fault..... :	(See appended table 6.2.2)	P
6.2.2.4	PS1 ..... :	USB interface (See appended table 6.2.2)	P
6.2.2.5	PS2 ..... :	PoE (See appended table 6.2.2)	P
6.2.2.6	PS3 ..... :	Power input & PoE powered circuits (See appended table 6.2.2)	P
6.2.3	Classification of potential ignition sources		P
6.2.3.1	Arcing PIS ..... :	All PIS within fire enclosure (See appended table 6.2.3.1)	P
6.2.3.2	Resistive PIS ..... :	All PIS within fire enclosure (See appended table 6.2.3.2)	P
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.3.1 (a)	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials..... :	(See appended table 5.4.1.5, 6.3.2, 9.0, B.2.6)	P
6.3.1 (b)	Combustible materials outside fire enclosure		N/A
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard Method		P
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		P
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		P
6.4.3.1	General		P
6.4.3.2	Supplementary Safeguards		P
	Special conditions if conductors on printed boards are opened or peeled		N/A
6.4.3.3	Single Fault Conditions..... :	(See appended table 6.4.3)	P
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		P
6.4.5	Control of fire spread in PS2 circuits		P
6.4.5.2	Supplementary safeguards ..... :	(See appended tables 4.1.2 and Annex G)	P
6.4.6	Control of fire spread in PS3 circuit		P

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Clause	Requirement + Test	Result - Remark	Verdict
6.4.7	Separation of combustible materials from a PIS		N/A
6.4.7.1	General .....	(See tables 6.2.3.1 and 6.2.3.2)	N/A
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers		P
6.4.8.1	Fire enclosure and fire barrier material properties		P
6.4.8.2.1	Requirements for a fire barrier		N/A
6.4.8.2.2	Requirements for a fire enclosure	Metal	P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		P
6.4.8.3.1	Fire enclosure and fire barrier openings		P
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top Openings in Fire Enclosure: dimensions (mm) .....	No openings	P
	Needle Flame test		N/A
6.4.8.3.4	Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) .....	No openings	P
	Flammability tests for the bottom of a fire enclosure .....	---	N/A
6.4.8.3.5	Integrity of the fire enclosure, condition met: a), b) or c).....	No door or cover that can be opened	N/A
6.4.8.4	Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating.....	---	N/A
6.5	Internal and external wiring		P
6.5.1	Requirements		P
6.5.2	Cross-sectional area (mm <sup>2</sup> ) .....	22 AWG (0.3 mm <sup>2</sup> ) (ext. wiring not part of the EUT)	—
6.5.3	Requirements for interconnection to building wiring :	(See Annex Q.)	P
6.6	Safeguards against fire due to connection to additional equipment		P
	External port limited to PS2 or complies with Clause Q.1		P
<b>7</b>	<b>INJURY CAUSED BY HAZARDOUS SUBSTANCES</b>		N/A
7.2	Reduction of exposure to hazardous substances		N/A
7.3	Ozone exposure		N/A
7.4	Use of personal safeguards (PPE)		N/A
	Personal safeguards and instructions .....	---	—
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010).....	---	—
7.6	Batteries.....	(See Annex M)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
<b>8</b>	<b>MECHANICALLY-CAUSED INJURY</b>		P
8.1	General		P
8.2	Mechanical energy source classifications	MS1: Fixed device	P
8.3	Safeguards against mechanical energy sources		N/A
8.4	Safeguards against parts with sharp edges and corners		N/A
8.4.1	Safeguards		N/A
8.5	Safeguards against moving parts	No moving parts	N/A
8.5.1	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
8.5.2	Instructional Safeguard..... :	---	—
8.5.4	Special categories of equipment comprising moving parts		N/A
8.5.4.1	Large data storage equipment		N/A
8.5.4.2	Equipment having electromechanical device for destruction of media		N/A
8.5.4.2.1	Safeguards and Safety Interlocks .....	(See Annex F.4 and Annex K)	N/A
8.5.4.2.2	Instructional safeguards against moving parts		N/A
	Instructional Safeguard..... :	---	—
8.5.4.2.3	Disconnection from the supply		N/A
8.5.4.2.4	Probe type and force (N) .....	---	N/A
8.5.5	High Pressure Lamps		N/A
8.5.5.1	Energy Source Classification		N/A
8.5.5.2	High Pressure Lamp Explosion Test..... :	(See appended table 8.5.5.2)	N/A
8.6	Stability	Fixed device	N/A
8.6.1	Product classification		N/A
	Instructional Safeguard..... :	---	—
8.6.2	Static stability		N/A
8.6.2.2	Static stability test		N/A
	Applied Force..... :	---	—
8.6.2.3	Downward Force Test		N/A
8.6.3	Relocation stability test		N/A
	Unit configuration during 10° tilt .....	---	—
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test (Applied Force) .....	---	N/A
	Position of feet or movable parts..... :	---	—
8.7	Equipment mounted to wall or ceiling		N/A
8.7.1	Mounting Means (Length of screws (mm) and mounting surface) .....	---	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.7.2	Direction and applied force..... :	---	N/A
8.8	Handles strength		N/A
8.8.1	Classification		N/A
8.8.2	Applied Force ..... :	---	N/A
8.9	Wheels or casters attachment requirements		N/A
8.9.1	Classification		N/A
8.9.2	Applied force ..... :	---	—
8.10	Carts, stands and similar carriers		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions		N/A
	Instructional Safeguard..... :	---	—
8.10.3	Cart, stand or carrier loading test and compliance		N/A
	Applied force ..... :	---	—
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Applied horizontal force (N)..... :	---	—
8.10.6	Thermoplastic temperature stability (°C) ..... :	---	N/A
8.11	Mounting means for rack mounted equipment		N/A
8.11.1	General		N/A
8.11.2	Product Classification		N/A
8.11.3	Mechanical strength test, variable <i>N</i> ..... :	---	N/A
8.11.4	Mechanical strength test 250N, including end stops	---	N/A
8.12	Telescoping or rod antennas.....	(See Annex T)	N/A
	Button/Ball diameter (mm)..... :	---	—
<b>9</b>	<b>THERMAL BURN INJURY</b>		<b>P</b>
9.2	Thermal energy source classifications	TS1: Accessible surfaces	P
9.3	Safeguard against thermal energy sources		N/A
9.4	Requirements for safeguards		N/A
9.4.1	Equipment safeguard		N/A
9.4.2	Instructional safeguard ..... :	---	N/A
<b>10</b>	<b>RADIATION</b>		<b>P</b>
10.2	Radiation energy source classification	RS1: LED indicators	P
10.2.1	General classification		P
10.3	Protection against laser radiation		N/A
	Laser radiation that exists equipment:		—
	Normal, abnormal, single-fault..... :	---	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Instructional safeguard .....	---	—
	Tool .....	---	—
10.4	Protection against visible, infrared, and UV radiation		N/A
10.4.1	General		N/A
10.4.1.a)	RS3 for Ordinary and instructed persons .....	---	N/A
10.4.1.b)	RS3 accessible to a skilled person .....	---	N/A
	Personal safeguard (PPE) instructional safeguard .....	---	—
10.4.1.c)	Equipment visible, IR, UV does not exceed RS1 :		N/A
10.4.1.d)	Normal, abnormal, single-fault conditions .....	(See appended table B.3 & B.4)	N/A
10.4.1.e)	Enclosure material employed as safeguard is opaque .....	---	N/A
10.4.1.f)	UV attenuation .....	---	N/A
10.4.1.g)	Materials resistant to degradation UV .....	---	N/A
10.4.1.h)	Enclosure containment of optical radiation .....	---	N/A
10.4.1.i)	Exempt Group under normal operating conditions :	---	N/A
10.4.2	Instructional safeguard .....	---	N/A
10.5	Protection against x-radiation		N/A
10.5.1	X- radiation energy source that exists equipment :	(See appended table B.3 & B.4)	N/A
	Normal, abnormal, single fault conditions		N/A
	Equipment safeguards .....	---	N/A
	Instructional safeguard for skilled person .....	---	N/A
10.5.3	Most unfavourable supply voltage to give maximum radiation .....	---	—
	Abnormal and single-fault condition .....	(See appended table B.3 & B.4)	N/A
	Maximum radiation (pA/kg) .....	---	N/A
10.6	Protection against acoustic energy sources		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output, dB(A) .....	---	N/A
	Output voltage, unweighted r.m.s. ....	---	N/A
10.6.4	Protection of persons		N/A
	Instructional safeguards .....	---	N/A
	Equipment safeguard prevent ordinary person to RS2 .....	---	—
	Means to actively inform user of increase sound pressure .....	---	—
	Equipment safeguard prevent ordinary person to RS2 .....	---	—

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Clause	Requirement + Test	Result - Remark	Verdict
10.6.5	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.5.1	Corded passive listening devices with analog input		N/A
	Input voltage with 94 dB(A) $L_{Aeq}$ acoustic pressure output .....	---	—
10.6.5.2	Corded listening devices with digital input		N/A
	Maximum dB(A) .....	---	—
10.6.5.3	Cordless listening device		N/A
	Maximum dB(A) .....	---	—
<b>B</b>	<b>NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS</b>		<b>P</b>
B.2	Normal Operating Conditions		P
B.2.1	General requirements .....	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers.....	(See Annex E)	N/A
B.2.3	Supply voltage and tolerances		P
B.2.5	Input test .....	(See appended table B.2.5)	P
B.3	Simulated abnormal operating conditions		P
B.3.1	General requirements .....	(See appended table B.3)	P
B.3.2	Covering of ventilation openings		N/A
B.3.3	D.C. mains polarity test		P
B.3.4	Setting of voltage selector .....	No such parts	N/A
B.3.5	Maximum load at output terminals.....	USB (X1711)	P
B.3.6	Reverse battery polarity		N/A
B.3.7	Abnormal operating conditions as specified in Clause E.2.		N/A
B.3.8	Safeguards functional during and after abnormal operating conditions		P
B.4	Simulated single fault conditions		P
B.4.2	Temperature controlling device open or short-circuited.....	(See appended table B.4)	N/A
B.4.3	Motor tests		N/A
B.4.3.1	Motor blocked or rotor locked increasing the internal ambient temperature .....	(See Clause G.5)	N/A
B.4.4	Short circuit of functional insulation		P
B.4.4.1	Short circuit of clearances for functional insulation		P
B.4.4.2	Short circuit of creepage distances for functional insulation		P
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
B.4.5	Short circuit and interruption of electrodes in tubes and semiconductors		N/A
B.4.6	Short circuit or disconnect of passive components		P
B.4.7	Continuous operation of components		P
B.4.8	Class 1 and Class 2 energy sources within limits during and after single fault conditions		P
B.4.9	Battery charging under single fault conditions..... :	(See Annex M)	N/A
<b>C</b>	<b>UV RADIATION</b>		N/A
C.1	Protection of materials in equipment from UV radiation		N/A
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure apparatus		N/A
C.2.4	Xenon-arc light exposure apparatus		N/A
<b>D</b>	<b>TEST GENERATORS</b>		N/A
D.1	Impulse test generators		N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
<b>E</b>	<b>TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS</b>		N/A
E.1	Audio amplifier normal operating conditions		N/A
	Audio signal voltage (V)..... :	---	—
	Rated load impedance ( $\Omega$ ) ..... :	---	
E.2	Audio amplifier abnormal operating conditions		N/A
<b>F</b>	<b>EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS</b>		P
F.1	General requirements		P
	Instructions – Language ..... :	English	—
F.2	Letter symbols and graphical symbols		P
F.2.1	Letter symbols according to IEC60027-1		P
F.2.2	Graphic symbols IEC, ISO or manufacturer specific	See marking plate	P
F.3	Equipment markings		P
F.3.1	Equipment marking locations		P
F.3.2	Equipment identification markings		P

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.2.1	Manufacturer identification .....	NetModule	—
F.3.2.2	Model identification .....	NB1800	—
F.3.3	Equipment rating markings		P
F.3.3.1	Equipment with direct connection to mains	No mains	N/A
F.3.3.2	Equipment without direct connection to mains		P
F.3.3.3	Nature of supply voltage .....	==	—
F.3.3.4	Rated voltage.....	12 - 48 V== (w/o option Ep: w/o PoE) 48 V== (with option Ep: with PoE)	—
F.3.3.4	Rated frequency .....	---	—
F.3.3.6	Rated current or rated power.....	1.7 A, 20 W (w/o option Ep: w/o PoE) 1.7 A, 82 W== (with option Ep: with PoE)	—
F.3.3.7	Equipment with multiple supply connections		N/A
F.3.4	Voltage setting device		N/A
F.3.5	Terminals and operating devices		P
F.3.5.1	Mains appliance outlet and socket-outlet markings :	---	N/A
F.3.5.2	Switch position identification marking .....	---	N/A
F.3.5.3	Replacement fuse identification and rating markings .....	Not replaceable by user	N/A
F.3.5.4	Replacement battery identification marking.....	---	N/A
F.3.5.5	Terminal marking location		P
F.3.6	Equipment markings related to equipment classification		N/A
F.3.6.1	Class I Equipment		N/A
F.3.6.1.1	Protective earthing conductor terminal		N/A
F.3.6.1.2	Neutral conductor terminal		N/A
F.3.6.1.3	Protective bonding conductor terminals		N/A
F.3.6.2	Class II equipment (IEC60417-5172)		N/A
F.3.6.2.1	Class II equipment with or without functional earth		N/A
F.3.6.2.2	Class II equipment with functional earth terminal marking		N/A
F.3.7	Equipment IP rating marking .....	---	—
F.3.8	External power supply output marking		N/A
F.3.9	Durability, legibility and permanence of marking		P
F.3.10	Test for permanence of markings		P
F.4	Instructions		P
	a) Equipment for use in locations where children not likely to be present - marking		N/A
	b) Instructions given for installation or initial use		P

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Clause	Requirement + Test	Result - Remark	Verdict
	c) Equipment intended to be fastened in place		P
	d) Equipment intended for use only in restricted access area		N/A
	e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1		N/A
	f) Protective earthing employed as safeguard		N/A
	g) Protective earthing conductor current exceeding ES 2 limits		N/A
	h) Symbols used on equipment		P
	i) Permanently connected equipment not provided with all-pole mains switch		N/A
j)	j) Replaceable components or modules providing safeguard function		N/A
F.5	Instructional safeguards		N/A
	Where "instructional safeguard" is referenced in the test report it specifies the required elements, location of marking and/or instruction		N/A
<b>G</b>	<b>COMPONENTS</b>		P
<b>G.1</b>	<b>Switches</b>		N/A
G.1.1	General requirements		N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
<b>G.2</b>	<b>Relays</b>		N/A
G.2.1	General requirements		N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supply power		N/A
G.2.4	Mains relay, modified as stated in G.2		N/A
<b>G.3</b>	<b>Protection Devices</b>		P
G.3.1	Thermal cut-offs		N/A
G.3.1.1a) &b)	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
G.3.1.1c)	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Thermal cut-off connections maintained and secure		N/A
G.3.2	Thermal links		N/A
G.3.2.1a)	Thermal links separately tested with IEC 60691		N/A
G.3.2.1b)	Thermal links tested as part of the equipment		N/A
	Aging hours (H)..... :	---	—
	Single Fault Condition..... :	---	—
	Test Voltage (V) and Insulation Resistance ( $\Omega$ ) . :	---	—
G.3.3	PTC Thermistors		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.3.4	Overcurrent protection devices		P
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.5		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided	Not replaceable by user	N/A
G.3.5.2	Single faults conditions .....	(See appended Table B.4)	N/A
<b>G.4</b>	<b>Connectors</b>		P
G.4.1	Spacings		P
G.4.2	Mains connector configuration .....	No mains	N/A
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		N/A
<b>G.5</b>	<b>Wound Components</b>		N/A
G.5.1	Wire insulation in wound components .....	(See Annex J)	N/A
G.5.1.2 a)	Two wires in contact inside wound component, angle between 45° and 90°		N/A
G.5.1.2 b)	Construction subject to routine testing		N/A
G.5.2	Endurance test on wound components		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Time (s).....	---	—
	Temperature (°C).....	---	—
G.5.2.3	Wound Components supplied by mains		N/A
<b>G.5.3</b>	<b>Transformers</b>		N/A
G.5.3.1	Requirements applied (IEC61204-7, IEC61558-1/-2, and/or IEC62368-1) .....	---	N/A
	Position .....	---	—
	Method of protection .....	---	—
G.5.3.2	Insulation		N/A
	Protection from displacement of windings .....	---	—
G.5.3.3	Overload test.....	(See appended table B.3)	N/A
G.5.3.3.1	Test conditions		N/A
G.5.3.3.2	Winding Temperatures testing in the unit		N/A
G.5.3.3.3	Winding Temperatures - Alternative test method		N/A
<b>G.5.4</b>	<b>Motors</b>		N/A
G.5.4.1	General requirements		N/A
	Position .....	---	—
G.5.4.2	Test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4	Locked-rotor overload test		N/A
	Test duration (days) .....	---	—

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.4.5	Running overload test for d.c. motors in secondary circuits		N/A
G.5.4.5.2	Tested in the unit		N/A
	Electric strength test (V) : .....	---	---
G.5.4.5.3	Tested on the Bench - Alternative test method; test time (h) : .....	---	N/A
	Electric strength test (V) : .....	---	---
G.5.4.6	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature : .....	---	N/A
	Electric strength test (V) : .....	---	N/A
G.5.4.6.3	Tested on the bench - Alternative test method; test time (h) : .....	---	N/A
	Electric strength test (V) : .....	---	N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage : .....	---	---
<b>G.6</b>	<b>Wire Insulation</b>		P
G.6.1	General		P
G.6.2	Solvent-based enamel wiring insulation		N/A
<b>G.7</b>	<b>Mains supply cords</b>		N/A
G.7.1	General requirements	No mains	N/A
	Type : .....	---	---
	Rated current (A) : .....	---	---
	Cross-sectional area (mm <sup>2</sup> ), (AWG) : .....	---	---
G.7.2	Compliance and test method		N/A
G.7.3	Cord anchorages and strain relief for non-detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N) : .....	---	---
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm) ... : .....	---	---
G.7.3.2.4	Strain relief comprised of polymeric material		N/A
G.7.4	Cord Entry : .....	(See appended table 5.4.11.1)	N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Mass (g) : .....	---	---

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Clause	Requirement + Test	Result - Remark	Verdict
	Diameter (m).....:	---	---
	Temperature (°C).....:	---	---
G.7.6	Supply wiring space		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Test with 8 mm strand		N/A
<b>G.8</b>	<b>Varistors</b>		N/A
G.8.1	General requirements		N/A
G.8.2	Safeguard against shock		N/A
G.8.3	Safeguard against fire		N/A
G.8.3.2	Varistor overload test.....:	(See appended table B.3)	N/A
G.8.3.3	Temporary overvoltage.....:	(See appended table B.3)	N/A
<b>G.9</b>	<b>Integrated Circuit (IC) Current Limiters</b>		P
G.9.1 a)	Manufacturer defines limit at max. 5A.	Certified components (N410 & N2003, N2204)	P
G.9.1 b)	Limiters do not have manual operator or reset		P
G.9.1 c)	Supply source does not exceed 250 VA .....:	N410: 229 W N2003, N2204: 3.69 W	---
G.9.1 d)	IC limiter output current (max. 5A).....:	N410: 0.77 A N2003, N2204: 1.0 A (0.97 A with R1708: 25.5 kΩ)	---
G.9.1 e)	Manufacturers' defined drift .....:	N410: 0.7 A ... 0.77 A N2003, N2204: 0.6 A ... 1.0 A	---
G.9.2	Test Program 1		N/A
G.9.3	Test Program 2		N/A
G.9.4	Test Program 3		N/A
<b>G.10</b>	<b>Resistors</b>		N/A
G.10.1	General requirements		N/A
G.10.2	Resistor test		N/A
G.10.3	Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable		N/A
G.10.3.1	General requirements		N/A
G.10.3.2	Voltage surge test		N/A
G.10.3.3	Impulse test		N/A
<b>G.11</b>	<b>Capacitor and RC units</b>		N/A
G.11.1	General requirements		N/A
G.11.2	Conditioning of capacitors and RC units		N/A
G.11.3	Rules for selecting capacitors		N/A
<b>G.12</b>	<b>Optocouplers</b>		P
	Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results) .....:	Digital isolater comply with IEC 60747-5-2, electric strength test	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Type test voltage Vini .....	2'500 VAC	—
	Routine test voltage, Vini,b .....	---	—
<b>G.13</b>	<b>Printed boards</b>		P
G.13.1	General requirements		P
G.13.2	Uncoated printed boards		P
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		P
	Compliance with cemented joint requirements (Specify construction) .....	---	—
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation .....	(See appended table 5.4.4.5)	N/A
	Number of insulation layers (pcs) .....	---	—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2a)	Thermal conditioning		N/A
G.13.6.2b)	Electric strength test		N/A
G.13.6.2c)	Abrasion resistance test		N/A
<b>G.14</b>	<b>Coating on components terminals</b>		N/A
G.14.1	Requirements .....	(See G.13)	N/A
<b>G.15</b>	<b>Liquid filled components</b>		N/A
G.15.1	General requirements		N/A
G.15.2	Requirements		N/A
G.15.3	Compliance and test methods		N/A
G.15.3.1	Hydrostatic pressure test		N/A
G.15.3.2	Creep resistance test		N/A
G.15.3.3	Tubing and fittings compatibility test		N/A
G.15.3.4	Vibration test		N/A
G.15.3.5	Thermal cycling test		N/A
G.15.3.6	Force test		N/A
G.15.4	Compliance		N/A
<b>G.16</b>	<b>IC including capacitor discharge function (ICX)</b>		N/A
a)	Humidity treatment in accordance with sc5.4.8 – 120 hours		N/A
b)	Impulse test using circuit 2 with Uc = to transient voltage .....	---	N/A
C1)	Application of ac voltage at 110% of rated voltage for 2.5 minutes		N/A
C2)	Test voltage .....	---	—

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Clause	Requirement + Test	Result - Remark	Verdict
D1)	10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer		N/A
D2)	Capacitance .....	---	---
D3)	Resistance .....	---	---
<b>H</b>	<b>CRITERIA FOR TELEPHONE RINGING SIGNALS</b>		N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringling signal		N/A
H.3.1.1	Frequency (Hz) .....	---	---
H.3.1.2	Voltage (V) .....	---	---
H.3.1.3	Cadence; time (s) and voltage (V) .....	---	---
H.3.1.4	Single fault current (mA): .....	---	---
H.3.2	Tripping device and monitoring voltage.....	---	N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage complied with		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V).....	---	---
<b>J</b>	<b>INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION</b>		N/A
	General requirements	(See separate test report)	N/A
<b>K</b>	<b>SAFETY INTERLOCKS</b>		N/A
K.1	General requirements		N/A
K.2	Components of safety interlock safeguard mechanism .....	(See Annex G)	N/A
K.3	Inadvertent change of operating mode		N/A
K.4	Interlock safeguard override		N/A
K.5	Fail-safe		N/A
	Compliance .....	(See appended table B.4)	N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Compliance and Test method.....	---	N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements (type and circuit location) .....	---	N/A
K.7.2	Overload test, Current (A).....	---	N/A
K.7.3	Endurance test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
K.7.4	Electric strength test .....	(See appended table 5.4.11)	N/A
<b>L</b>	<b>DISCONNECT DEVICES</b>		P
L.1	General requirements	Plug	P
L.2	Permanently connected equipment		N/A
L.3	Parts that remain energized		N/A
L.4	Single phase equipment		N/A
L.5	Three-phase equipment		N/A
L.6	Switches as disconnect devices		N/A
L.7	Plugs as disconnect devices		P
L.8	Multiple power sources		N/A
<b>M</b>	<b>EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS</b>		N/A
M.1	General requirements		N/A
M.2	Safety of batteries and their cells		N/A
M.2.1	Requirements		N/A
M.2.2	Compliance and test method (identify method) .. :	---	N/A
M.3	Protection circuits		N/A
M.3.1	Requirements		N/A
M.3.2	Tests		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
M.3.3	Compliance .....	(See appended Tables and Annex M and M.4)	N/A
M.4	Additional safeguards for equipment containing secondary lithium battery		N/A
M.4.1	General		N/A
M.4.2	Charging safeguards		N/A
M.4.2.1	Charging operating limits		N/A
M.4.2.2a)	Charging voltage, current and temperature .....	(See Table M.4)	—
M.4.2.2 b)	Single faults in charging circuitry .....	(See Annex B.4)	—
M.4.3	Fire Enclosure		N/A
M.4.4	Endurance of equipment containing a secondary lithium battery		N/A
M.4.4.2	Preparation		N/A
M.4.4.3	Drop and charge/discharge function tests		N/A
	Drop		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Charge		N/A
	Discharge		N/A
M.4.4.4	Charge-discharge cycle test		N/A
M.4.4.5	Result of charge-discharge cycle test		N/A
M.5	Risk of burn due to short circuit during carrying		N/A
M.5.1	Requirement		N/A
M.5.2	Compliance and Test Method (Test of P.2.3)		N/A
M.6	Prevention of short circuits and protection from other effects of electric current		N/A
M.6.1	Short circuits		N/A
M.6.1.1	General requirements		N/A
M.6.1.2	Test method to simulate an internal fault		N/A
M.6.1.3	Compliance (Specify M.6.1.2 or alternative method) ..... :	---	N/A
M.6.2	Leakage current (mA) ..... :	---	N/A
M.7	Risk of explosion from lead acid and NiCd batteries		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
M.7.2	Compliance and test method		N/A
M.8	Protection against internal ignition from external spark sources of lead acid batteries		N/A
M.8.1	General requirements		N/A
M.8.2	Test method		N/A
M.8.2.1	General requirements		N/A
M.8.2.2	Estimation of hypothetical volume $V_z$ (m <sup>3</sup> /s) ..... :	---	—
M.8.2.3	Correction factors..... :	---	—
M.8.2.4	Calculation of distance $d$ (mm) ..... :	---	—
M.9	Preventing electrolyte spillage		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing) ..... :	---	N/A
<b>N</b>	<b>ELECTROCHEMICAL POTENTIALS</b>		<b>P</b>
	Metal(s) used ..... :	Aluminum/stainless steel	—
<b>O</b>	<b>MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES</b>		<b>P</b>
	Figures O.1 to O.20 of this Annex applied..... :	---	—

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Clause	Requirement + Test	Result - Remark	Verdict
<b>P</b>	<b>SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS</b>		<b>P</b>
P.1	General requirements		P
P.2.2	Safeguards against entry of foreign object		P
	Location and Dimensions (mm) ..... :	No openings	—
P.2.3	Safeguard against the consequences of entry of foreign object		N/A
P.2.3.1	Safeguards against the entry of a foreign object		N/A
	Openings in transportable equipment		N/A
	Transportable equipment with metalized plastic parts ..... :	---	N/A
P.2.3.2	Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard) ..... :	---	N/A
P.3	Safeguards against spillage of internal liquids	No internal liquids	N/A
P.3.1	General requirements		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Safeguards effectiveness		N/A
P.4	Metallized coatings and adhesive securing parts		N/A
P.4.2 a)	Conditioning testing		N/A
	Tc (°C)..... :	---	—
	Tr (°C) ..... :	---	—
	Ta (°C) ..... :	---	—
P.4.2 b)	Abrasion testing ..... :	(See G.13.6.2)	N/A
P.4.2 c)	Mechanical strength testing ..... :	(See Annex T)	N/A
<b>Q</b>	<b>CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING</b>		<b>P</b>
Q.1	Limited power sources		P
Q.1.1 a)	Inherently limited output		N/A
Q.1.1 b)	Impedance limited output		N/A
	- Regulating network limited output under normal operating and simulated single fault condition		N/A
Q.1.1 c)	Overcurrent protective device limited output		N/A
Q.1.1 d)	IC current limiter complying with G.9	Certified components (N410 & N2003, N2204)	P
Q.1.2	Compliance and test method		P
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A) ..... :	---	—
	Current limiting method..... :	---	—

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Clause	Requirement + Test	Result - Remark	Verdict
<b>R</b>	<b>LIMITED SHORT CIRCUIT TEST</b>		N/A
R.1	General requirements		N/A
R.2	Determination of the overcurrent protective device and circuit		N/A
R.3	Test method Supply voltage (V) and short-circuit current (A)). : .....	---	N/A
<b>S</b>	<b>TESTS FOR RESISTANCE TO HEAT AND FIRE</b>		N/A
S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W	Metal	N/A
	Samples, material : .....	---	---
	Wall thickness (mm) : .....	---	---
	Conditioning (°C) : .....	---	---
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		N/A
	Samples, material : .....	---	---
	Wall thickness (mm) : .....	---	---
	Conditioning (°C) : .....	---	---
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	Test specimen does not show any additional hole		N/A
S.3	Flammability test for the bottom of a fire enclosure		N/A
	Samples, material : .....	---	---
	Wall thickness (mm) : .....	---	---
	Cheesecloth did not ignite		N/A
S.4	Flammability classification of materials		N/A
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N/A
	Samples, material : .....	---	---
	Wall thickness (mm) : .....	---	---
	Conditioning (test condition), (°C)..... : .....	---	---
	Test flame according to IEC 60695-11-20 with conditions as set out		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	After every test specimen was not consumed completely		N/A
	After fifth flame application, flame extinguished within 1 min		N/A
<b>T</b>	<b>MECHANICAL STRENGTH TESTS</b>		<b>P</b>
T.1	General requirements		P
T.2	Steady force test, 10 N .....	(See appended table T.2)	P
T.3	Steady force test, 30 N .....	(See appended table T3)	P
T.4	Steady force test, 100 N .....	(See appended table T4)	N/A
T.5	Steady force test, 250 N .....	(See appended table T5)	P
T.6	Enclosure impact test	(See appended table T6)	P
	Fall test		P
	Swing test		N/A
T.7	Drop test .....	Fixed device (See appended table T7)	N/A
T.8	Stress relief test .....	(See appended table T8)	N/A
T.9	Impact Test (glass)		N/A
T.9.1	General requirements		N/A
T.9.2	Impact test and compliance		N/A
	Impact energy (J) .....	---	---
	Height (m) .....	---	---
T.10	Glass fragmentation test.....	(See sub-clause 4.4.4.9)	N/A
T.11	Test for telescoping or rod antennas		N/A
	Torque value (Nm) .....	---	---
<b>U</b>	<b>MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION</b>		<b>N/A</b>
U.1	General requirements		N/A
U.2	Compliance and test method for non-intrinsically protected CRTs		N/A
U.3	Protective Screen .....	(See Annex T)	N/A
<b>V</b>	<b>DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)</b>		<b>P</b>
V.1	Accessible parts of equipment	Enclosure & interface connectors	P
V.2	Accessible part criterion		P

4.1.2	TABLE: List of critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1</sup>	
- Description <sup>2)</sup> :	Mainboard NRHW_18-MB					
PCB NRHW_18-MB Rev. 2.6	Wuerth Elektronik GmbH & Co	50	FR-4 UL94 V-0 1.6 mm 130 °C	UL 796 CSA C22.2 No. 0.17	cURus E76251	
	Interchangeable	Interchange- able	FR-4 UL94 V-0 1.6 mm 130 °C	UL 796	UL listed	
Connector X2400	Phoenix Contact GmbH & Co	MC 1.5/ 5-GF -3.5	300 V, 8 A 5-pol.	UL 1059 CSA C22.2 No. 158	VDE cURus E60425	
Connector X2401	Japan Solderless Terminal MFG Co Ltd	BM02B- XASS-TF	250 V, 3 A 2-pol.	UL 1977 CSA-C22.2 No. 182.3	TÜV R9851220 cURus E60389 CSA LR20812	
Fuse FI2400	Littelfuse Inc	RKEF500	60 VDC I <sub>hold</sub> : 5 A I <sub>trip</sub> : 10 A	IEC 60730-1 UL 60730-1 CSA E60730-1	TÜV UR E74889 CSA CA78165	
Transient voltage suppressor D2400	Diodes Inc	SMCJ58A	Unidirectional, 58 V	UL 497B	UR E156346	
	Taiwan Semiconductor Co Ltd	SMCJ58A	Unidirectional, 58 V	UL1557	UR E326243	
	Pan Jit Electronics Co Ltd	SMCJ58A	Unidirectional, 58 V	UL 497B	UR E210467	
Ethernet connector X1802	Dongguan Jiabao Electronic Co Ltd	JA06629XX5- 62G36	1000 Base-TX 2x 8-pol. 1'500 VAC	IEC/EN 62368-1	Tested in appliance	
Current limiter N2003, N2204	Diodes Inc	AP2151WG	5.5 VDC, prot. current: 1.0 A	IEC 60950-1 UL 2367	CB UR E322375	
- Description <sup>2)</sup> :	Ext_Board_4xETH_PoE					
PCB 4xETH_PoE_Power Rev. 2.0	Wuerth Elektronik GmbH & Co	50	FR-4 UL94 V-0 1.6 mm 130 °C	UL 796 CSA C22.2 No. 0.17	cURus E76251	
	Interchangeable	Interchange- able	FR-4 UL94 V-0 1.6 mm 130 °C	UL 796	UL listed	

4.1.2	TABLE: List of critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1</sup>	
Connector X200	Japan Solderless Terminal MFG Co Ltd	BM02B- XASS-TF	250 V, 3 A 2-pol.	UL 1977 CSA-C22.2 No. 182.3	TÜV R9851220 cURus E60389 CSA LR20812	
DC/DC converter N900	Delta Electronics (Thailand) Public Co Ltd	Delphi Series Q48SA54001 NNFH	In: 36 - 75 V, 3.5 A Out: 54 V, 1.5 A 2'250 VDC	UL 60950-1 CSA C22.2 No. 60950-1	cURus E191395	
DC/DC converter U1000	Murata Power Solutions Inc	NXE1S0505M C	In: 5 V, 303 mA Out: 5 V, 200 mA 3'000 VDC	UL 60950-1 CSA C22.2 No. 60950-1	cURus E151252	
	Recom Power	R1SX-0505/H- R	In: 5 V Out: 5 V, 200 mA 3'000 VDC	IEC/EN 62368-1 UL 62368-1 CSA C22.2 No. 62368-1	CB L0339m29- CB-1-B cURus E224736	
Digital isolator U1001	Silicon Laboratories Inc	SI8663AB	2'500 VAC	IEC 60747-5-2 IEC 60950-1 UL 1577	VDE UR E257455 CSA 232873	
PSE PoE Manager N1300	Microsemi Corp	PD69104	57 VDC, prot. current: 775 mA	UL 2367	UR E357182	
Ethernet Transformer T600, T700	Huizhou Link-PP Electronics Limited Co	LP6080NL	IEEE 802.3at 1'500 VAC	UL 60950-1	UR E484635	
Ethernet connector X600, X700	Huizhou Link-PP Electronics Limited Co	LPJE201- 0AWN	2x 8-pol. 1'000 VAC	UL 60950-1	UR E484635	
Capacitor C613, C627, C713, C729	AVX	1210GC102M AT1A	1 nF 2'000 V	IEC/EN 62368-1	Tested in appliance	
Capacitor C907	AVX	1812GA102JA T2A	1 nF 2'000 V	IEC/EN 62368-1	Tested in appliance	
Capacitor C909	Yageo	CC1812KKX7 RDBB10	10 nF 2'000 V	IEC/EN 62368-1	Tested in appliance	
- Description <sup>2)</sup> :	Other components					
Plug of internal wiring	Japan Solderless Terminal MFG Co Ltd	SXA-001T- P0.6, XAP-02V-1	250 V, 3 A 2-pol. 28 ... 20 AWG	UL 1977 CSA-C22.2 No. 182.3	TÜV R9851220 cURus E60389 CSA LR20812	
Internal wiring	Alpha Wire Co	B955021 AWM style 2464	300 V 2x 20 AWG 80 °C VW-1	UL 758	CE cURus E163869	

4.1.2	TABLE: List of critical components					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1</sup>	
WWAN module	Huawei Technologies	ME909u-521	compliant with communication standards	LTE, UMTS, GSM, GPRS, EDGE	CE0682 FCC	
WLAN module	Compex Systems	WLE600VX	compliant with communication standards	Dual-band 802.11ac	CE0678 FCC	
Enclosure	NetModule AG	NB1800	Stainless steel min. 1.0	IEC/EN 62368-1	Tested in appliance	
Supplementary information: <sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039. <sup>2)</sup> Description line content is optional. Main line description needs to clearly detail the component used for testing						

4.8.4, 4.8.5	TABLE: Lithium coin/button cell batteries mechanical tests			N/A
(The following mechanical tests are conducted in the sequence noted.)				
4.8.4.2	TABLE: Stress Relief test			—
Part		Material	Oven Temperature (°C)	Comments
4.8.4.3	TABLE: Battery replacement test			—
Battery part no. ....				—
Battery Installation/withdrawal		Battery Installation/Removal Cycle		Comments
		1		
		2		
		3		
		4		
		5		
		6		
		8		
		9		
10				
4.8.4.4	TABLE: Drop test			—
Impact Area		Drop Distance	Drop No.	Observations
			1	
			2	
			3	
4.8.4.5	TABLE: Impact			—
Impacts per surface		Surface tested	Impact energy (Nm)	Comments

4.8.4, 4.8.5	TABLE: Lithium coin/button cell batteries mechanical tests			N/A
(The following mechanical tests are conducted in the sequence noted.)				
4.8.4.6	TABLE: Crush test			—
Test position		Surface tested	Crushing Force (N)	Duration force applied (s)
Supplementary information:				

4.8.5	<b>TABLE: Lithium coin/button cell batteries mechanical test result</b>			N/A
<b>Test position</b>		<b>Surface tested</b>	<b>Force (N)</b>	<b>Duration force applied (s)</b>
Supplementary information:				

5.2	Table: Classification of electrical energy sources						P
5.2.2.2 – Steady State Voltage and Current conditions							
No.	Supply Voltage	Location  (e.g. circuit designation)	Test conditions	Parameters			ES Class
				U (Vrms or Vpk)	I (A <sub>pk</sub> or A <sub>rms</sub> )	Hz	
1	52.8 VDC	Power input circuits	Normal	48 VDC	---	---	ES1
			Abnormal	52.8 VDC	---	---	
			Single fault – OC/SC	52.8 VDC / 0 VDC	---	---	
2	52.8 VDC	Output of DC/DC converter  (N900)	Normal	53.7 VDC	---	---	ES1
			Abnormal	55.1 VDC	---	---	
			Single fault – OC/SC	55.1 V <sub>p</sub> / 0 VDC	---	---	
4	52.8 VDC	+5V0, USB interface	Normal	5.07 VDC	---	---	ES1
			Abnormal	5.07 VDC	---	---	
			Single fault – OC/SC	5.07 VDC / 0 VDC	---	---	

5.2.2.3 - Capacitance Limits							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters		ES Class	
				Capacitance, nF	Upk (V)		
---	---	---	Normal	---	---	---	
			Abnormal	---	---		
			Single fault – SC/OC	---	---		
5.2.2.4 - Single Pulses							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Duration (ms)	Upk (V)	Ipk (mA)	
---	---	---	Normal	---	---	---	---
			Abnormal	---	---	---	
			Single fault – SC/OC	---	---	---	
5.2.2.5 - Repetitive Pulses							
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			ES Class
				Off time (ms)	Upk (V)	Ipk (mA)	
---	---	---	Normal	---	---	---	---
			Abnormal	---	---	---	
			Single fault – SC/OC	---	---	---	
Test Conditions: Normal – Abnormal - Supplementary information: SC=Short Circuit, OC=Open Circuit							

5.4.1.4, 6.3.2, 9.0, B.2.6	TABLE: Temperature measurements					P	
	Supply voltage (V) .....	52.8 VDC	10.2 VDC	52.8 VDC <sub>2)</sub>	43.2 VDC <sub>2)</sub>	—	
	Ambient T <sub>min</sub> (°C) .....	23.5	24.1	24.4	24.6	—	
	Ambient T <sub>max</sub> (°C) .....	24.1	24.6	24.9	24.9	—	
	T <sub>ma</sub> (°C) .....	70 <sup>1)</sup>	70 <sup>1)</sup>	50 <sup>2)</sup>	50 <sup>2)</sup>	—	
Maximum measured temperature T of part/at:		T (°C)				Allowed T <sub>max</sub> (°C)	
Surface temperatures of NB1800:							
Enclosure (top, near antenna connectors)		34.6	34.2	---	---	51	
Cooling fins (above U100)		38.0	37.2	---	---	60	
Power connector		34.5	33.5	---	---	60	
Ethernet connector		35.0	34.0	---	---	51	
Antenna connectors		35.8	34.8	---	---	51	
Component temperatures of NB1800:							
Inner air temperature		36.5 82.4 <sup>1)</sup>	35.5 80.9 <sup>1)</sup>	---	---	85	
Surface temperatures of NB1810:							
Enclosure (top, near antenna connectors)		---	---	49.5	49.6	51	
Cooling fins (above DC/DC converter N900)		---	---	52.0	52.2	60	
Power connector		---	---	46.0	46.9	60	
Ethernet connector		---	---	46.7	47.1	51	
Antenna connectors		---	---	49.7	49.8	51	
Component temperatures of NB1810:							
DC/DC converter N900		---	---	52.2 77.3 <sup>2)</sup>	52.4 77.5 <sup>2)</sup>	115 <sup>3)</sup>	
Inner air temperature		---	---	59.3 84.4 <sup>2)</sup>	59.8 84.9 <sup>2)</sup>	85	
Supplementary information:							
PoE feeds two loads (28.8 W each) PoE does not work at input voltages < 20 V							
<sup>1)</sup> NB1800 w/o option Ep: w/o PoE, calculated temperatures for max. T <sub>ma</sub> : 50 °C <sup>2)</sup> NB1810 with option Ep: with PoE, calculated temperatures for max. T <sub>ma</sub> : 70 °C <sup>3)</sup> Max. case temperature of DC/DC converter N900: 115 °C							
Note: This test covers only safety aspects; functional failures due to the temperatures are not considered							
Temperature T of winding:	t <sub>1</sub> (°C)	R <sub>1</sub> (Ω)	t <sub>2</sub> (°C)	R <sub>2</sub> (Ω)	T (°C)	Allowed T <sub>max</sub> (°C)	Insulation class
---	---	---	---	---	---	---	---
Supplementary information:							
Note 1: T <sub>ma</sub> should be considered as directed by applicable requirement							
Note 2: T <sub>ma</sub> is not included in assessment of Touch Temperatures (Clause 9)							

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics		N/A
Penetration (mm) .....			—
Object/ Part No./Material	Manufacturer/t rademark	T softening (°C)	
supplementary information:			

5.4.1.10.3	TABLE: Ball pressure test of thermoplastics			N/A
Allowed impression diameter (mm) .....		≤ 2 mm		—
Object/Part No./Material	Manufacturer/trademark	Test temperature (°C)	Impression diameter (mm)	
Supplementary information:				

<b>5.4.2.2, 5.4.2.4 and 5.4.3</b>	<b>TABLE: Minimum Clearances/Creepage distance</b>						P
Clearance (cl) and creepage distance (cr) at/of/between:	Up (V)	U r.m.s. (V)	Frequency (kHz) <sup>1</sup>	Required cl (mm)	cl (mm) <sup>2</sup>	Required <sup>3</sup> cr (mm)	cr (mm)
Functional:							
---	---	---	---	---	---	---	---
Basic/supplementary:							
PWR_IN to PWR_GND Power input before fuse FI2400	1'500	52.8	---	1.0 <sup>1)</sup>	1.5	1.25	1.5
Reinforced:							
---	---	---	---	---	---	---	---
Supplementary information: <sup>1)</sup> For operating up to 4'000 m sea level (multiplication factor = 1.29) 0.76 mm * 1.29 = 0.98 mm => 1.0 mm clearance  Note 1: Only for frequency above 30 kHz Note 2: See table 5.4.2.4 if this is based on electric strength test Note 3: Provide Material Group							

5.4.2.3	TABLE: Minimum Clearances distances using required withstand voltage			P
	Overvoltage Category (OV):			I
	Pollution Degree:			2
Clearance distanced between:		Required withstand voltage	Required cl (mm)	Measured cl (mm)
Ethernet signal lines to enclosure (including USB, RS-232, power supply)		1'500 Vp	0.65	1.3
Supplementary information: 1) For operating up to 4'000 m sea level (multiplication factor = 1.29) 0.5 mm * 1.29 = 0.645 mm => 0.65 mm clearance				

5.4.2.4	TABLE: Clearances based on electric strength test			N/A
Test voltage applied between:		Required cl (mm)	Test voltage (kV) peak/ r.m.s. / d.c.	Breakdown Yes / No
Supplementary information:				

5.4.4.2, 5.4.4.5 c) 5.4.4.9	TABLE: Distance through insulation measurements					N/A
Distance through insulation di at/of:	Peak voltage (V)	Frequency (kHz)	Material	Required DTI (mm)	DTI (mm)	
Supplementary information:						

<b>5.4.9</b>	<b>TABLE: Electric strength tests</b>			<b>P</b>
Test voltage applied between:		Voltage shape (AC, DC)	Test voltage (V)	Breakdown Yes / No
Functional:				
---		---	---	---
Basic/supplementary:				
PWR_IN to PWR_GND Power input before fuse FI2400		DC	1'725 <sup>1)</sup>	No
Ethernet signal lines to enclosure (including USB, RS-232, power supply)		DC	1'725 <sup>1)</sup>	No
Reinforced:				
---		---	---	---
Routine Tests:				
---		---	---	---
Supplementary information: <sup>1)</sup> For operating up to 4'000 m sea level (multiplication factor = 1.15) 1'500 V * 1.15 = 1'725 V				

5.5.2.2	TABLE: Stored discharge on capacitors					N/A
Supply Voltage (V), Hz	Test Location	Operating Condition (N, S)	Switch position On or off	Measured Voltage (after 2 seconds)	ES Classification	
Supplementary information: X-capacitors installed for testing are: <input type="checkbox"/> bleeding resistor rating: <input type="checkbox"/> ICX: Notes: A. Test Location: Phase to Neutral; Phase to Phase; Phase to Earth; and/or Neutral to Earth B. Operating condition abbreviations: N – Normal operating condition (e.g., normal operation, or open fuse); S – Single fault condition						

<b>5.6.6.2</b>	<b>TABLE: Resistance of protective conductors and terminations</b>				N/A
Accessible part	Test current (A)	Duration (min)	Voltage drop (V)	Resistance ( $\Omega$ )	
Supplementary information:					

<b>5.7.2.2, 5.7.4</b>	<b>TABLE: Earthed accessible conductive part</b>		N/A
Supply voltage .....			—
Location		Test conditions specified in 6.1 of IEC 60990 or Fault Condition No in IEC 60990 clause 6.2.2.1 through 6.2.2.8, except for 6.2.2.7	Touch current (mA)
		1	
		2*	
		3	
		4	
		5	
		6	
		8	
Supplementary Information:			
Notes: [1] Supply voltage is the anticipated maximum Touch Voltage [2] Earthed neutral conductor [Voltage differences less than 1% or more] [3] Specify method used for measurement as described in IEC 60990 sub-clause 4.3 [4] IEC60990, sub-clause 6.2.2.7, Fault 7 not applicable. [5] (*) IEC60990, sub-clause 6.2.2.2 is not applicable if switch or disconnect device (e.g., appliance coupler) provided.			

6.2.2	Table: Electrical power sources (PS) measurements for classification					P
Source	Description	Measurement	Max Power after 3 s	Max Power after 5 s <sup>*)</sup>	PS Classification	
A	Power input circuits	Power (W) :	330	---	PS3	
		V <sub>A</sub> (V) :	52.8	---		
		I <sub>A</sub> (A) :	6.25	---		
B	Output of DC/DC converter (N900)	Power (W) :	105.7	---	PS3	
		V <sub>A</sub> (V) :	53.4	---		
		I <sub>A</sub> (A) :	1.98	---		
C	PoE interfaces	Power (W) :	64.2	---	PS2	
		V <sub>A</sub> (V) :	53.5	---		
		I <sub>A</sub> (A) :	1.2	---		
E	USB interface	Power (W) :	3.69	---	PS1	
		V <sub>A</sub> (V) :	4.5	---		
		I <sub>A</sub> (A) :	0.82	---		
Supplementary Information: (*) Measurement taken only when limits at 3 seconds exceed PS1 limits						

6.2.3.1		Table: Determination of Potential Ignition Sources (Arcing PIS)			P
Location		Open circuit voltage After 3 s (V <sub>p</sub> )	Measured r.m.s current (I <sub>rms</sub> )	Calculated value (V <sub>p</sub> x I <sub>rms</sub> )	Arcing PIS? Yes / No
Power input circuits		52.8	1.47	77.6	Yes
Supplementary information:					
An Arcing PIS requires a minimum of 50 V (peak) a.c. or d.c. An Arcing PIS is established when the product of the open circuit voltage (V <sub>p</sub> ) and normal operating condition rms current (I <sub>rms</sub> ) is greater than 15.					

6.2.3.2	Table: Determination of Potential Ignition Sources (Resistive PIS)				P
Circuit Location (x-y)	Operating Condition (Normal / Describe Single Fault)	Measured wattage or VA During first 30 s (W / VA)	Measured wattage or VA After 30 s (W / VA)	Protective Circuit, Regulator, or PTC Operated? Yes / No (Comment)	Resistive PIS? Yes/No
Power input circuits	Normal	77.6	77.6	No	Yes
Power input circuits	Before fuse FI2400 melts	330	330	No	Yes
Supplementary Information:					
A combination of voltmeter, VA and ammeter IA may be used instead of a wattmeter. If a separate voltmeter and ammeter are used, the product of (VA x IA) is used to determine Resistive PIS classification. A Resistive PIS: (a) dissipates more than 15 W, measured after 30 s of normal operation, <u>or</u> (b) under single fault conditions has either a power exceeding 100 W measured immediately after the introduction of the fault if electronic circuits, regulators or PTC devices are used, or has an available power exceeding 15 W measured 30 s after introduction of the fault.					

8.5.5	TABLE: High Pressure Lamp		N/A
Description	Values	Energy Source Classification	
Lamp type..... :		—	
Manufacturer ..... :		—	
Cat no. .... :		—	
Pressure (cold) (MPa) ..... :		MS_	
Pressure (operating) (MPa) ..... :		MS_	
Operating time (minutes) ..... :		—	
Explosion method..... :		—	
Max particle length escaping enclosure (mm) :		MS_	
Max particle length beyond 1 m (mm) ..... :		MS_	
Overall result ..... :			
Supplementary information:			

B.2.5		TABLE: Input test						P
U (V)	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status	
w/o option Ep: w/o PoE								
10.2	0.562	1.7	5.73	20	FI2400	5	Data transfer via wireless modules	
12.0	0.481	1.7	5.77	20	FI2400	5	Data transfer via wireless modules	
48.0	0.136	1.7	6.53	20	FI2400	5	Data transfer via wireless modules	
52.8	0.125	1.7	6.60	20	FI2400	5	Data transfer via wireless modules	
with option Ep: with PoE								
43.2	1.79	1.8	77.3	87	FI2400	5	Data transfer via wireless modules, PoE activated	
48.0	1.61	1.8	77.3	87	FI2400	5	Data transfer via wireless modules, PoE activated	
52.8	1.47	1.8	77.6	87	FI2400	5	Data transfer via wireless modules, PoE activated	
Supplementary information: Equipment may be have rated current or rated power or both. Both should be measured  PoE feeds two loads (28.8 W each) PoE does not work at input voltages < 20 V								

<b>B.3</b>	<b>TABLE: Abnormal operating condition tests</b>							<b>P</b>
Ambient temperature (°C) .....					25			—
Power source for EUT: Manufacturer, model/type, output rating ...					See below			—
Component No.	Abnormal Condition	Supply voltage, (V)	Test time (min)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation
X100	reverse polarity	52.8	30	---	---	---	---	Coded plug
X2209	any load	52.8	30	---	---	---	---	Max. current: 0.82 A @ 4.5 V, certified thermal protected current limiter N2204, no hazard
Supplementary information: Test table is provided to record abnormal and fault conditions for all applicable energy sources including Thermal burn injury. Column "Abnormal/Fault." Specify if test condition by indicating "Abnormal" then the condition for a Clause B.3 test or "Single Fault" then the condition for Clause B.4.								

B.4		TABLE: Fault condition tests							P
Ambient temperature (°C) .....					25			—	
Power source for EUT: Manufacturer, model/type, output rating ...					See below			—	
Component No.	Fault Condition	Supply voltage, (V)	Test time (min)	Fuse no.	Fuse current, (A)	T-couple	Temp. (°C)	Observation	
Mainboard NRHW_18-MB									
D2400, C2400, C2401, C2404	short circuit after fuse FI2400	52.8	---	FI 2400	5 A	---	---	Fuse FI2400 trips, no hazard	
C2520	short circuit +5V0	52.8	---	---	---	---	---	Short circuit and thermal protected voltage regulator N2500, no hazard	
C2536, C2537	short circuit +3V3	52.8	---	---	---	---	---	Short circuit and thermal protected voltage regulator U2500, no hazard	
X2209	short circuit VBUS (USB)	52.8	---	---	---	---	---	Certified thermal protected current limiter N2204 no hazard	
Ext_Board_4xETH_PoE									
C901, C903	short circuit +53V5_IS O	52.8	10	---	---	---	---	Certified DC/DC converter N900 (Imax: 288 mA), no hazard	
C1002	short circuit +5V0_ISO	52.8	---	---	---	---	---	Certified DC/DC converter U1000, no hazard	
C1005	short circuit +3V3_ISO	52.8	---	---	---	---	---	Thermal protected voltage regulator N1000, no hazard	
Supplementary information: If no test time is declared test has not been carried out because considering the situation. All components within metallic enclosure without openings.									

Annex M	TABLE: Batteries								N/A	
The tests of Annex M are applicable only when appropriate battery data is not available									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										
- Explosion of the battery										
- Emission of flame or expulsion of molten metal										
- Electric strength tests of equipment after completion of tests										
Supplementary information:										

Annex M.4	Table: Additional safeguards for equipment containing secondary lithium batteries					N/A
Battery/Cell No.	Test conditions	Measurements			Observation	
		U	I (A)	Temp (C)		
	Normal					
	Abnormal					
	Single fault –SC/OC					
	Normal					
	Abnormal					
	Single fault – SC/OC					
Supplementary Information:						

Battery identification	Charging at $T_{lowest}$ (°C)	Observation	Charging at $T_{highest}$ (°C)	Observation
Supplementary Information:				

Annex Q.1	TABLE: Circuits intended for interconnection with building wiring (LPS)					P
Note: Measured UOC (V) with all load circuits disconnected:						
Output Circuit	Components	U <sub>oc</sub> (V)	I <sub>sc</sub> (A)		S (VA)	
			Meas.	Limit	Meas.	Limit
PoE interfaces	X600, X700	53.5	Max. 0.77	2.8	41.2	100
Supplementary Information: SC=Short circuit, OC=Open circuit						

<b>T.2, T.3, T.4, T.5</b>	<b>TABLE: Steady force test</b>					<b>P</b>
Part/Location	Material	Thickness (mm)	Force (N)	Test Duration (sec)	Observation	
Internal wire	PVC	---	10	5	No hazard	
Enclosure	Metal	Min. 1.0	30	5	No hazard	
Enclosure	Metal	Min. 1.0	250	5	No hazard	
Supplementary information:						

<b>T.6, T.9</b>	<b>TABLE: Impact tests</b>				<b>P</b>
Part/Location	Material	Thickness (mm)	Vertical distance (mm)	Observation	
Whole product	Metallic enclosure	Min. 1.0	1'300	No hazard	
Supplementary information:					

<b>T.7</b>	<b>TABLE: Drop tests</b>				<b>N/A</b>
Part/Location	Material	Thickness (mm)	Drop Height (mm)	Observation	
Supplementary information: Fixed device					

<b>T.8</b>	<b>TABLE: Stress relief test</b>					N/A
Part/Location	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation	
Supplementary information:						

**List of test equipment used:**

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to TMP/CTF stage 1 or WMT/CTF stage 2 procedure has been used.

Clause	Measurement / testing	Testing / measuring equipment / material used	Inventory no	Last calibration	Calibration due
all	Ambient conditions	Comet Systems, T7610, Thermo-/Hygro-/Barometer	18.6632.04	02/2018	02/2019
5.2, 6.2, B.2.5, B.3, B.4	Electrical data, fault condition tests	Fluke, 189, Digital Multimeter	DV9771	11/2017	11/2018
5.2, 6.2, B.2.5, B.3, B.4	Electrical data, fault condition tests	Fluke, 189, Digital Multimeter	DV9992	07/2017	07/2018
5.2, 6.2, B.2.5, B.3, B.4	Electrical data, fault condition tests	Fluke, 87, Digital Multimeter	DV6681	04/2018	04/2019
5.3.2	Accessibility to electrical energy sources	Siemens, IEC 61032 Fig. 2B, Test Pin IEC 60950-1	MG9701	10/2016	10/2019
5.3.2	Accessibility to electrical energy sources	Siemens, EN 60950:2000, Test Probe IEC 60950-1 Fig. 2C	MG9703	09/2017	09/2020
5.4.2, 5.4.3	Clearances, creepage distances	Etalon, 0 - 150 mm, Caliper Gauge	M9702	09/2017	09/2018
5.4.1.4, 6.3.2, 9.0, B.2.6	Temperature measurements, fault condition tests	Fluke, 52, Digital Thermometer for K/J Thermocouples	18.6722.04	03/2018	03/2019
5.4.1.4, 6.3.2, 9.0, B.2.6	Temperature measurements, fault condition tests	Omega, TC-K 0.01, Thermocouples	18.6632.08.1, 18.6632.08.2, 18.6632.08.3, 18.6632.08.4, 18.6632.08.5	05/2018	05/2021
5.4.9, 5.5.10	Electric strength tests	ETL, ATS400, High Voltage Tester	14.6632.03	07/2017	07/2018

All measurements carried out during 05/2018.

<b>ATTACHMENT TO TEST REPORT</b> <b>IEC 62368-1</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> (Audio/video, information and communication technology equipment Part 1: Safety requirements)	
Differences according to :	EN 62368-1:2014+A11:2017
Attachment Form No. :	EU_GD_IEC62368_1B_II
<b>Attachment Originator :</b>	<b>Nemko AS</b>
Master Attachment:	Date 2017-09-22
<b>Copyright © 2017 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.</b>	

IEC62368_1B - ATTACHMENT																																										
Clause	Requirement + Test			Result - Remark		Verdict																																				
	<b>CENELEC COMMON MODIFICATIONS (EN)</b>					P																																				
	Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2014 are prefixed “Z”.					P																																				
CONTENTS	<b>Add</b> 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 Annex ZD (informative) IEC and CENELEC code designations for flexible cords					P																																				
	<b>Delete</b> all the “country” notes in the reference document (IEC 62368-1:2014) according to the following list: <table><tr><td>0.2.1</td><td>Note</td><td>1</td><td>Note 3</td><td>4.1.15</td><td>Note</td></tr><tr><td>4.7.3</td><td>Note 1 and 2</td><td>5.2.2.2</td><td>Note</td><td>5.4.2.3.2.2 Table 13</td><td>Note c</td></tr><tr><td>5.4.2.3.2.4</td><td>Note 1 and 3</td><td>5.4.2.5</td><td>Note 2</td><td>5.4.5.1</td><td>Note</td></tr><tr><td>5.5.2.1</td><td>Note</td><td>5.5.6</td><td>Note</td><td>5.6.4.2.1</td><td>Note 2 and 3</td></tr><tr><td>5.7.5</td><td>Note</td><td>5.7.6.1</td><td>Note 1 and 2</td><td>10.2.1 Table 39</td><td>Note 2, 3 and 4</td></tr><tr><td>10.5.3</td><td>Note 2</td><td>10.6.2.1</td><td>Note 3</td><td>F.3.3.6</td><td>Note 3</td></tr></table>					0.2.1	Note	1	Note 3	4.1.15	Note	4.7.3	Note 1 and 2	5.2.2.2	Note	5.4.2.3.2.2 Table 13	Note c	5.4.2.3.2.4	Note 1 and 3	5.4.2.5	Note 2	5.4.5.1	Note	5.5.2.1	Note	5.5.6	Note	5.6.4.2.1	Note 2 and 3	5.7.5	Note	5.7.6.1	Note 1 and 2	10.2.1 Table 39	Note 2, 3 and 4	10.5.3	Note 2	10.6.2.1	Note 3	F.3.3.6	Note 3	P
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10.5.3	Note 2	10.6.2.1	Note 3	F.3.3.6	Note 3																																					
	For special national conditions, see Annex ZB.					P																																				
1	<b>Add</b> the following note: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.					P																																				

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
4.Z1	<p><b>Add</b> the following new subclause after 4.9: To protect against excessive current, short-circuits and earth faults in circuits connected to an a.c. <b>mains</b>, 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):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of B.3.1 and B.4 shall be included as parts of the equipment;</p> <p>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;</p> <p>c) it is permitted for <b>pluggable equipment type B</b> or <b>permanently connected equipment</b>, 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.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for <b>pluggable equipment type A</b> the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>		N/A
5.4.2.3.2.4	<p><b>Add</b> the following to the end of this subclause: The requirement for interconnection with <b>external circuit</b> is in addition given in EN 50491-3:2009.</p>		P
10.2.1	<p><b>Add</b> the following to c) and d) in table 39: For additional requirements, see 10.5.1.</p>		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
10.5.1	<p><b>Add</b> the following after the first paragraph:  <i>For RS 1 compliance is checked by measurement under the following conditions:</i>  <i>In addition to the normal operating conditions, all controls adjustable from the outside by hand, by any object such as a tool or a coin, and those internal adjustments or presets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made.</i>            NOTE Z1 Soldered joints and paint lockings are examples of adequate locking.  <i>The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm<sup>2</sup>, at any point 10 cm from the outer surface of the apparatus.</i>  <i>Moreover, the measurement shall be made under fault conditions causing an increase of the high-voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made.</i>  <i>For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level.</i>            NOTE Z2 These values appear in Directive 96/29/Euratom of 13 May 1996.</p>		N/A
10.6.1	<p><b>Add</b> the following paragraph to the end of the subclause:            EN 71-1:2011, 4.20 and the related tests methods and measurement distances apply.</p>		N/A
10.Z1	<p><b>Add</b> the following new subclause after 10.6.5.  <b>10.Z1 Non-ionizing radiation from radio frequencies in the range 0 to 300 GHz</b>            The amount of non-ionizing radiation is regulated by European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz).            For intentional radiators, ICNIRP guidelines should be taken into account for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). For hand-held and body-mounted devices, attention is drawn to EN 50360 and EN 50566</p>	Due to the EMC tests	P
G.7.1	<p><b>Add</b> the following note:            NOTE Z1 The harmonized code designations corresponding to the IEC cord types are given in Annex ZD.</p>		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
Bibliography	<p><b>Add</b> the following standards:</p> <p><b>Add</b> the following notes for the standards indicated:</p> <p>IEC 60130-9 NOTE Harmonized as EN 60130-9.</p> <p>IEC 60269-2 NOTE Harmonized as HD 60269-2.</p> <p>IEC 60309-1 NOTE Harmonized as EN 60309-1.</p> <p>IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series.</p> <p>IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4.</p> <p>IEC 60664-5 NOTE Harmonized as EN 60664-5.</p> <p>IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified).</p> <p>IEC 61508-1 NOTE Harmonized as EN 61508-1.</p> <p>IEC 61558-2-1 NOTE Harmonized as EN 61558-2-1.</p> <p>IEC 61558-2-4 NOTE Harmonized as EN 61558-2-4.</p> <p>IEC 61558-2-6 NOTE Harmonized as EN 61558-2-6.</p> <p>IEC 61643-1 NOTE Harmonized as EN 61643-1.</p> <p>IEC 61643-21 NOTE Harmonized as EN 61643-21.</p> <p>IEC 61643-311 NOTE Harmonized as EN 61643-311.</p> <p>IEC 61643-321 NOTE Harmonized as EN 61643-321.</p> <p>IEC 61643-331 NOTE Harmonized as EN 61643-331.</p>		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
<b>ZB</b>	<b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>		N/A
4.1.15	<p><b>Denmark, Finland, Norway and Sweden</b></p> <p>To the end of the subclause the following is added:</p> <p><b>Class I pluggable equipment type A</b> intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and <b>accessible</b> parts, have a marking stating that the equipment shall be connected to an earthed <b>mains</b> socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In <b>Denmark</b>: "Apparatets stikprop skal tilsluttes en stikkontakt med jord som giver forbindelse til stikproppens jord."</p> <p>In <b>Finland</b>: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"</p> <p>In <b>Norway</b>: "Apparatet må tilkoples jordet stikkontakt"</p> <p>In <b>Sweden</b>: "Apparaten skall anslutas till jordat uttag"</p>		N/A
4.7.3	<p><b>United Kingdom</b></p> <p>To the end of the subclause the following is added:</p> <p>The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363.</p> <p>Also see Annex G.4.2 of this annex</p>		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.2.2.2	<b>Denmark</b> After the 2nd paragraph add the following: A warning (marking <b>safeguard</b> ) for high <b>touch current</b> is required if the <b>touch current</b> exceeds the limits of 3,5 mA a.c. or 10 mA d.c		N/A
5.4.11.1 and Annex G	<b>Finland and Sweden</b> To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either <ul style="list-style-type: none"> <li>• two layers of thin sheet material, each of which shall pass the electric strength test below, or</li> <li>• one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.</li> </ul> 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 <ul style="list-style-type: none"> <li>• passes the tests and inspection criteria of 5.4.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1.5 kV), and</li> <li>• is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5kV.</li> </ul> It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2. A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions: <ul style="list-style-type: none"> <li>• the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.11;</li> <li>• the additional testing shall be performed on all the test specimens as described in EN 60384-14; the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.</li> </ul>		N/A
5.5.2.1	<b>Norway</b> After the 3rd paragraph the following is added: Due to the IT power system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.5.6	<b>Finland, Norway and Sweden</b> To the end of the subclause the following is added: Resistors used as <b>basic safeguard</b> or bridging <b>basic insulation</b> in <b>class I pluggable equipment type A</b> shall comply with G.10.1 and the test of G.10.2.		N/A
5.6.1	<b>Denmark</b> <b>Add</b> to the end of the subclause Due to many existing installations where the socket-outlets can be protected with fuses with higher rating than the rating of the socket-outlets the protection for pluggable equipment type A shall be an integral part of the equipment. <i>Justification:</i> In Denmark an existing 13 A socket outlet can be protected by a 20 A fuse.		N/A
5.6.4.2.1	<b>Ireland and United Kingdom</b> After the indent for <b>pluggable equipment type A</b> , the following is added: – the <b>protective current rating</b> is taken to be 13 A, this being the largest rating of fuse used in the <b>mains</b> plug.		N/A
5.6.5.1	To the second paragraph the following is added: The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1.25 mm <sup>2</sup> to 1.5 mm <sup>2</sup> in cross-sectional area.		N/A
5.7.5	<b>Denmark</b> To the end of the subclause the following is added: The installation instruction shall be affixed to the equipment if the <b>protective conductor current</b> exceeds the limits of 3.5 mA a.c. or 10 mA d.c.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
5.7.6.1	<p><b>Norway and Sweden</b></p> <p>To the end of the subclause the following is added:</p> <p>The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: "Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)"</p> <p>NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway):  "Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet."  Translation to Swedish:  "Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet."</p>		N/A
5.7.6.2	<p><b>Denmark</b></p> <p>To the end of the subclause the following is added:</p> <p>The warning (marking safeguard) for high touch current is required if the touch current or the protective current exceed the limits of 3.5 mA .</p>		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
B.3.1 and B.4	<p><b>Ireland and United Kingdom</b></p> <p>The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of <b>direct plug-in equipment</b>, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the <b>direct plug-in equipment</b>, until the requirements of Annexes B.3.1 and B.4 are met</p>		N/A
G.4.2	<p><b>Denmark</b></p> <p>To the end of the subclause the following is added: Supply cords of single phase appliances having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1:2011. 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 a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2. Mains socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance DS 60884-2-D1:2011 standard sheet DKA 1-4a. Other current rating socket outlets shall be in compliance with Standard Sheet DKA 1-3a or DKA 1-1c. Mains socket-outlets with earth shall be in compliance with DS 60884-2-D1:2011 Standard Sheet DK 1-3a, DK 1-1c, DK1-1d, DK 1-5a or DK 1-7a <i>Justification:</i> Heavy Current Regulations, Section 6c</p>		N/A
G.4.2	<p><b>United Kingdom</b></p> <p>To the end of the subclause the following is added: 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 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.</p>		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	<b>United Kingdom</b> To the first paragraph the following is added: Equipment 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 shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, 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
G.7.1	<b>Ireland</b> To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard		N/A
G.7.2	<b>Ireland and United Kingdom:</b> To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm <sup>2</sup> is allowed for equipment which is rated over 10 A and up to and including 13 A.		N/A

IEC62368_1B - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
<b>ZC</b>	<b>ANNEX ZC, NATIONAL DEVIATIONS (EN)</b>		N/A
10.5.2	<b>Germany</b> The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. <i>Justification:</i> German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. <b>NOTE</b> Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int +49-531-592-6320, Internet: <a href="http://www.ptb.de">http://www.ptb.de</a>		N/A

**ATTACHMENT TO TEST REPORT IEC 62368-1**  
**Pictures of the EUT**



**NB1800, total view**



**Interfaces of NB1800 (power, serial and LAN)**



**Rear view of NB1800 (DIN rail mounting), antenna connectors on the right**

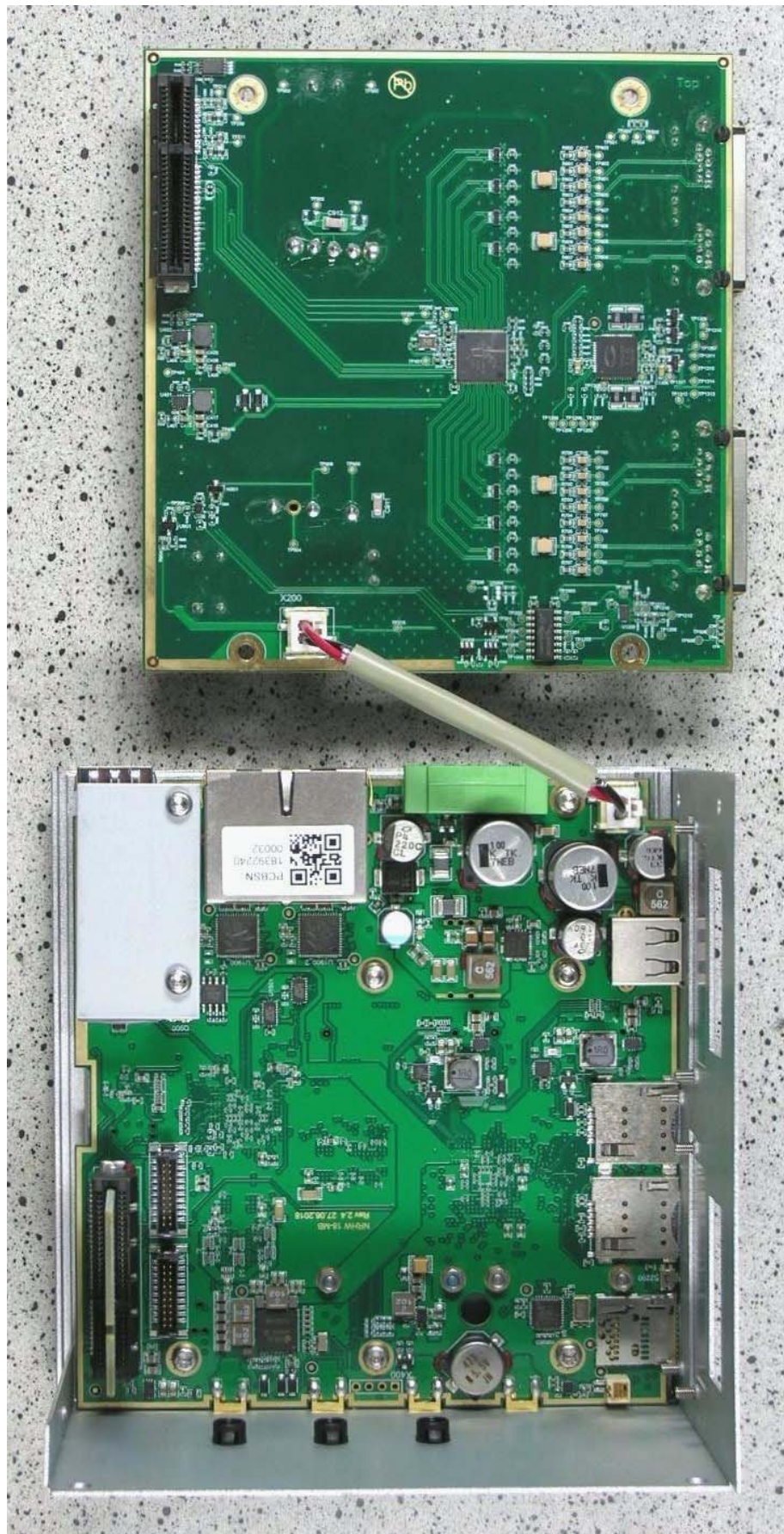
**NB1810, total view**



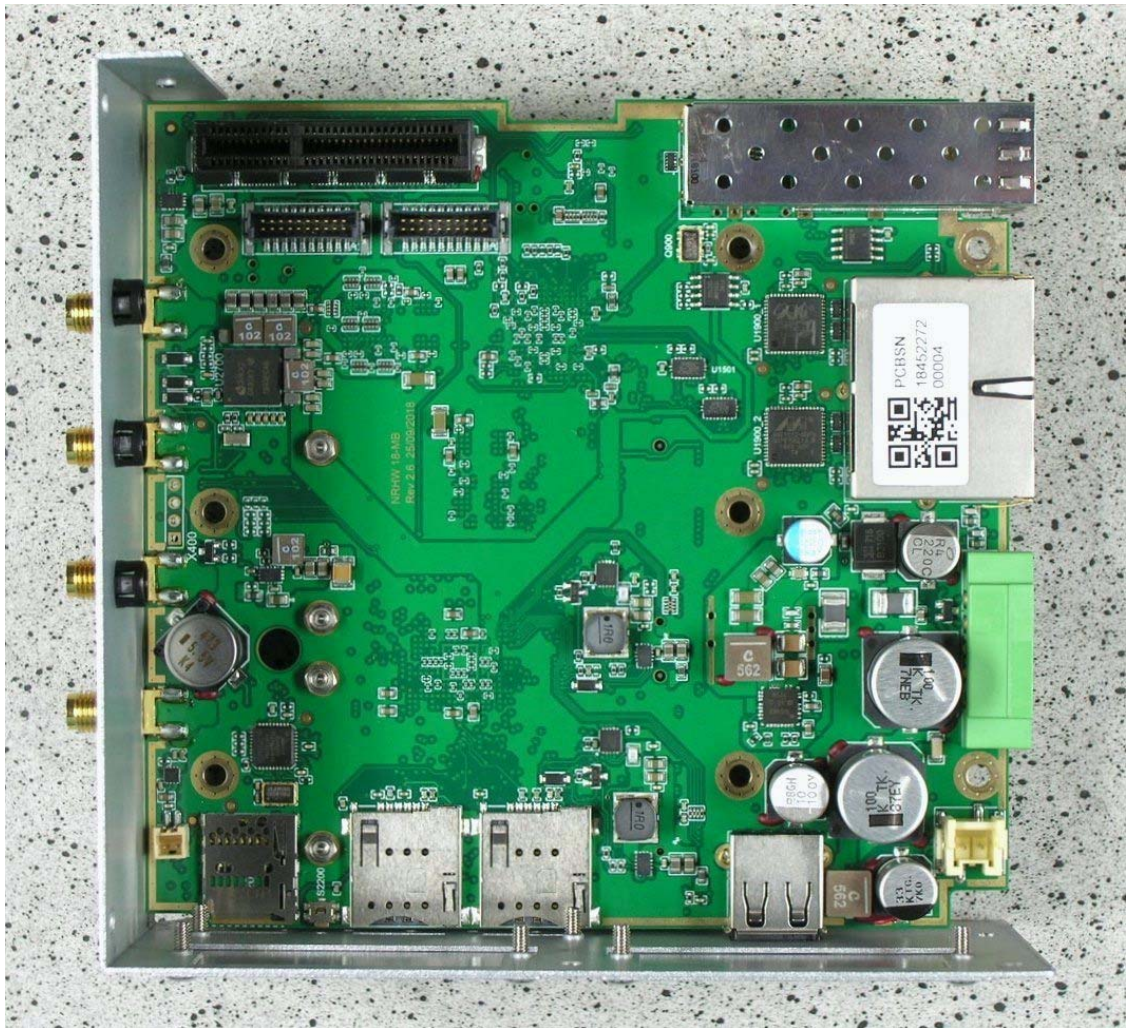
**Interfaces of NB1810 (power, serial and LAN)**



**Rear view of NB1810 (DIN rail mounting), antenna connectors on the right**

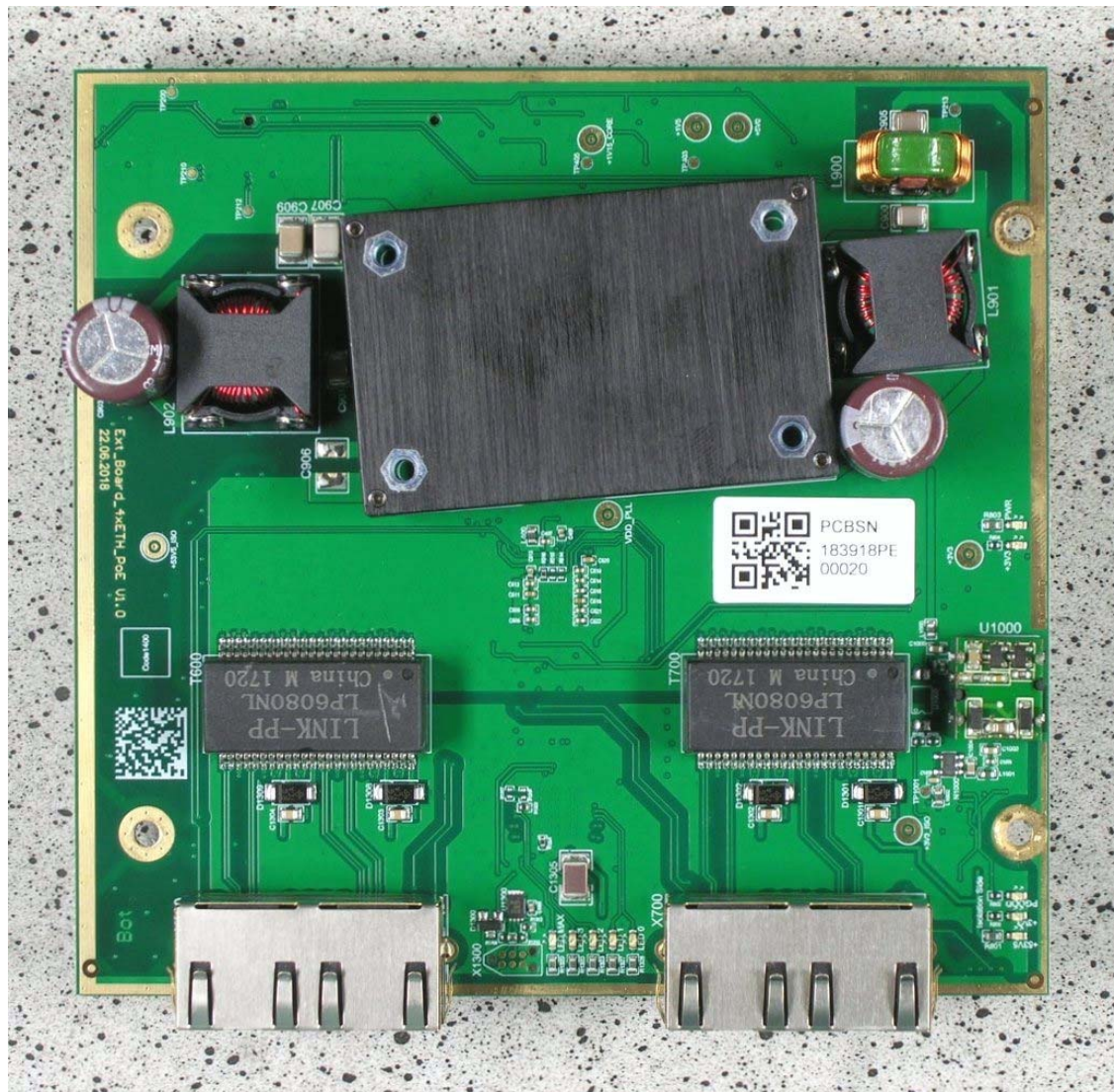


**Enclosure of NB1810 removed, power connection between Mainboard and PoE Board**

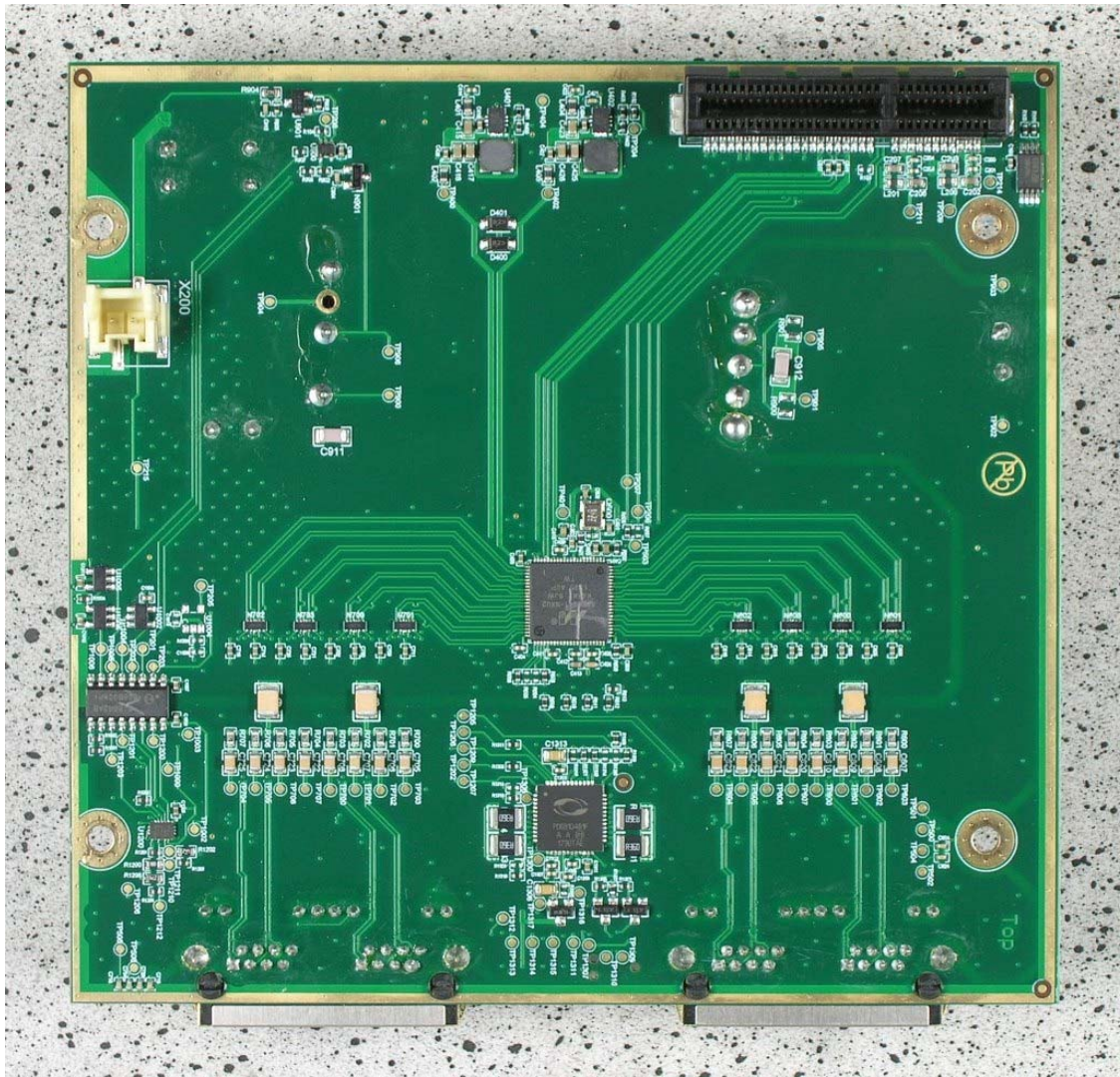


**Enclosure of NB1800 removed, top view of Mainboard  
(same Mainboard used for NB1810)**





PoE Board V2.0, top view (erroneously wrong labelled with V1.0)



PoE Board, bottom view