CONFORMITY INVESTIGATION

HPI

for the purpose of CE marking

Type Investigation	Project number	Compiled by	Signature	Reviewed by	Signature	Date of release	Revision	
							Version number	Date
Conformity Investigation	2021/1219	Grigorios Andriolas		David Rubio Borrajo		18-08-22	3	13.10.2023

INVESTIGATION REQUESTED BY

Company	DHL Supply Chain (Netherlands) B.V.
Address	Anderlechtstraat 15 5628 WB Eindhoven
Country	The Netherlands
Phone number	+31 (0) 40 21 55 700
Company representative(s)	Mr. Henk Brinkman

INVESTIGATION CONDUCTED BY

Company	Certification Company B.V.
Address	Veluwezoom 42 1327AH Almere
Country	The Netherlands
Phone number	+31 (0)36 202 40 12
Subject	Conformity investigation HPI for the purpose of CE marking
Project number	2021-1219
Pages	88
Annexes	5

LEGAL NOTICE

Liability

Certification Company cannot be held liable for (in)direct, incidental or consequential damages, including lost profits or work stoppages arising from the consultation or use of the contents of this report if it is based on a clerical or typographical error or if the Applicant has provided Certification Company incomplete and/or incorrect information, directly, indirectly or in any way whatsoever. The same provision applies if the delivered product samples are not of the same quality or to what extent therefore differ from the final product, or if the production in any way different from what is indicated to Certification Company.

Confidentiality

Information depicted from this report is strictly confidential and only intended for the Applicant. Disclosure, reproduction and / or provision of (any part of) is not permitted to third parties without the written consent of Certification Company. Certification Company gives permission to display portions of the content from the different parts of this report internally for internal non-commercial uses.

Intellectual property

The content of this report is protected by the Copyright Act 1912, provisions of international treaties and all other applicable national laws. All intellectual property rights concerning the texts, images, graphics, logos, sounds, and other materials in this report are owned by Certification Company and / or their dependents. Certification Company is a registered trademark. With exception of written consent, the Applicant does not have a license nor right, to use any of the trademarks of the Certification Company or its corporate logo.

Terms and conditions

In addition to the terms as stipulated, the general Terms and Conditions of Certification Company are fully in force for this report. By accepting this report the Applicant explicitly endorses with these Terms and Conditions. A digital copy of the general Terms and Conditions will be provided free of charge at the written request of the Applicant.

TABLE OF CONTENTS

1. INTRODUCTION

1.1 PURPOSE OF THE REPORT

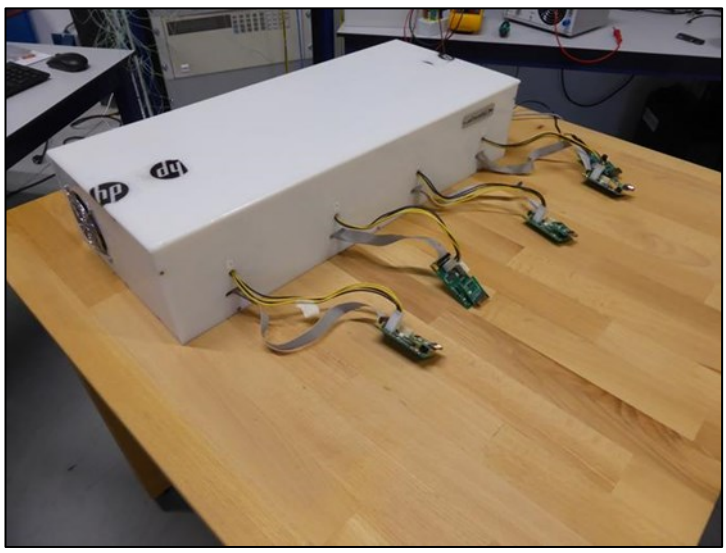
This report was commissioned by DHL Supply Chain (Netherlands) B.V. (**'the Applicant'**) and compiled by Certification Company. The purpose of this report is to establish a presumption of conformity with the investigated Product of the Applicant with the following European Directives:

- Directive 2014/35/EU relating to the making available on the market of electrical equipment designed for use within certain voltage limits ('**Low Voltage Directive'** or **'LVD'**)
- Directive 2014/30/EU on the harmonisation of the laws of the Member States relating to electromagnetic compatibility ('**EMC Directive**' or '**EMC**')
- Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (**'RoHS Directive'** or '**RoHS**')

This chapter deals with identification of the Product (§ 1.2), the legal classification of the Product (§ 1.3) and the legal classification of the Applicant as an economic operator (§ 1.4).

1.2 PRODUCT IDENTIFICATION

For the purpose of this investigation the following Product has been taken into account:

#	PRODUCT NAME	INTENDED USE	PHOTOGRAPHIC EXAMPLE
1	HPI	Battery charger	

Remark 1: The above-mentioned Product(s) are further referred to as **'the Product'**. See **Annex I** for additional pictures.

1.3 PRODUCT CLASSIFICATION

The Product is primarily classified as an **electrical equipment** in accordance with the European Low Voltage Directive. According to article 1 of the European Low Voltage Directive electrical equipment means:

> *"a product which has been designed for use with a voltage rating of between 50 and 1 000 V for alternating current and between 75 and 1 500 V for direct current"*

- **Justification:** The product is designed for alternating current between 50 and 1000 V. Therefore, the Product is considered as electrical equipment and falls within the scope of the above mentioned applicable European Legislation.

Remark: Besides the Low Voltage Directive, the Product also falls under the scope of the EMC and RoHS Directives, which means the Product has to conform to the relevant standards of those Directives as well.

1.4 ECONOMIC OPERATOR CLASSIFICATION

According to article 2, paragraph 7 of the Low Voltage Directive, there are four economic operators: the manufacturer, the authorized representative, the importer and the distributor.

The Applicant is classified as the **Manufacturer** in accordance with the European Low Voltage Directive. According to article 2, paragraph 3 of the Low Voltage Directive, a manufacturer means:

> *"any natural or legal person who manufactures electrical equipment or has electrical equipment designed or manufactured, and markets that equipment under his name or trade mark"*

- **Justification:** The Applicant is a legal person who has the electrical equipment designed and/or manufactured and wants to market that equipment under his name or trade mark. Therefore, the Applicant must be considered as the manufacturer of the electrical equipment within the scope of Low Voltage Directive.

Remark: Certification Company has established that the provided documentation has been drafted under a different trade name, TeraSci. The Applicant shall ensure to modify the user manual and affix the appropriate type plate including his own trade name should he ultimately wants to market the Product under his own trade name. In any other case, the Applicant shall ensure to indicate who is the legal manufacturer of the Product as described in sub-chapter 1.2.

1.5 AVAILABLE COMPLIANCE DOCUMENTATION

#	DOCUMENT NAME	DOCUMENT TYPE	INTERNAL REFERENCE NUMBER
1	TeraSci HPI Battery Process Work Instruction	User Manual	TD-03-01
2	HPI	Schematics	TD-02-01
3	TeraSci Battery Maintenance System	Maintenance Manual	TD-03-02
4	Battery BOM	BOM	TD-01-17

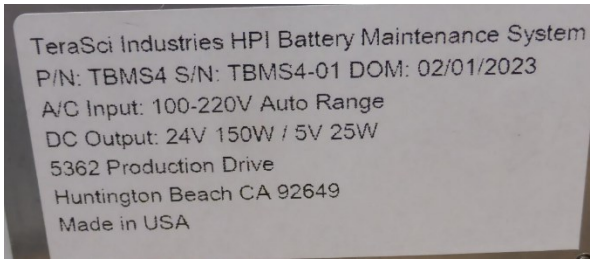
Remark: the documentation made available and the results and / or conclusions resulting therefrom are assumed to be authentic. The internal reference numbers mentioned above will be used throughout this report as part of compliance evidence.

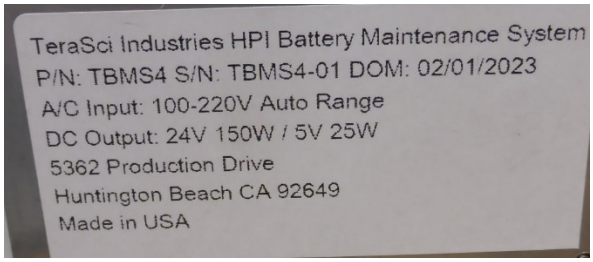
2. CONFORMITY PROCEDURE MANUFACTURER

The applicable Directives require the Applicant to comply with specific legal obligations. Certification Company has mapped out and independently assessed these obligations. An overview of the obligations as well as the results are set out below.

CONFORMITY PROCEDURE ASSESSMENT CHECKLIST (In accordance with article 6 Low Voltage Directive; article 7 EMC Directive and article 7 RoHS Directive)		
OBLIGATIONS	**LEGAL BASIS**	**ASSESSMENT**
OBLIGATIONS MANUFACTURER		
1) When placing their electrical equipment on the market, manufacturers shall ensure that it has been designed and manufactured in accordance with the established safety requirements.	Article 6, section 1, Low Voltage Directive ~ Article 7, section 1, EMC Directive ~ Article 7, sub a, RoHS Directive	**IN COMPLIANCE** **LVD/EMC** **Compliance with the relevant safety requirements will be determined by means of electrical safety tests and EMC measurements. Please refer to Chapter 3 and Annexes II and III for test results.** **RoHS** **Compliance with the relevant safety requirements will be determined by means of documentation. Please refer to Chapter 3 and Annex IV for further details.**
2) Manufacturers shall draw up technical documentation and carry out the conformity assessment procedure or have it carried out.	Article 6, section 2, first paragraph, Low Voltage Directive ~ Article 7, section 2, first paragraph, EMC Directive ~ Article 7, sub b, RoHS Directive	**IN COMPLIANCE** **Certification Company has reviewed the Technical Documentation provided by the Applicant. The results of the assessment are in Chapter 4 of this expertise report.**

CONFORMITY PROCEDURE ASSESSMENT CHECKLIST (In accordance with article 6 Low Voltage Directive; article 7 EMC Directive and article 7 RoHS Directive)		
OBLIGATIONS	**LEGAL BASIS**	**ASSESSMENT**
3) When it has been determined that the electrical equipment meets the stated safety requirements, manufacturers shall issue an EU Declaration of Conformity and affix the CE marking.	Article 6, section 2, second paragraph, Low Voltage Directive ~ Article 7, section 2, second paragraph, EMC Directive ~ Article 7, sub c, RoHS Directive	**IN COMPLIANCE** **Certification Company shall draw up the EU Declaration of Conformity once the conformity procedure is in compliance.** Remark: For rules on how to affix the CE marking, please refer to **Annex V**.
4) Manufacturers shall keep the technical documentation and the EU Declaration of Conformity for 10 years after the electrical equipment has been placed on the market.	Article 6, section 3, Low Voltage Directive ~ Article 7, section 3, EMC Directive ~ Article 7, sub d, RoHS Directive	**INFORMATION REQUIREMENT** Certification Company has informed the Applicant about his responsibility to keep the Technical Documentation as well as the EU declaration of conformity for a period of 10 years after the Product has been placed on the market.
5) Manufacturers shall ensure that procedures to ensure compliance are in place for series production.	Article 6, section 4, first paragraph, Low Voltage Directive ~ Article 7, section 4, first paragraph, EMC Directive ~ Article 7, sub e, RoHS Directive	**INFORMATION REQUIREMENT** **Remark:** an ISO 9001 (Quality Management System) certificate or another certified quality system with a relevant scope is advisable to be obtained.

CONFORMITY PROCEDURE ASSESSMENT CHECKLIST (In accordance with article 6 Low Voltage Directive; article 7 EMC Directive and article 7 RoHS Directive)		
OBLIGATIONS	**LEGAL BASIS**	**ASSESSMENT**
6) When deemed appropriate with regard to the risks presented by the electrical equipment, manufacturers shall, to protect the health and safety of consumers, carry out sample testing of electrical equipment made available on the market, investigate, and, if necessary, keep a register of complaints, of non-conforming electrical equipment and electrical equipment recalls, and shall keep distributors informed of any such monitoring.	Article 6, section 4, second paragraph, Low Voltage Directive ~ Article 7, section 4, second paragraph, EMC Directive ~ Article 7, sub f, RoHS Directive	**INFORMATION REQUIREMENT** Certification Company has informed the Applicant of his responsibility to carry out random checks, to investigate complaints about non-compliant or recalled Products and to keep a register of these actions.
7) Manufacturers shall ensure that electrical equipment which they have placed on the market bears a type, batch or serial number or other element allowing its identification, or, where the size or nature of the electrical equipment does not allow it, that the required information is provided on its packaging or in a document accompanying the electrical equipment.	Article 6, section 5, Low Voltage Directive ~ Article 7, section 5, EMC Directive ~ Article 7, sub g, RoHS Directive	**IN COMPLIANCE** **Certification Company has established that the Product does bear a type.** 

CONFORMITY PROCEDURE ASSESSMENT CHECKLIST (In accordance with article 6 Low Voltage Directive; article 7 EMC Directive and article 7 RoHS Directive)		
OBLIGATIONS	**LEGAL BASIS**	**ASSESSMENT**
8) Manufacturers shall indicate on the electrical equipment their name, registered trade name or registered trade mark and the postal address at which they can be contacted or, where that is not possible, on its packaging or in a document accompanying the electrical equipment. The address shall indicate a single point at which the manufacturer can be contacted. The contact details shall be in a language easily understood by end-users and market surveillance authorities.	Article 6, section 6, Low Voltage Directive ~ Article 7, section 6, EMC Directive ~ Article 7, sub h, RoHS Directive	**IN COMPLIANCE** **Certification Company has established that the registered trade name and the postal address present on the label.** 
9) Manufacturers shall ensure that the electrical equipment is accompanied by instructions and safety information in a language which can be easily understood by consumers and other end-users, as determined by the Member State concerned. Such instructions and safety information, as well as any labelling, shall be clear, understandable and intelligible.	Article 6, section 7, Low Voltage Directive ~ Article 7, section 7, EMC Directive	**IN COMPLIANCE** **Please refer to Chapter 5 for the assessment of the instructions for use provided by the Applicant.** **Intern.ref.:** TD-03-01

CONFORMITY PROCEDURE ASSESSMENT CHECKLIST (In accordance with article 6 Low Voltage Directive; article 7 EMC Directive and article 7 RoHS Directive)		
OBLIGATIONS	**LEGAL BASIS**	**ASSESSMENT**
10) Manufacturers who consider or have reason to believe that electrical equipment which they have placed on the market is not in conformity with this Directive shall immediately take the corrective measures necessary to bring that electrical equipment into conformity, to withdraw it or recall it, if appropriate. Furthermore, where the electrical equipment presents a risk, manufacturers shall immediately inform the competent national authorities of the Member States in which they made the electrical equipment available on the market to that effect, giving details, in particular, of the non-compliance and of any corrective measures taken.	Article 6, section 8, Low Voltage Directive ~ Article 7, section 8, EMC Directive ~ Article 7, sub i, RoHS Directive	**INFORMATION REQUIREMENT** Certification Company has informed the Applicant of his responsibility to take corrective measures and to inform the competent national authorities if the Product is at risk. **Remark**: At the request of the Applicant, Certification Company can act as authorized representative and take corrective measures on behalf of the Applicant and inform the competent national authorities.
11) Manufacturers shall, further to a reasoned request from a competent national authority, provide it with all the information and documentation in paper or electronic form necessary to demonstrate the conformity of the electrical equipment with this Directive, in a language which can be easily understood by that authority. They shall cooperate with that authority, at its request, on any action taken to eliminate the risks posed by electrical equipment which they have placed on the market.	Article 6, section 9, Low Voltage Directive ~ Article 7, section 9, EMC Directive ~ Article 7, sub j, RoHS Directive	**INFORMATION REQUIREMENT** Certification Company has informed the Applicant of his responsibility to cooperate with the competent national authorities.

***** END CHECKLIST *****

3. ESSENTIAL SAFETY REQUIREMENTS

The applicable EU Directives obligate the Applicant to ensure that their products comply to the essential safety requirements. Certification Company has mapped out and independently assessed the essential requirements on the basis of relevant European harmonised standards. An overview of the essential safety requirements as well the results are set out below.

3.1 ASSESSMENT OF ESSENTIAL SAFETY REQUIREMENTS (LVD)

LVD ESSENTIAL REQUIREMENTS CHECKLIST (In accordance with Article 6(1) and Annex I of the LVD Directive)		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
1) Electrical equipment shall be constructed in accordance with good engineering practice in safety matters, shall not endanger the health and safety of persons and domestic animals, or property, when properly installed and maintained and used in applications for which it was designed.	Article 6(1) ~ Annex I	**IN COMPLIANCE** **Please refer to Annex II for detailed test results.**

3.2 ASSESSMENT OF ESSENTIAL SAFETY REQUIREMENTS (EMC)

EMC ESSENTIAL REQUIREMENTS CHECKLIST (In accordance with article 7(1) and Annex I of the EMC Directive)		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
1) Manufacturers shall ensure that the equipment is designed and manufactured in compliance with the requirements set out in Annex I.	Article 7(1) ~ Annex I	**IN COMPLIANCE** **Please refer to Annex III for detailed test results.**

3.3 ASSESSMENT OF ESSENTIAL SAFETY REQUIREMENTS (ROHS)

ESSENTIAL REQUIREMENTS (In accordance with article 7 of the RoHS Directive)		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
1) Member States shall ensure that:		
a) when placing EEE on the market, manufacturers ensure that it has been designed and manufactured in accordance with the requirements set out in Article 4;	Article 7, sub a	**IN COMPLIANCE** **The Applicant shall provide Certification Company with relevant RoHS Declarations/statements from the OEMs of the components that consist of the Product. For an overview of the relevant components and the documentation assessment, see Annex IV.**

***** END CHECKLIST *****

4. TECHNICAL DOCUMENTATION

It is responsibility of the Manufacturer to compile the Technical Documentation. The Technical Documentation must be able to assess whether the Product meets the essential safety requirements.

The Technical Documentation consists of the documents listed in the relevant European product safety legislation. An overview of both the requirements and the results is shown in the below table.

TECHNICAL DOCUMENTATION (In accordance with Annex III, Point 2, Low Voltage Directive; Annex II, Point 3, EMC Directive and Annex II, Module A, Point 2, Decision 768/2008/EC)		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
GENERAL REQUIREMENTS		
1) A general description of the electrical equipment.	Annex III, Point 2, Sub a; Low Voltage Directive ~ Annex II, Point 3, Sub a, EMC Directive ~ Annex II, Module A, Point 2, first paragraph, Decision 768/2008/EC	**IN COMPLIANCE** The Applicant has established that a general description of the electrical equipment has been provided. **Intern.ref.: TD-03-04**
2) Conceptual design and manufacturing drawings and schemes of components, sub-assemblies, circuits, etc.	Annex III, Point 2, Sub b; Low Voltage Directive ~ Annex II, Point 3, Sub b, EMC Directive ~ Annex II, Module A, Point 2, second paragraph, Decision 768/2008/EC	**IN COMPLIANCE** The Applicant has provided electrical schematics for the Product and its components. Additional documents such as manufacturing drawings for the complete Product is highly recommended to be added in the Technical File. **Intern.ref.:** TD-02-01

TECHNICAL DOCUMENTATION (In accordance with Annex III, Point 2, Low Voltage Directive; Annex II, Point 3, EMC Directive and Annex II, Module A, Point 2, Decision 768/2008/EC)		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
3) Descriptions and explanations necessary for the understanding of those drawings and schemes and the operation of the electrical equipment.	Annex III, Point 2, Sub c; Low Voltage Directive ~ Annex II, Point 3, Sub c, EMC Directive ~ Annex II, Module A, Point 2, third paragraph, Decision 768/2008/EC	**IN COMPLIANCE** Please check point 2 above.
4) A list of the harmonised standards applied in full or in part and where those standards have not been applied, descriptions of the solutions adopted to meet the safety objectives of the Directives.	Annex III, Point 2, Sub d; Low Voltage Directive ~ Annex II, Point 3, Sub d, EMC Directive ~ Annex II, Module A, Point 2, fourth paragraph, Decision 768/2008/EC	**INFORMATION REQUIREMENT** A list of the standards applied in full or in part will be mentioned on the EU Declaration of Conformity.
5) Results of design calculations made, examinations carried out, etc.	Annex III, Point 2, Sub e; Low Voltage Directive ~ Annex II, Point 3, Sub e, EMC Directive ~ Annex II, Module A, Point 2, fifth paragraph, Decision 768/2008/EC	**IN COMPLIANCE** **See Annex II, III and IV of this report.**

TECHNICAL DOCUMENTATION (In accordance with Annex III, Point 2, Low Voltage Directive; Annex II, Point 3, EMC Directive and Annex II, Module A, Point 2, Decision 768/2008/EC)		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
6) Test reports	Annex III, Point 2, Sub f; Low Voltage Directive ~ Annex II, Point 3, Sub f, EMC Directive ~ Annex II, Module A, Point 2, sixth paragraph, Decision 768/2008/EC	**IN COMPLIANCE** **See Annex II, III and IV of this report.**

***** END CHECKLIST *****

5. INSTRUCTIONS FOR USE / SAFETY INSTRUCTIONS

Pursuant to the relevant European product safety legislation manufacturers shall ensure that the electrical equipment is accompanied by instructions and safety information. Certification Company has independently assessed the Work Instructions manual provided by the Applicant (intern.ref.:**TD-03-01**). The assessment was based on the standard IEC 82079 *"Preparation of instructions for use"*. An overview of both the requirements and the results can be found in the below table.

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
IDENTIFICATION		
1) Brand and type designation	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
2) No. of model, version, type, subgroup	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
3) Expiry date	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
4) Up-to-date check / for example date of publication of the handbook, coverage of product modifications	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
5) Supplier and provider of special tools, material, etc. and technical assistance	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
6) Contact details of supplier/service agency	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
7) Certification references	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
8) Requirements of specific product standards	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
TECHNICAL SPECIFICATION OF THE PRODUCT AND ITS RESIDUAL HAZARDS		
9) Functions and range of application	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
10) Safe and correct use; principal residual hazards, general warnings about product or use	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
11) Dimensions — mass — capacity	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
12) Chemical composition	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
13) Performance data	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
14) Supply data for power, gas, water and other consumables (for example detergents, lubricants)	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
15) Energy consumption and methods of measurement used.	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
16) Emission of noise, waste, water, etc., with the methods of measurement used	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
17) Expected product life and intended disposal	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
18) Information on personal protection (for example clothing)	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
19) Information on dangers to particular vulnerable groups (for example potential allergy or strobe effects)	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
PREPARING THE PRODUCT FOR USE		
20) Safety precautions before installation	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
21) Unpacking instructions	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE** No unpacking instructions are included in the IFU manual.
22) Safe disposal of packaging	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
23) Installation and assembly (for example special tools, space for maintenance and repair)	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
24) Storage and protection during intervals in normal use	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
25) Repackaging to prevent damage in transport	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
26) Information on operations to be carried out only by skilled persons. Separation of this information from instructions for use to users. Comprehensiveness of instructions for use to experts.	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
OPERATION OF PRODUCTS		
27) Basic functions: – Complete for correct intended use – Complete for safe intended use – Complete for reasonably foreseeable misuse – Conformity with minimum list in relevant product standard(s)	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
28) Secondary functions	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE** The Product has no secondary functions.
29) Optional modules and extras	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
30) Personal protection	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
31) Quick references – by reminder cards, stickers or labels – by reference to handbook, etc.	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
32) Disposal of waste products	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
INFORMATION NEEDED BY USER		
33) Explanations of visible and audible signals	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE** The provided user manual contains explanations of the visible signals.
34) Distinctions between characteristics of normal and faulty/dangerous operation	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
35) Trouble-shooting advice (for example in the form of Frequently Asked Questions and fault detection procedures) – intelligible to consumers and paying due regard to safety	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
MAINTENANCE OF THE PRODUCT		
36) Safety precautions (for example personal protection, special tools)	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
37) Product maintenance by non-skilled persons	Annex B, Table B.1, IEC 82079	**IN COMPLAINCE**
38) Product maintenance by skilled persons	Annex B, Table B.1, IEC 82079	**IN COMPLAINCE**
39) Safety/deterioration checks during maintenance	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
CRITICAL SAFETY AND HEALTH INFORMATION		
40) Warning messages: – correct locations • on product and/or • on packaging and/or • in instructions for use – if relevant, visibility at point of sale – correct use of terms – correct use of signal words – use of simple /standardized phrases – durability of warnings – conformity with requirements in relevant product standard(s)	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE** Warning messages are included in the Operations manuals.
41) Safety signals	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
42) Information on residual risk	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
43) Safe disposal of product at the end of its useful life	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
44) Environmental impacts of using the product	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
CONSISTENCY IN DESIGN OF INFORMATION AND OF THE WHOLE 'PRODUCT' OFFERED		
45) Integrated design of product and instructions for use – No compensation for design deficiencies	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
46) Consistent terminology on the product itself; on the packaging; in accompanying material, on Web site resources and in marketing media	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
47) Structure of text and graphics – structure follows communication principles – meaningful headings used – unnecessary material excluded to avoid information overload	Annex B, Table B.1, IEC 82079	**IN COMPLIANCE**
48) Location(s) and presentation of instructions for use	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE**
49) Numbered pages and/or paragraphs, with table of contents and/or index appropriate to length and complexity of text. Use of keywords	Annex B, Table B.1, IEC 82079	**NOT APPLICABLE** The pages are not numbered.
TARGET GROUPS		
50) Target group/s specified	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
51) Instructions for use adequately presented for target Group/s	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
LOCATION AND MEDIUM		
52) Placement on product, on packaging or in accompanying media meets needs of availability and durability	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
53) Alerting function is appropriate to user's needs (prominence/ visibility distance, etc)	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
54) Place in order or sequence with respect to other information following communication principles	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
55) Grouped under appropriate heading and found in index	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
56) Instructions for use and supporting media available on supplier's Web site to users with a wide range of individual access needs	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
LEGIBILITY OF TEXT		
57) Clear typeface and adequate font size (depending on reading distance)	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
58) Line length and line spacing	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
59) Contrast with background	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
60) Effective use of white space	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
61) Durability of legibility of on-product (or on-packaging) text	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
WORDING AND STRUCTURE OF TEXT		
62) Text/use of words - words and phrases not complicated or over-sophisticated - short phrases - one sentence-one command. Not too much information in one sentence - direct active voice and assertive commands	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
63) Terms used for features and user actions - terms familiar to consumers used if possible - technical features and terms well explained - consistent use of terms	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
64) Communication principles - encouraging quick reactions (for example simple and easy information for an emergency) - setting out learning process for complex functions -answering the questions WHERE? WHO? WHAT? WHEN? HOW? WHY?	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
MULTIPLE LANGUAGE VARIANTS		
65) Clear differentiation/ identification of languages	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
66) Each language version checked by a native speaker for comprehensibility and absence of linguistic errors	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
ILLUSTRATIONS		
67) Clarity of features and actions illustrated at intended viewing distance (lack of ambiguity; self-explanatory without text whenever possible)	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
68) Sufficient number of illustrations for each one to provide clear and specific information	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
69) Illustrations supported by clear and helpful captions	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
70) Clear connections or cross-references between text and illustrations	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
71) Can be viewed adjacent to relevant text when necessary	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
72) Repeated illustrations where necessary	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
USE OF GRAPHICAL SYMBOLS		
73) Adequate size to be comprehensible at intended viewing distance	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
74) Standardized symbols used where possible (in standard colours)	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
75) Standard design principles (for example shape and colour) followed for any new symbols	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
76) Each symbol clearly explained in text	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
77) Durability of on-product (or on-packaging) symbols	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
TABLES, CONCEPTUAL DIAGRAMS AND FLOW CHARTS		
78) Provided and located where appropriate	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
79) Clearly set out and informative	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
80) Repeated tables, diagrams and flow charts where necessary	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
USE OF COLOURS		
81) Functional	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
82) Clear and easily distinguishable	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
83) Consistent	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
EXPLANATION OF VISUAL AND AUDIBLE SIGNALS		
84) Clarity of information provided to users	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
85) Lights, sounds, text displays (or other indications) that may be given by the product at each stage are explained and referred to at each relevant point in the text	Annex C, Table C.1, IEC 82079	**IN COMPLIANCE**
INSTRUCTIONS FOR USE OF ELECTRONIC MEDIA		
86) Indicate whether supplementing or replacing instructions for use in text	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
87) Follow structure and language of text except when this is unsuitable to medium	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**
88) Offer multi-lingual and text/audio options	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**

INSTRUCTIONS FOR USE (In accordance with NEN-EN-IEC 82079-1 "Preparation of instructions of use")		
REQUIREMENTS	**LEGAL BASIS**	**ASSESSMENT**
DURABILITY		
89) Those items of instructions for use that need to be kept for reference or new users should be in media that offer adequate provision against loss or deterioration in expected (normal) life of product and discouragement of their disposal.	Annex C, Table C.1, IEC 82079	**NOT APPLICABLE**

***** END CHECKLIST *****

6. CONCLUSION

Certification Company carried out a conformity assessment on behalf of DHL Supply Chain (Netherlands) B.V. with the purpose of establishing conformity with the investigated Product and in accordance with the following Directives:

- Directive 2014/35/EU relating to the making available on the market of electrical equipment designed for use within certain voltage limits ('**Low Voltage Directive'** or **'LVD'**)

- Directive 2014/30/EU on the harmonisation of the laws of the Member States relating to electromagnetic compatibility ('**EMC Directive**' or '**EMC**')

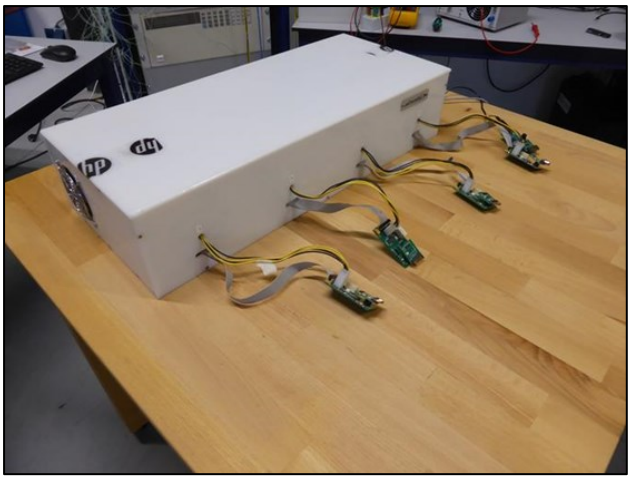
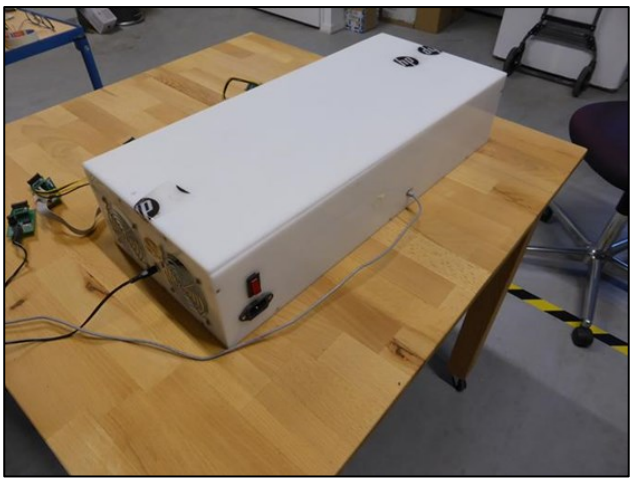
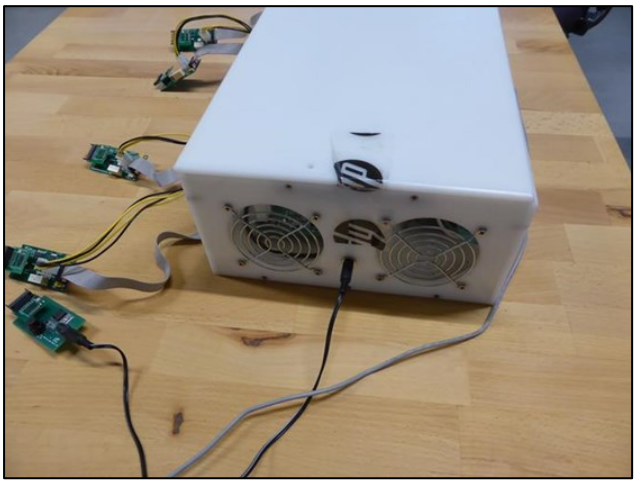
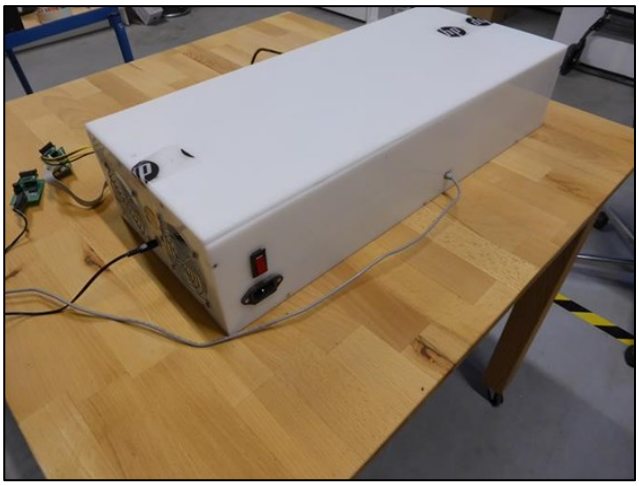
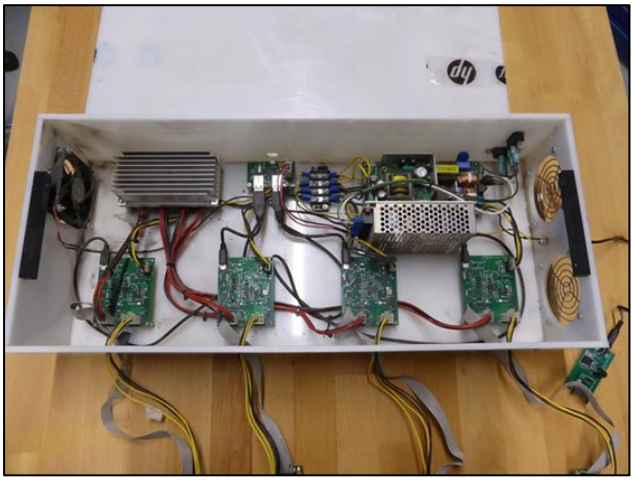
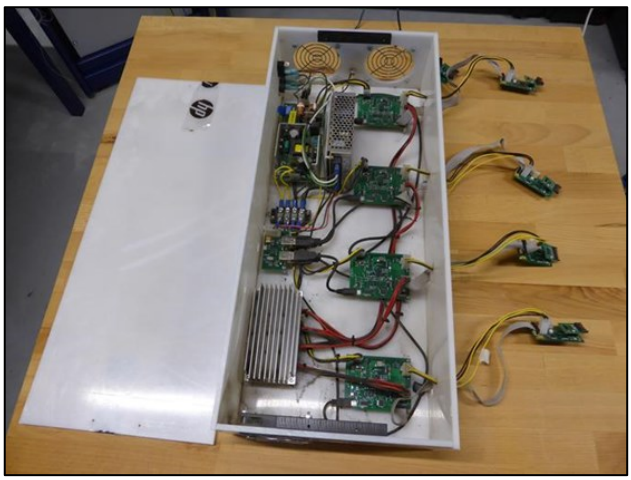
- Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (**'RoHS Directive'** or '**RoHS**')

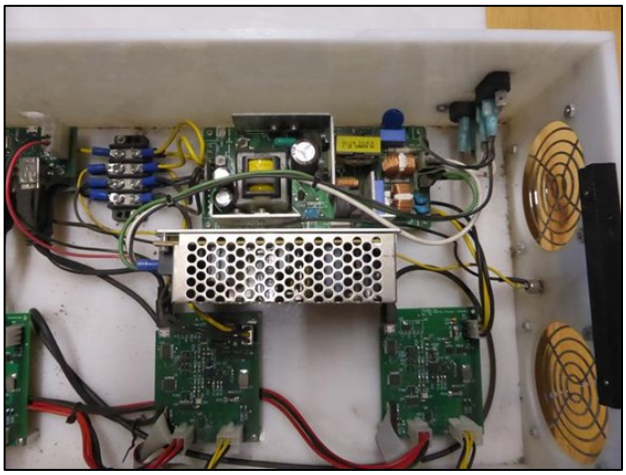
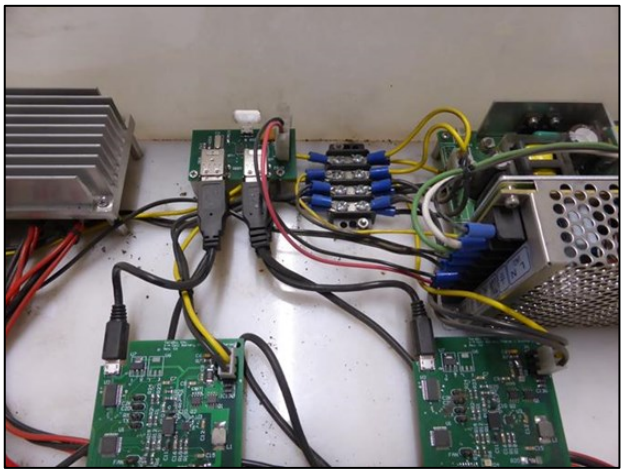
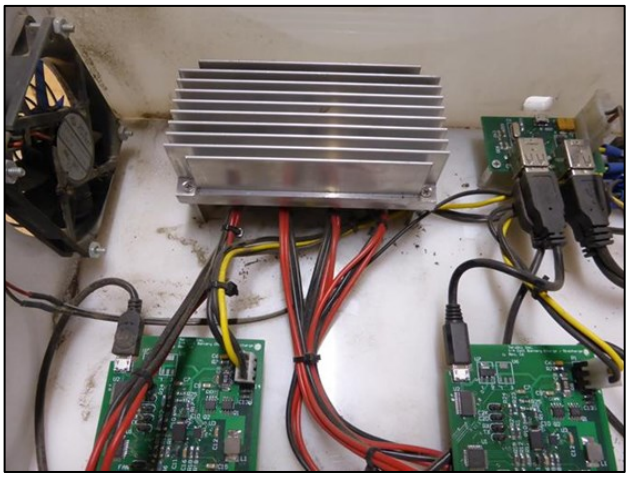
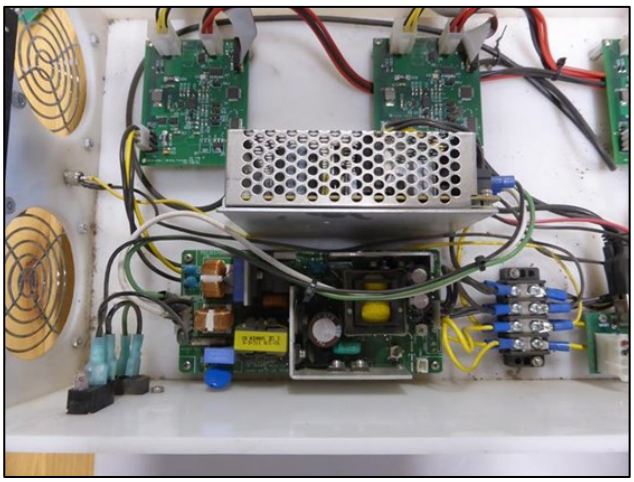
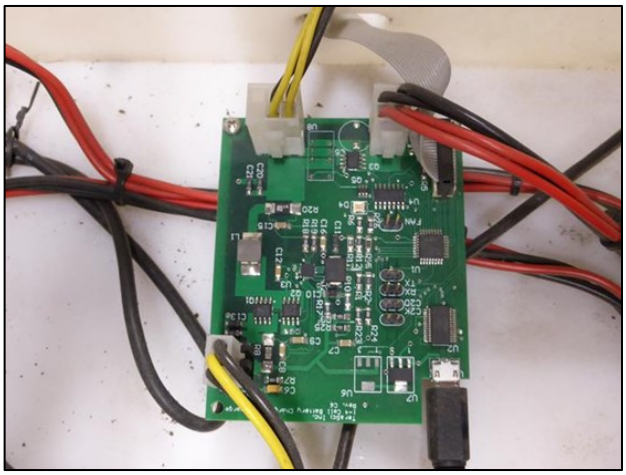
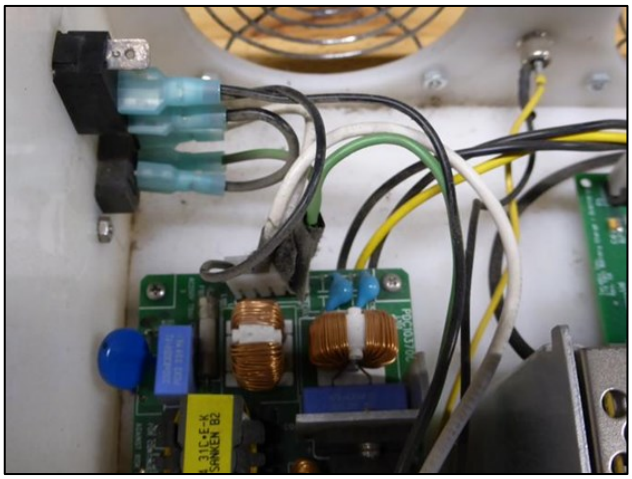
#	REQUIREMENT	ASSESSMENT	REMARKS
1	CONFORMITY PROCEDURE MANUFACTURER	IN COMPLIANCE	See Chapter 2 for remarks.
2	ESSENTIAL SAFETY REQUIREMENTS LVD	IN COMPLIANCE	See Annex II for remarks.
3	ESSENTIAL SAFETY REQUIREMENTS EMC	IN COMPLIANCE	See Annex III for remarks.
4	ESSENTIAL SAFETY REQUIREMENTS RoHS	IN COMPLIANCE	See Annex IV for remarks.
5	TECHNICAL DOCUMENTATION	IN COMPLIANCE	See Chapter 4 for remarks.
6	INSTRUCTIONS FOR USE	IN COMPLIANCE	See Chapter 5 for remarks.
FINAL CONCLUSION CE CONFORMITY			IN COMPLIANCE

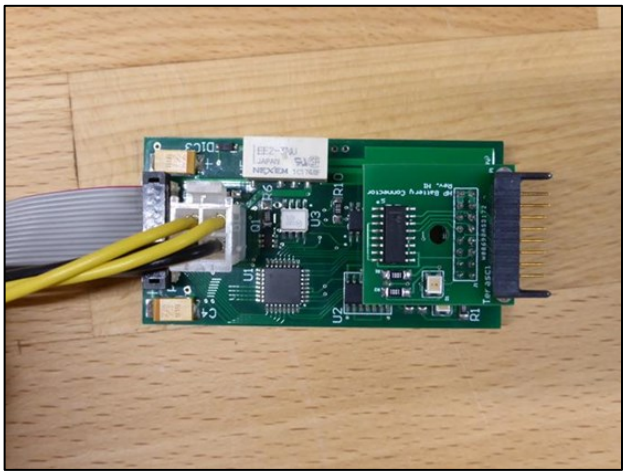
The Applicant is requested to address the under-assessment points within **30 days** after this report has been released in order to establish compliance with the applicable legislation.

Almere, the Netherlands
18 August 2022
Rev. 7 September 2023
Rev. 13 October 2023

ANNEX I PRODUCT PICTURES



ANNEX II TEST REPORT LOW VOLTAGE DIRECTIVE

Certification Company BV carried out an electrical safety evaluation on the HPI battery charge system within the scope of the CE marking process. This report is only to be used for this purpose.

The electrical safety evaluation is carried out in order to find out whether the product complies with the harmonised electric safety standards under the low voltage directive 2014/35/EU.

In this report, the product tested will be referred to as Equipment Under Test (EUT). All relevant tests and measurements as described in the applicable standard(s), listed in 1.1, are carried out, unless specified in this report.

The test results presented in this report relate only to the product which is tested.

1.1 STANDARD(S)

The EUT is tested against the following standard(s):

- EN62368-1:2014 – Audio/Video, information and communication technology equipment – Part 1: Safety requirements

1.2 ABBREVIATIONS

Abbr.	Description
EUT	Equipment Under Test
LPS	Limited Power Source
SFC	Single Fault Condition
SELV	Safety Extra Low Voltage

2 TEST ITEM PARTICULARS

Classification of use by ..... :	☐ Ordinary person ☒ Instructed person ☐ Skilled person ☐ Children likely to be present
Supply Connection ..... :	☒ AC Mains ☐ DC Mains ☐ External Circuit - not Mains connected - ☐ ES1 ☐ ES2 ☐ ES3
Supply % Tolerance ..... :	☒ +10%/-10% ☐ +20%/-15% ☐ +____%/ -_____% ☐ None
Supply Connection – Type ..... :	☒ pluggable equipment type A - ☐ non-detachable supply cord ☒ appliance coupler ☐ direct plug-in ☐ mating connector ☐ pluggable equipment type B - ☐ non-detachable supply cord ☐ appliance coupler ☐ permanent connection ☐ mating connector ☐ other
Considered current rating of protective device as part of building or equipment installation..... :	16A; Installation location: ☒ building; ☐ equipment
Equipment mobility ..... :	☒ movable ☐ hand-held ☐ transportable ☐ stationary ☐ for building-in ☐ direct plug-in ☐ rack-mounting ☐ wall-mounted
Over voltage category (OVC)[1] ..... :	☐ OVC I ☒ OVC II ☐ OVC III ☐ OVC IV ☐ other: _____
Class of equipment ..... :	☒ Class I ☐ Class II ☐ Class III
Access location ..... :	☐ restricted access location ☒ N/A
Pollution degree (PD) ..... :	☐ PD 1 ☒ PD 2 ☐ PD 3
Manufacturer's specified maximum operating ambient..... :	+40°C
IP protection class ..... :	☐ IPX0 ☐ IP65
Power Systems ..... :	☐ TN ☐ TT ☐ IT - ____ V_{L-L}
Altitude during operation (m) ..... :	☒ 2000 m or less ☐ _____ m
Altitude of test laboratory (m) ..... :	☒ 2000 m or less ☐ _____ m
Mass of equipment (kg) ..... :	☒ 5.1

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.** This Test Report covers test results for IEC 62368-1: 2014 (Second Edition), and additional results for IEC 60065: 2014 (Eighth Edition) and/or IEC 60950-1: 2005 (Second Edition) + Am 1: 2009 + Am 2: 2013. Where a requirement in IEC 62368-1 addresses the same requirement/principle in IEC 60065 and/or IEC 60950-1, compliance with the IEC 62368-1 requirements covers compliance with the same requirement/principle in IEC 60065 and/or IEC 6095-1, as indicated. The complete background/rationale behind the considerations in this TRF is outlined in **108/575/INF,** *IEC TC 108 position related to TRFs associated with the transition of IEC 60065 and IEC 60950-1 to IEC 62368-1.* Use of this TRF is intended to allow for a smooth transition from the legacy standards, IEC 60065 and IEC 60950-1, to the state-of-art requirements for safety of audio/video, information and communication technology equipment, IEC 62368-1.
GENERAL PRODUCT INFORMATION:
Product Description: The EUT can charge or discharge up to 4 batteries, it is connected to 230Vac mains and a PC. On the PC the charge/discharge is activated and can be monitored.
Model Differences: -
Additional application considerations – (Considerations used to test a component or sub-assembly) See chapter 4.1, conditions of use.

Applicant's name……..…..:	DHL Supply Chain (Netherlands) B.V.
Address……..……..:	Anderlechtstraat 15 5628 WB Eindhoven

3 CONCLUSION

- The performed tests according the applicable standard(s) mentioned in chapter 1.1 were NOT passed under conditions of use (chapter 4.1).
- This means that the tested EUT is NOT in compliance with the harmonized standard as mentioned in chapter 1.1
- The test results presented in this report are valid for the tested/assessed sample(s) only since product reproducibility is not within the scope.
- This report can be used as a reference for the declaration of conformity for low-voltage directive 2014/35/EU.
- At request of the costumer Single Fauld Conditions (SFC) are not performed to reduce the risk of malfunctions / defects of the EUT

3.1 OBSERVATIONS

- A lot of dust / pollution is founded in the EUT. The EUT is evaluated for pollution degree 2. If the environment is pollution degree 3 the openings in the EUT shall be protected with filter material (FAN inlet / outlet)
- The wires to the battery can be shifted in and out the enclosure, it is better to use a cable anchor to protect the cable

4 EVALUATION CONDITIONS

4.1 CONDITIONS OF USE

- The product is evaluated for a maximum ambient temperature of 40°C
- IP tests are not part of this investigation
- External PC is not part of this evaluation
- External batteries are not part of this evaluation (only used for load conditions)
- Internal power supplies provide double or reinforced insulation, are already certified and not part of this evaluation

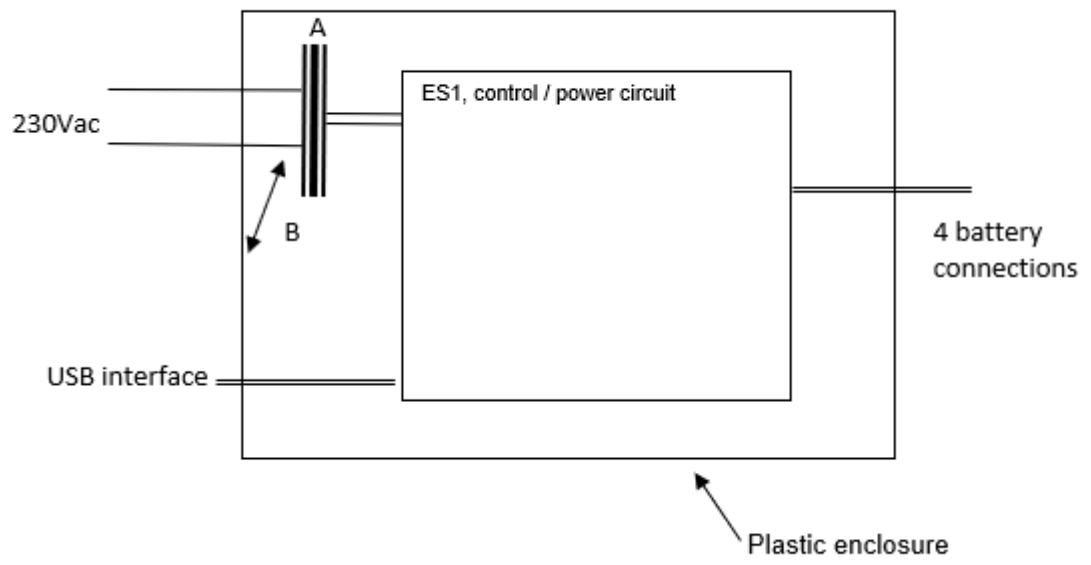
4.2 ENVIRONMENTAL TEST CONDITIONS

- Ambient temperature: 23°C (+/- 5°C)
- Relative humidity: 45% (+/- 15%)

4.3 TEST SETUP

- EUT powered with 230Vac, 4 batteries connected and charged or discharged

5 ENERGY / ISOLATING DIAGRAM



Location or description	Insulation type (NOTE 1)	Maximum working voltage (NOTE 2)	
A	DI/RI	230	Insulation by certified power supplies (2x)
B	DI/RI	230	Isolation by enclosure

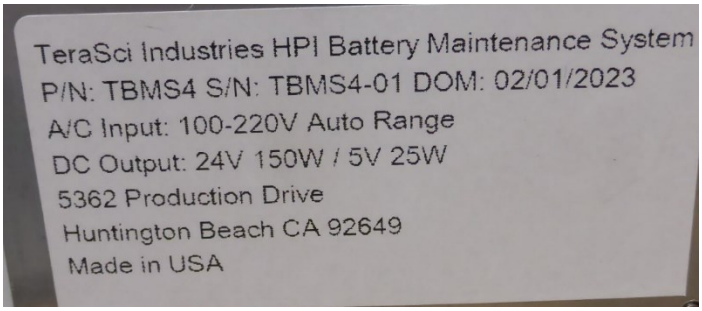
NOTE 1 – Type of insulation:	NOTE 2 - Types of voltage	NOTE 3 - INSTALLATION CATEGORIES
BI = BASIC INSULATION	Peak impulse test voltage (pulse)	(OVERVOLTAGE CATEGORIES)
DI = DOUBLE INSULATION	r.m.s.	or POLLUTION DEGREES which differ from
PI = PROTECTIVE IMPEDANCE	d.c.	these should be shown under "Comments".
RI = Reinforced INSULATION	peak	
SI = Supplementary INSULATION		
Supplementary Information:		

6 ENERGY SOURCES IDENTIFICATION TABLE

Electrically-caused injury (Clause 5) (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification)	
Example: +5 V dc input	ES1
Source of electrical energy	**Corresponding classification (ES)**
Input voltage: 230Vac	ES3
Control circuit: 24Vdc and 5Vdc	ES1
Electrically-caused fire (Clause 6) (Note: List sub-assembly or circuit designation and corresponding energy source classification)	
Example: Battery pack (maximum 85 watts)	PS2
Source of power or PIS	**Corresponding classification (PS)**
Mains input circuit	PS3
Control circuit (behind transformer, 24Vdc)	PS3
Control circuit (behind transformer, 5Vdc)	PS2
Injury caused by hazardous substances (Clause 7) (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.)	
Example: Liquid in filled component	Glycol
Source of hazardous substances	**Corresponding chemical**
None	N/A
Mechanically-caused injury (Clause 8) (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.)	
Example: Wall mount unit MS2	MS2
Source of kinetic/mechanical energy	**Corresponding classification (MS)**
No sharp edges	MS1
Weight	MS1
Thermal burn injury (Clause 9) (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	TS1
Source of thermal energy	**Corresponding classification (TS)**
Enclosure	TS1
Radiation (Clause 10) (Note: List the types of radiation present in the product and the corresponding energy source classification.)	

Example: DVD – Class 1 Laser Product	RS1
Type of radiation	**Corresponding classification (RS)**
LED (Indication LED)	RS1

7 MARKING AND DOCUMENTATION

Test item description	HPI
Trade mark	
Manufacturer	
Model/type reference	TBMS4
Ratings	110-230Vac, 50/60Hz, output: 24V, 150W and 5V, 25W
Sample of marking plate	

8 SUMMATION OF REQUIREMENTS

Test case verdicts	
Test case does not apply to the test object :	N/A
Test item does meet the requirement ...:	P(ass)
Test item does not meet the requirement :	F(ail)
Testing	
Date of receipt of test item .....:	13 June 2022
Date(s) of performance of test .....:	12 July 2023

IEC 62368-1 (ed.2) & IEC 60065 (ed.8) & IEC 60950-1 (ed.2), am1; am2			
CLAUSE	**REQUIREMENT + TEST**	**RESULT - REMARK**	**VERDICT**
4	**GENERAL REQUIREMENTS**		P
4.1.1	Acceptance of materials, components and subassemblies (IEC 60065, 3.4) & (IEC 60950-1, 1.5.1)		P
4.1.2	Use of components (IEC 60065, 3.4, 14.1) & (IEC 60950-1, 1.5.2)	For safety, certified components are used according with their ratings and certifications. (see table 1)	-
4.1.3	Equipment design and construction (IEC 60065, 3.1) & (IEC 60950-1, 1.3.2)	Enclosure shall be a fire enclosure with a flammability of min. UL94V-1 Battery connections protected by a 3A internal fuse	P
4.4.4	Safeguard robustness	(See Annex T.3, T.4, T.5, T.6, T.7, T.8, T.9)	P
4.5	Explosion		N/A
4.6	Fixing of conductors (IEC 60065, 8.14) & (IEC 60950-1, 3.1.9)		P
4.7	Equipment for direct insertion into mains socket –outlets (IEC 60065, 15.4) & (IEC 60950-1, 4.3.6)		N/A
4.8	Products containing coin/button cell batteries (IEC 60065, 12.7)		N/A
4.9	Likelihood of fire or shock due to entry of conductive object (IEC 60065, 9.1.3, 20.3.2) & (IEC 60950-1, 4.6.1)		---

5	ELECTRICALLY-CAUSED INJURY		P
5.2.1	Electrical energy source classifications	(See appended table 5.2)	----
5.2.2	ES1, ES2 and ES3 limits	ES1 and ES3 circuits	P
5.3	Protection against electrical energy sources (IEC 60065, 9.1.1) & (IEC 60950-1, 2.1)	All ES3 circuits in enclosure	P
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons (IEC 60065, 9.1.1) & (IEC 60950-1, 2.1)	No ES3 bare parts could be touched without the need of a tool	P
5.4	Insulation materials and requirements		P
5.4.2	Clearances (IEC 60065, 13.3, Annex J) & (IEC 60950-1, 2.10.3, Annex G)	Between ES3 and ES1 circuits	P
5.4.3	Creepage distances (IEC 60065, 13.4) & (IEC 60950-1, 2.10.4)	Between ES3 and ES1 circuits	----
5.4.4	Solid insulation (IEC 60065, 8.8) & (IEC 60950-1, 2.10.5)	Part of certified power supplies	P
5.4.5	Antenna terminal insulation (IEC 60065, 10.2) & (IEC 60950-1, 7.4)		N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard (IEC 60065, 8.9) & (IEC 60950-1, 2.1.1.3)		----
5.4.7	Tests for semiconductor components and for cemented joints (IEC 60065, 13.6, 13.7, 13.8) & (IEC 60950-1, 2.10.11)		N/A
5.4.8	Humidity conditioning		N/A
5.4.9	Electric strength test (IEC 60065, 10.4) & (IEC 60950-1, 5.2)		---
5.4.10	Protection against transient voltages between external circuit (IEC 60065, Annex B) & (IEC 60950-1, 6.2)		N/A
5.4.11	Insulation between external circuits and earthed circuitry (IEC 60065, Annex B) & (IEC 60950-1, 6.1)		---
5.5	Components as safeguards		P
5.5.1	General		P

5.5.2	Capacitors and RC units (IEC 60065, 14.3)		N/A
5.5.3	Transformers (IEC 60065, 14.4) & (IEC 60950-1, 1.5.4, Annex C)	Two internal certified power supplies	P
5.5.4	Optocouplers (IEC 60065, 14.12) & (IEC 60950-1, 2.10.5.3, 2.10.5.4)		N/A
5.5.5	Relays		N/A
5.5.6	Resistors (IEC 60065, 14.2) & (IEC 60950-1, 1.5.7)		N/A
5.5.7	SPD's (IEC 60065, 14.13) & (IEC 60950-1, 1.5.9)		N/A
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable (IEC 60065, 10.2) & (IEC 60950-1, 1.5.7.3, 7.4)		---
5.6	Protective conductor		P
5.6.2	Requirement for protective conductors (IEC 60065, 15.2) & (IEC 60950-1, 2.6.3, 2.6.5)	PE only for connection to the internal power supplies enclosure is non-conductive and not connected to PE	P
5.6.3	Requirement for protective earthing conductors (IEC 60065, 15.2) & (IEC 60950-1, 2.6.3.2)		P
	Protective earthing conductor size (mm2)		---
5.6.4	Requirement for protective bonding conductors		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.6	Resistance of the protective system (IEC 60065, 15.2) & (IEC 60950-1, 2.6.3.4)		N/A
5.6.7	Reliable earthing (IEC 60065, 14.13) & (IEC 60950-1, 1.5.9.4, 5.1.7.1)		N/A
5.7	Prospective touch voltage touch current and protective conductor current		P
5.7.2	Measuring devices and networks		P
5.7.2.1	Measurement of touch current (IEC 60065, 9.1.1.2) & (IEC 60950-1, 5.1.4)		---
5.7.4	Earthed conductive accessible parts		N/A

	(IEC 60065, 9.1.1.2) & (IEC 60950-1, 5.1.6)		
5.7.5	Protective conductor current (IEC 60950-1, 5.1.7)		P
5.7.6	Prospective touch voltage and touch current due to external circuits (IEC 60950-1, 5.1.8)		N/A
5.7.7	Summation of touch currents from external circuits (IEC 60950-1, 5.1.8.2)		N/A
6	**ELECTRICALLY- CAUSED FIRE**		P
6.2	Classification of power sources (PS) and potential ignition sources (PIS)		P
6.2.2	Power source circuit classifications	(See appended table 6.2.2)	P
6.3	Safeguards against fire under normal operating and abnormal operating conditions		P
6.4	Safeguards against fire under single fault conditions		P
6.4.1	Safeguard method	Reduce the likelihood of ignition method is used	P
6.4.3.2	Reduce the likelihood of ignition	Max. output current in case of an overload or other SFC on each output is 3Adc	P
6.4.4	Control of fire spread in PS1 circuits		P
6.4.5	Control of fire spread in PS2 circuits		N/A
6.4.6	Control of fire spread in PS3 circuits	SFC not performed to protect the EUT All components are mounted on UL94V-1 or better -> PASS Battery output protected with 3A fuse -> PS2 circuit -> PASS	P
6.4.7	Separation of combustible materials from a PIS (IEC 60065, 20.2.5) & (IEC 60950-1, 4.7.3.4)		N/A
6.5	Internal and external wiring		P
6.6	Safeguards against fire due to connection to additional equipment (IEC 60950-1, 3.5.4)		N/A
	External port limited to PS2 or complies with Clause Q.1		N/A

7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		N/A
7.2	Reduction of exposure to hazardous substances		N/A
7.3	Ozone exposure (IEC 60950-1, 1.7.2.6)		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 (IEC 60065, 14.10) & (IEC 60950-1, 4.3.8)		N/A
8	**MECHANICALLY-CAUSED INJURY**		P
8.1	General		P
8.2	Mechanical energy source classifications	MS1, EUT -> 5.1kg	P
8.3	Safeguards against mechanical energy sources	MS1, no additional safeguards required	N/A
8.4	Safeguards against parts with sharp edges and corners (IEC 60065, 19.5) & (IEC 60950-1, 4.3.1)	No such	N/A
8.5	Safeguards against moving parts	Finger guard mounted for fan blades	P
8.6	Stability (IEC 60065, 19) & (IEC 60950-1, 4.1)		P
8.7	Equipment mounted to wall or ceiling (IEC 60065, 19.7) & (IEC 60950-1, 4.2.10)	No such	N/A
8.8	Handles strength	No such	N/A
8.9	Wheels or casters attachment requirements	No such	N/A
8.10	Carts, stands and similar carriers	No such	N/A
8.11	Mounting means for rack mounted equipment (IEC 60950-1, Annex DD)	No such	N/A
8.12	Telescoping or rod antennas (IEC 60065, 12.6)	No such	-
	Button/Ball diameter (mm)		-

9	**THERMAL BURN INJURY**		P
9.2	Thermal energy source classifications (IEC 60065, 7.1, 11.2) & (IEC 60950-1, 4.5.4)	Enclosure TS1	P
9.3	Safeguard against thermal energy sources (IEC 60065, 7.1, 11.2) & (IEC 60950-1, 4.5.4)		N/A
9.4	Requirements for safeguards		N/A
10	**RADIATION**		P
10.2	Radiation energy source classification	RS1, signalling LED only	P
10.3	Protection against laser radiation (IEC 60065, 6.2) & (IEC 60950-1, 4.3.13.5.1)		N/A
10.4	Protection against visible, infrared, and UV radiation (IEC 60065, 6.3) & (IEC 60950-1, 4.3.13.4, 4.3.13.5.2)		N/A
10.5	Protection against x-radiation (IEC 60065, 6.1) & (IEC 60950-1, 4.3.13.2)		N/A
10.6	Protection against acoustic energy sources		N/A
B	**NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS**		P
B.2	Normal Operating Conditions	(See appended table B.2.5)	P
B.3	Simulated abnormal operating conditions		P
B.4	Simulated single fault conditions (IEC 60065, 4.3) & (IEC 60950-1, 1.4.14)	Bridging functional insulation will not result in a hazard. Only schematics reviewed, not tested	P
C	**UV RADIATION**		N/A
C.1	Protection of materials in equipment from UV radiation (IEC 60950-1, 4.3.13.3)		N/A
D	**TEST GENERATORS**		N/A
D.1	Impulse test generators (IEC 60065, Annex K) & (IEC 60950-1, N.1)		N/A
D.2	Antenna interface test generator (IEC 60950-1, N.2)		N/A
D.3	Electronic pulse generator		N/A

E	**TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS**		N/A
E.1	Audio amplifier normal operating conditions (IEC 60065, 4.2.5) & (IEC 60950-1, 4.5.1)		N/A
E.2	Audio amplifier abnormal operating conditions (IEC 60065, 4.3.6) & (IEC 60950-1, 5.3.6)		N/A
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P
F.1	General requirements (IEC 60065, 5.1, 5.2, 5.3) & (IEC 60950-1, 1.7.2.1)		P
	Instructions – Language	English instructions reviewed	---
F.2	Letter symbols and graphical symbols (IEC 60065, 5.1)		P
F.3	Equipment markings		P
F.3.1	Equipment marking locations (IEC 60065, 5.1) & (IEC 60950-1, 1.7.1.2)		P
F.3.2	Equipment identification markings (IEC 60065, 5.2) & (IEC 60950-1, 1.7.1.2)	See marking plate	P
F.3.3	Equipment rating markings (IEC 60065, 5.2) & (IEC 60950-1, 1.7.1.1)	See marking plate	P
F.3.4	Voltage setting device (IEC 60065, 5.2 e)) & (IEC 60950-1, 1.7.4)		N/A
F.3.5	Terminals and operating devices	The position of the disconnect switch shall are identified (on/off)	P
F.3.6	Equipment markings related to equipment classification		N/A
F.3.7	Equipment IP rating marking (IEC 60065, A.5)		---
F.3.8	External power supply output marking (IEC 60065, 5.3 c))		N/A
F.3.9	Durability, legibility and permanence of marking (IEC 60065, 5.1) & (IEC 60950-1, 1.7.11)		N/T

F.3.10	Test for permanence of markings (IEC 60065, 5.1) & (IEC 60950-1, 1.7.11)		N/T
F.4	Instructions (IEC 60065, 5.4, 5.5.2) & (IEC 60950-1, 1.7.2.1, 1.7.14, 5.1.7, 3,4,3)		P
F.5	Instructional safeguards (IEC 60065, 5.4, 5.5)		N/A
G	**COMPONENTS**		P
G.1	Switches (IEC 60950-1, 2.8.7)		N/A
G.2	Relays (IEC 60065, 14.4.3) & (IEC 60950-1, 2.8.7)		N/A
G.3	Protection Devices		N/A
G.4	Connectors		N/A
G.5	Wound Components		N/A
G.5.4	Motors		N/A
G.6	Wire Insulation		N/A
G.7	Mains supply cords		P
G.8	Varistors		N/A
G.9	Integrated Circuit (IC) Current Limiters (IEC 60950-1, Annex CC)		N/A
G.10	Resistors (IEC 60065, 14.2) & (IEC 60950-1, 1.5.7)		N/A
G.11	Capacitor and RC units (IEC 60065, 14.3) & (IEC 60950-1, 1.5.6)		N/A
G.12	Optocouplers		N/A
G.13	Printed boards (IEC 60065, 13.5) & (IEC 60950-1, 2.10.6)		P
G.14	Coating on components terminals		N/A
G.15	Liquid filled components		N/A
G.16	IC including capacitor discharge function (ICX)		N/A
H	**CRITERIA FOR TELEPHONE RINGING SIGNALS**		N/A
H.1	General (IEC 60950-1, M.1)		N/A

J	**INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION**		N/A
	General requirements (IEC 60065, Annex H) & (IEC 60950-1, Annex U)		N/A
K	**SAFETY INTERLOCKS**		N/A
K.1	General requirements (IEC 60065, 14.8) & (IEC 60950-1, 2.8.1, 2.8.2)		N/A
L	**DISCONNECT DEVICES**		P
L.1	General requirements (IEC 60065, 5.5.3) & (IEC 60950-1, 3.4.1, 3.4.2)	Power switch act as disconnecting device	P
M	**EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS**		N/A
M.1	General requirements (IEC 60065, 5.5.2 c)) & (IEC 60950-1, 1.7.13)		N/A
M.2	Safety of batteries and their cells (IEC 60065, 14.11.1) & (IEC 60950-1, 4.3.8)		N/A
M.3	Protection circuits (IEC 60950-1, 4.3.8)		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.4.3	Fire Enclosure		N/A
M.4.4	Endurance of equipment containing a secondary lithium battery		N/A
M.5	Risk of burn due to short circuit during carrying		N/A
M.6	Prevention of short circuits and protection from other effects of electric current		N/A
M.7	Risk of explosion from lead acid and NiCd batteries		N/A
M.8	Protection against internal ignition from external spark sources of lead acid batteries		N/A
M.9	Preventing electrolyte spillage		N/A

M.10	Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing) (IEC 60065, 5.5.1)		N/A
N	**ELECTROCHEMICAL POTENTIALS**		P
	Metal(s) used (IEC 60065, Annex F) & (IEC 60950-1, Annex J)		-
O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**		P
	Figures O.1 to O.20 of this Annex applied (IEC 60065, Annex E) & (IEC 60950-1, Annex F)		-
P	**SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF INTERNAL LIQUIDS**		P
P.1	General requirements		P
P.2.2	Safeguards against entry of foreign object (IEC 60065, 9.1.3) & (IEC 60950-1, 4.6.1)		P
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 (IEC 60950-1, 4.6.1, 4.6.4.3)		N/A
P.3	Safeguards against spillage of internal liquids		N/A
P.4	Metallized coatings and adhesive securing parts		N/A
Q	**CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING**		N/A
Q.1	Limited power sources (IEC 60950-1, 2.5)		N/A
Q.2	Test for external circuits – paired conductor cable (IEC 60950-1, 6.3)		N/A
R	**LIMITED SHORT CIRCUIT TEST**		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)).		-

S	**TESTS FOR RESISTANCE TO HEAT AND FIRE**		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		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		N/A
S.3	Flammability test for the bottom of a fire enclosure (IEC 60950-1, A.3)		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
T	**MECHANICAL STRENGTH TESTS**		P
T.1	General requirements		P
T.2	Steady force test, 10 N (IEC 60065, 13.3.1) & (IEC 60950-1, 4.2.2)		P
T.3	Steady force test, 30 N (IEC 60065, 13.3.1) & (IEC 60950-1, 4.2.3)		P
T.4	Steady force test, 100 N (IEC 60065, 9.1.7)		P
T.5	Steady force test, 250 N (IEC 60065, 9.1.7) & (IEC 60950-1, 4.2.4)		P
T.6	Enclosure impact test (IEC 60065, 12.1.4) & (IEC 60950-1, 4.2.5)		P
T.7	Drop test (IEC 60065, 12.1.5) & (IEC 60950-1, 4.2.6)		N/A
T.8	Stress relief test (IEC 60065, 12.1.6) & (IEC 60950-1, 4.2.7)		N/A
T.9	Impact Test (glass) (IEC 60065, 19.6.1) & (IEC 60950-1, 4.2.5)		N/A
T.10	Glass fragmentation test (IEC 60065, 19.6.2)		N/A
T.11	Test for telescoping or rod antennas (IEC 60065, 12.6)		N/A
U	**MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION**		N/A

	AGAINST THE EFECTS OF IMPLOSION		
U.1	General requirements (IEC 60065, 18.1) & (IEC 60950-1, 4.2.8)		N/A
V	**DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)**		N/A
V.1	Accessible parts of equipment (IEC 60065, 9.1.1.3, 9.1.3, 9.1.4) & (IEC 60950-1, 1.7.2.5, 2.1.1.1, EE.5)		N/A

9 MEASUREMENTS

9.1 CRITICAL COMPONENTS

4.1.2	Table: List of critical components				-
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1]**
PCB	Various	-	UL94V-0	UL94	UL, #
Appliance inlet	Various		250V, 10A	-	#
Power supply 1	Morsun	LM50-23B05	85…305Vac, 47…63Hz, 0.8A output: 5Vdc, 10A, -30…+70°C	EN62368-1 EN60335-1	UR, CE, #
Power supply 2	Mean Well	S-210-15	176…264Vac, 47…63Hz, 2.5A output: 15Vdc, 14A, -20…+50°C	EN60950-1	UR, #
Internal wiring primary	Various	Style 1007	300V, 1, FT1, 80°C		
Internal wiring secondary	Various	Style 1007	300V. 18awg, FT1, 80°C	-	UL, #
Battery charge / discharge board	TeraSci Inc.	Rev. C6	-	-	#
Tester connector Board	TeraSci Inc.	Rev. C3	-	-	#
HP battery connector	TeraSci Inc.	Rev. H1	-	-	
Enclosure	-	-	620x265x135mm	-	#

Supplementary information:

[1] Provided evidence ensures the agreed level of compliance. See OD-CB2039.
An # indicates the component is tested as part of the appliance

9.2 BATTERIES

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		**Unintentional charging**	**Charging (mA)**		**Discharging (mA)**		**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		N/A
- Explosion of the battery		N/A
- Emission of flame or expulsion of molten metal		N/A
- Electric strength tests of equipment after completion of tests		N/A
Supplementary information:		

9.3 ELECTRICAL ENERGY SOURCES

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: touch voltage and touch current			ES Class
				U (Vrms or Vpk)	I (mApk or mArms)	Hz	
1	230Vac	Input power	Normal	-	-	-	ES3
			Abnormal	-	-	-	
			Single fault – SC/OC	-	-	-	
2	24Vdc / 5Vdc	Electronic circuit behind power supplies	Normal	24.0	0.005	-	ES1
			Abnormal	24.0	0.005	-	
			Single fault – SC/OC	24.0	0.005	-	
Supplementary information:							

9.4 TEMPERATURE MEASUREMENTS

5.4.1.4, 6.3.2, 9.0, B.2.6	Table: Temperature measurements				P
Supply voltage (V)	230Vac[1]	230Vac[2]	230Vac[3]	*	---
Ambient Tmax (°C)	40.0	40.0	40.0		---
Tma (°C)	40.0	40.0	40.0		---
Maximum measured temperature T of part/at:	**T (°C)**				**Allowed Tmax (°C)**
Mains appliance inlet	24.5	25.9	26.1	36.3	-
Mains switch	24.4	26.5	28.8	36.2	-
Internal temperature near power supplies	26.0	27.5	33.7	37.8	50.0#
Internal temperature near heat sink	24.2	27.9	28.5	36.0	50.0#
DC wiring battery	24.4	24.7	25.4	36.2	-
Case battery	28.2	30.0	29.3	40.0	-
Enclosure, case top	24.2	26.1	26.7	36.0	94.0
Enclosure, case bottom	24.3	25.7	27.1	36.1	94.0
Enclosure, case front	24.3	25.4	26.2	36.1	94.0
Enclosure, case back	23.9	25.2	26.4	35.7	94.0
Ambient	23.8	23.7	24.2	-	-

*) measured temperature of [1]) extrapolated to 40°C

#) based on the max. ambient temperature of the internal power supplies

[1]) 4 batteries connected and in charge mode

[2]) 4 batteries connected and in discharge mode

[3]) 4 batteries connected and in charge mode but FAN stalled (SFC)

9.5 CLEARANCE AND CREEPAGE

5.4.2.2, 5.4.2.4 and 5.4.3	Table: Minimum Clearances/Creepage distance						P
Clearance (cl) and creepage distance (cr) at/of/between:	**Up (V)**	**U r.m.s. (V)**	**Frequency (kHz)[1]**	**Required Cl (mm)**	**cl (mm)[2]**	**Required[3] Cr (mm)**	**cr (mm)**
Basic insulation:							
L/N -> PE, internal wiring	-	230	-	1.5	>5.0	2.3	>5.0
Reinforced:							
L/N -> ES1 circuit	-	230	-	3.0	>5.0	4.6	>5.0
Part of certified power supplies							
Supplementary information: Short circuit the functional insulation complies with B4.4 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: Based on material Group IIIb							

9.6 ELECTRIC STRENGTH

5.4.9	Table: Electric strength tests		P
Test voltage applied between:	**Voltage shape (AC, DC)**	**Test voltage (V)**	**Breakdown Yes/No**
Basic/supplementary:			
L+N -> PE	AC	1500	No
Reinforced:			
L+N -> Battery power circuit	DC	4000	No
L+N -> USB, battery communication	DC	4000	No
L+N -> USB, PC connection	DC	4000	No
Supplementary information:			

9.7 PROTECTIVE CONDUCTORS

5.6.6.2	Table: Resistance of protective conductors and terminations			N/A
Accessible part	**Test current (A)**	**Duration (min)**	**Voltage drop (V)**	**Resistance (mΩ)**
Supplementary information: PE only for connection towards internal power supplies, no conductive surfaces available				

9.8 TOUCH CURRENT

5.7	Table: Access to energized parts		P
Item	**Description**	**Determination method (note 5)**	**Comments**
1	Enclosure	V	
2	Battery power interfaces	V,J	
3	USB interface to PC	V,J	

Note 1 – test fingers and pins are to be applied without force unless a force is specified

Note 2 – special consideration should be given to inadequate insulation and high voltage parts

Note 3 – parts are considered to be ACCESSIBLE if they could be touched in the absence of any covering which is not considered to provide suitable insulation

Note 4 – capacitor test may be required

Note 5 – the determination methods are: v = visual; r = rigid test finger; j = jointed test finger; p3 = pin 3 mm diameter; p4 = pin 4 mm diameter.

Supplementary information: Class III device, ES1

5.7.2.2, 5.7.4	TABLE: (Earthed) accessible (conductive) parts			P
Item	**Current**			
(see previous table)	**U2 (mV)**	**mA (r.m.s.) PE connected**	**mA (r.m.s.) PE-open**	**Comments**
1	0.0	0	0	
2	2.5	0.005	0.005	
3	2.5	0.005	0.005	

Supplementary information:

9.9 ELECTRICAL POWER SOURCES AND IGNITION SOURCES

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*)**	**PS Classification**
A	230Vac input power	Power (W) .....:	-	-	PS3
		VA (V).....:	-	-	
		IA (A) .....:	-	-	
B	All electronics behind transformer 1	Power (W) .....:	-	51.3	PS3
		VA (V).....:	-	12.5	
		IA (A) .....:	-	4.1	
C	All electronics behind transformer 2	Power (W) .....:	-	65.7	PS2
		VA (V).....:	-	4.5	
		IA (A) .....:	-	14.6	
Supplementary Information:					

6.2.3.1	TABLE: Determination of Potential Ignition Sources (Arcing PIS)			P
Location	**Open circuit voltage After 3 s (Vp)**	**Measured r.m.s current (Irms)**	**Calculated value (V_p x I_{rms})**	**Arcing PIS? Yes / No**
Supplementary information: Mains circuit is evaluated as an arcing PIS. 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 (Vp) and normal operating condition rms current (Irms) 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**
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, or (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.					

9.10 EQUIPMENT RATINGS

B.2.5	Table: Input test						-
U (V)	**I (mA)**	**I rated (A)**	**P (mW)**	**P rated (W)**	**Fuse No**	**I fuse (A)**	**Condition/status**
230	600	-	126	-	-	-	4 batteries in charge mode
230	150	-	134	-	-	-	Discharge 4 batteries
230	150	-	134	-	-	-	standby
Supplementary information: No marking on EUT							

9.11 FAULT CONDITIONS

B.3, B.4	Table: Abnormal operating and Fault condition tests					N/T
Ambient temperature (°C) .....:				22.0		—
Power source for EUT: Manufacturer, model/type, output rating ..:				-		—
Component No.	**Abnormal / Fault Condition**	**Supply voltage, (V)**	**Test time (min.)**	**Fuse no.**	**current, (mA)**	**Observation**
Supplementary information: s.c. -> short circuit, o.l. -> overload test						

9.12 INTERCONNECTIONS

Annex Q.1	**Table: intended for interconnection with building wiring (LPS)**					N/A
Note: Measured UOC (V) with all load circuits disconnected:						
Output Circuit	**Components**	**Uoc (V)**	**Isc (A)**		**S (VA)**	
			Meas.	**Limit**	**Meas.**	**Limit**
				<8.0		<100
Supplementary information: SC -> short circuit, OC. -> open circuit						

10 USED EQUIPMENT

Description	Type	Brand
Multimeter	185, true RMS multimeter	Fluke
Multimeter	179, true RMS multimeter	Fluke
Temperature logger	34970A + 34901A	Agilent
AC adjustable power supply	BL1350	Behlman
Power meter	WT200	Yokogawa
Hi-pot tester	GPT9804	GWInstek
True RMS clamp meter	325	Fluke
Oscilloscope	DS1052E	Rigol Technologies
Electrical load	6050A system	Hewlett Packard
Calliper	500-184-30	Mitutoyo
Test finger	MP-100.04A	Stahl
500gr. Steel ball	MP-100.04L	Stahl

Conclusion Compliance Low Voltage Directive	**IN COMPLIANCE**

ANNEX III TEST REPORT EMC

1. PRODUCT (EUT) DESCRIPTION

1.1 TECHNICAL INFORATION OF THE PRODUCT (EUT)

Item	Description
Name	HPI Battery charge system
Manufacturer	--
Brand name	--
Type or model no.	N/A
Serial no.	N/A
Rated voltage	230Vac
Rated current /power	N/A
Software version	N/A
Hardware version	Unknown
Dimensions	-
Protection Class	I
Environmental to be used	Domestic
Peripheral equipment	June 2022/July 2023
General remarks	None

1.2 CABLES AND ANCILLARY EQUIPMENT

Description	Port type	Type of cable	Cable length (cm)	Fixing shield	Load at port
AC input	AC	Unshielded	200	Not applicable	N/A

1.3 GENERAL DESCRIPTION

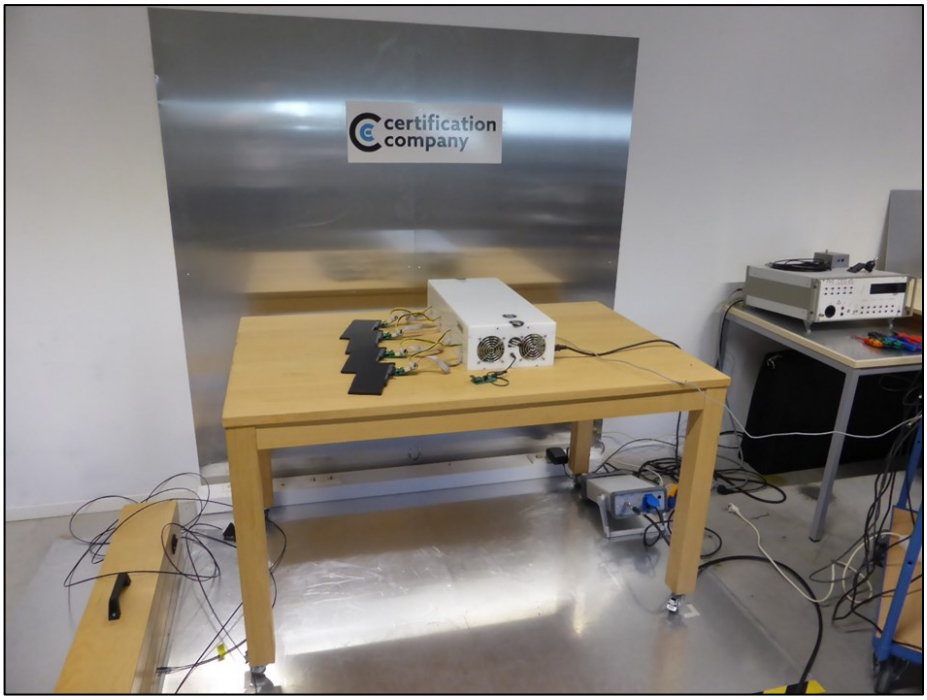


Photo 1 - Front View

1.4 MODES OF OPERATION AND PERFORMANCE CRITERIA

The modes of operation can be found in the table below:

Mode of operation	Description
Mode 1	Normal operational, charging 4 batteries. During immunity the charging process is checked with a clamp meter and via the PC test program

Performance criteria during the immunity test are verified according to the information that is laid down in the table below:

Mode of operation	Performance criteria
Mode 1	**Performance criteria A**: During testing, normal performance within the specification of the EUT. **Performance criteria B**: During testing, temporary degradation, or loss of function or performance is allowed if it is self-recovering. **Performance criteria C**: During testing, temporary degradation, or loss of function or performance is allowed which requires operator intervention or system reset.

1.5 STANDARDS AND MEASUREMENTS RESULTS

The following standard(s) are used to verify if the EUT is in compliance with the essential requirements of the EMC Directive 2014/30/EU.

Phenomena	Standard	Result
Emission	EN 55032:2015	**PASS**
Immunity	EN 55035:2017+A11:2020	**PASS**

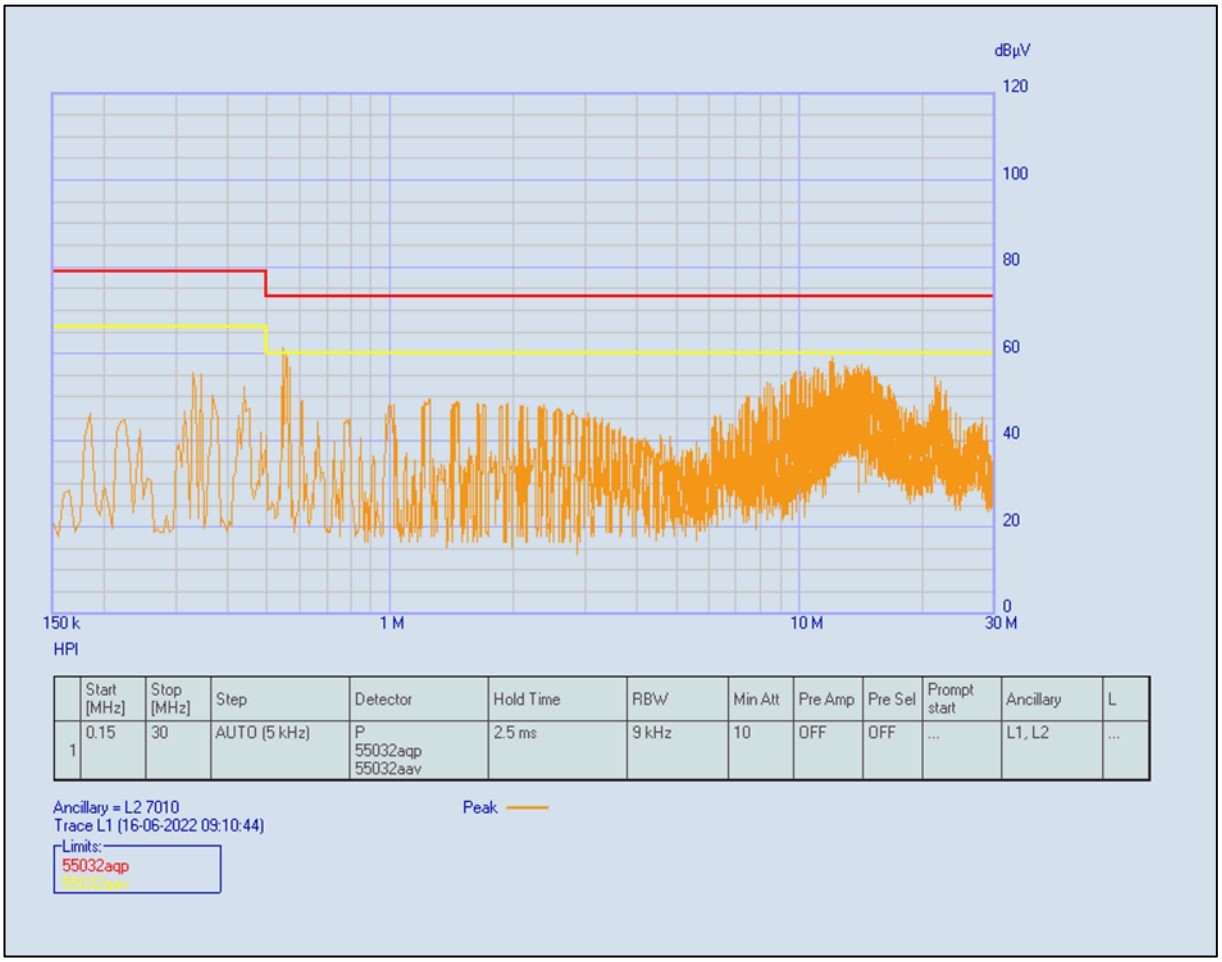
Detailed test information:

Test sequence	Test phenomena	Basic standard	Result (Pass/Fail)
1	Conducted emission (9 kHz – 30 MHz), Class A	EN 55032-1:2015	**PASS**
2	Radiated emission (30 – 1000 MHz), Class A	EN 55032-1:2017	**PASS**
3	Conducted immunity (0.15 – 80 MHz)	EN 61000-4-6:2014	**PASS**
4	Radiated immunity (80 – 1000 MHz)	EN 61000-4-3:2016/A1:2008	**PASS**
5	EFT tests	EN 61000-4-4:2012	**PASS**
6	Surge test	EN 61000-4-5:2014	**PASS**
7	ESD tests	EN 61000-4-2:2009	**PASS**
8	Voltage dips and interrupts	EN61000-4-11:2004/A1:2017	**PASS**
Remark:			

2. CONDUCTED EMISSION RESULTS

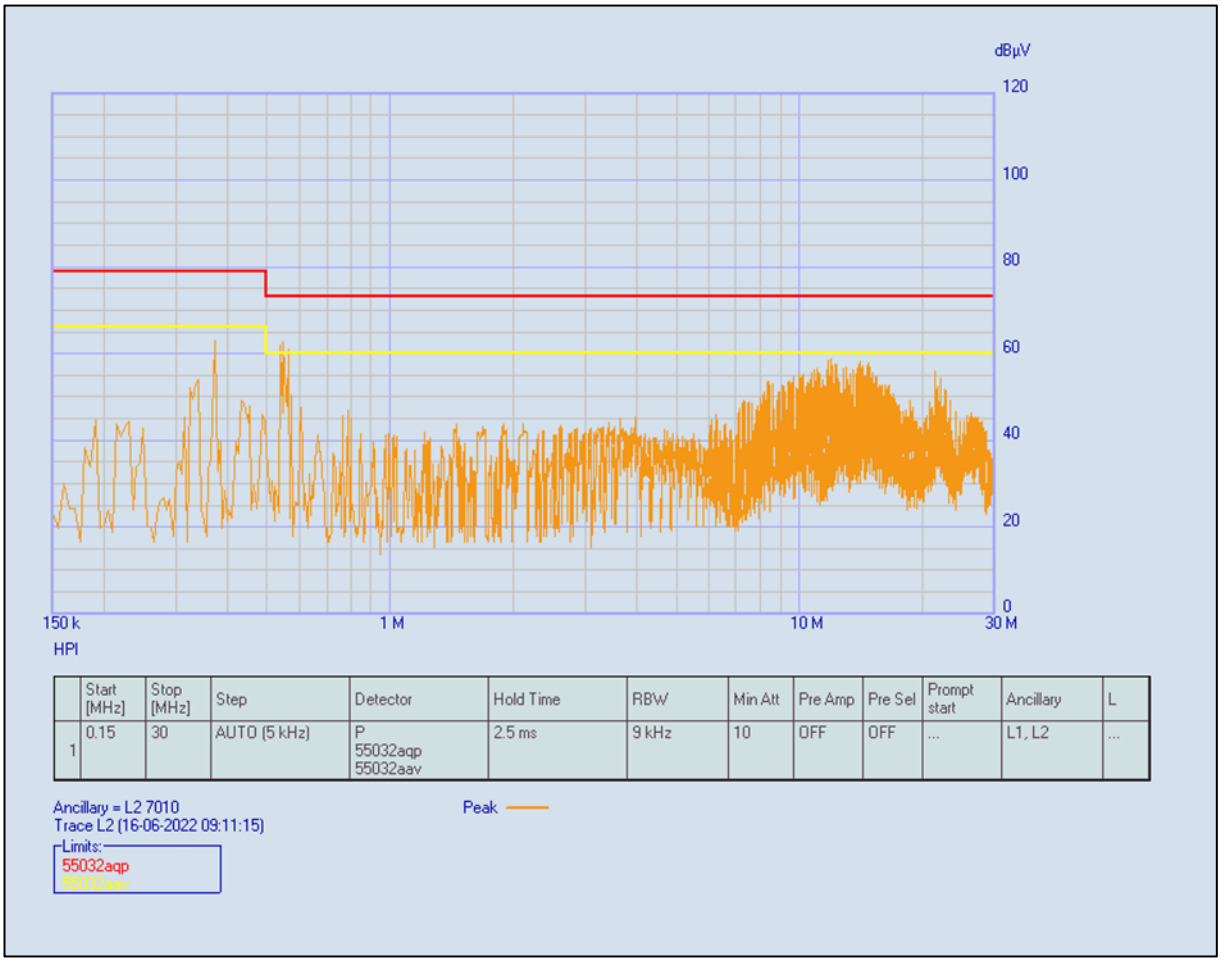
Temperature	21 °C	**Air pressure**	1014 hpa
Humidity	60 %	**Remarks**	EN 55032 Class A

Description	Description: 6) Setting: Frequency band From 150 kHz to 30 MHz
Note	Line



Detected Peaks Line								
Peak Number	**Frequency**	**Quasi-Peak**	**Quasi-Peak Limit**	**Quasi-Peak Delta**	**Average**	**Average Limit**	**Average Delta**	**Status**
1	0.375	63.01	79.00	-15.99	52.67	66.00	-13.33	**PASS**
2	0.55	59.94	73.00	-13.06	50.38	60.00	-9.62	**PASS**
3	10.035	54.37	73.00	-18.63	45.08	60.00	-14.92	**PASS**
4	10.84	54.95	73.00	-18.05	45.16	60.00	-14.84	**PASS**
5	12.025	57.48	73.00	-15.52	49.53	60.00	-10.47	**PASS**
6	12.84	54.33	73.00	-18.67	45.71	60.00	-14.29	**PASS**
7	14.02	56.58	73.00	-16.42	49.79	60.00	-10.21	**PASS**
8	21.315	54.02	73.00	-18.98	45.62	60.00	-14.38	**PASS**
RESULT	**PASS**							

Description	Description: 8) Setting: Frequency band From 150 kHz to 30 MHz
Note	Neutral



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary	L
1	0.15	30	AUTO (5 kHz)	P 55032aqp 55032aav	2.5 ms	9 kHz	10	OFF	OFF	...	L1, L2	...

Detected Peaks Neutral								
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Delta	Average	Average Limit	Average Delta	Status
1	0.375	62.62	79.00	-16.38	52.27	66.00	-13.73	PASS
2	0.55	62.03	73.00	-10.97	52.44	60.00	-7.56	PASS
3	10.035	53.95	73.00	-19.05	44.64	60.00	-15.36	PASS
4	10.84	54.62	73.00	-18.38	44.86	60.00	-15.14	PASS
5	12.025	57.28	73.00	-15.72	49.33	60.00	-10.67	PASS
6	12.84	54.68	73.00	-18.32	46.11	60.00	-13.89	PASS
7	14.02	56.65	73.00	-16.35	49.80	60.00	-10.20	PASS
8	21.315	55.44	73.00	-17.56	49.64	60.00	-10.36	PASS
RESULT	PASS							

Photo measurement set-up

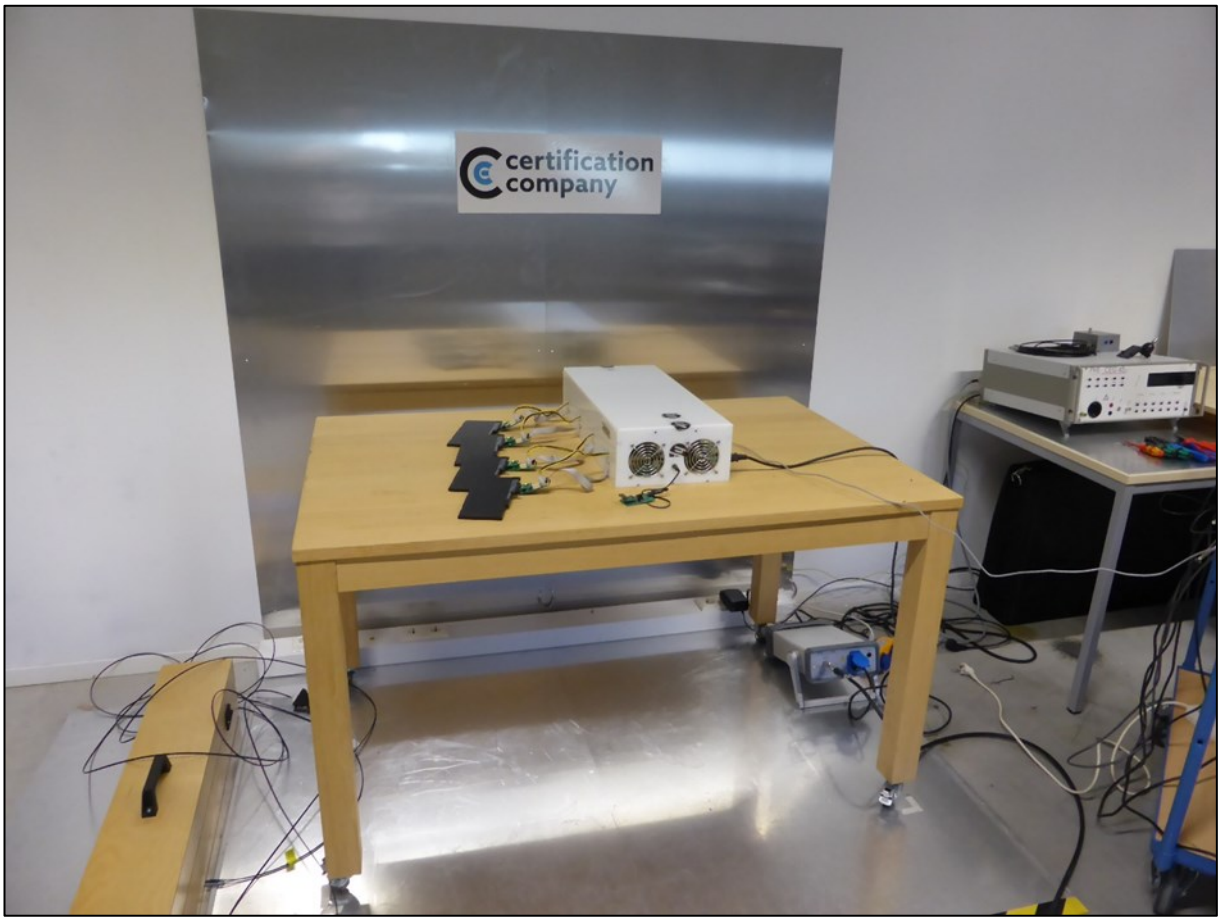


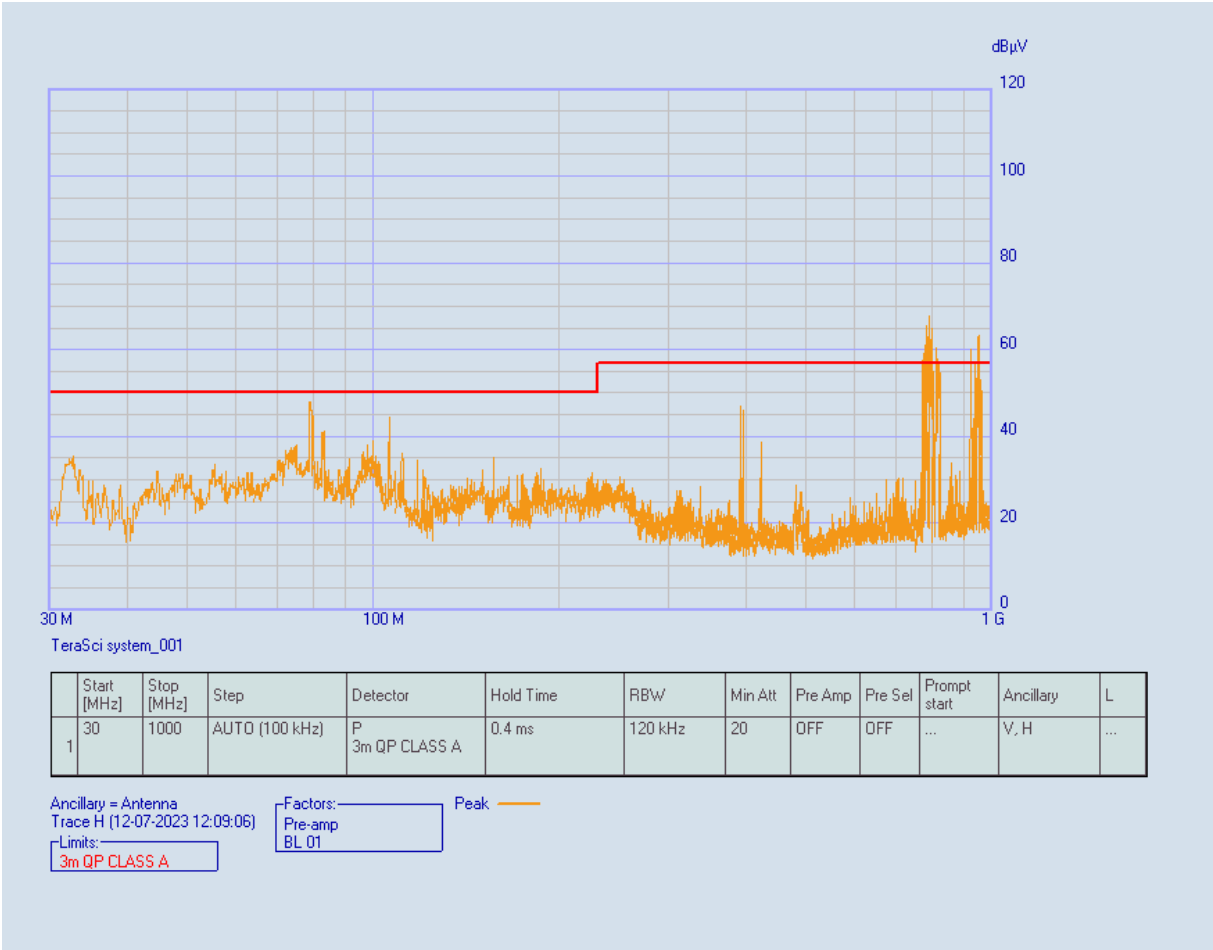
Photo 2 - Test set-up

Used	Description	Type	Manufacturer	ID
√	EMI Receiver	PMM7010	Narda	NC001

3. RADIATED EMISSION RESULTS

Temperature	21 °C	Air pressure	1014 hpa
Humidity	60 %	Frequency steps	
Remark(s):			

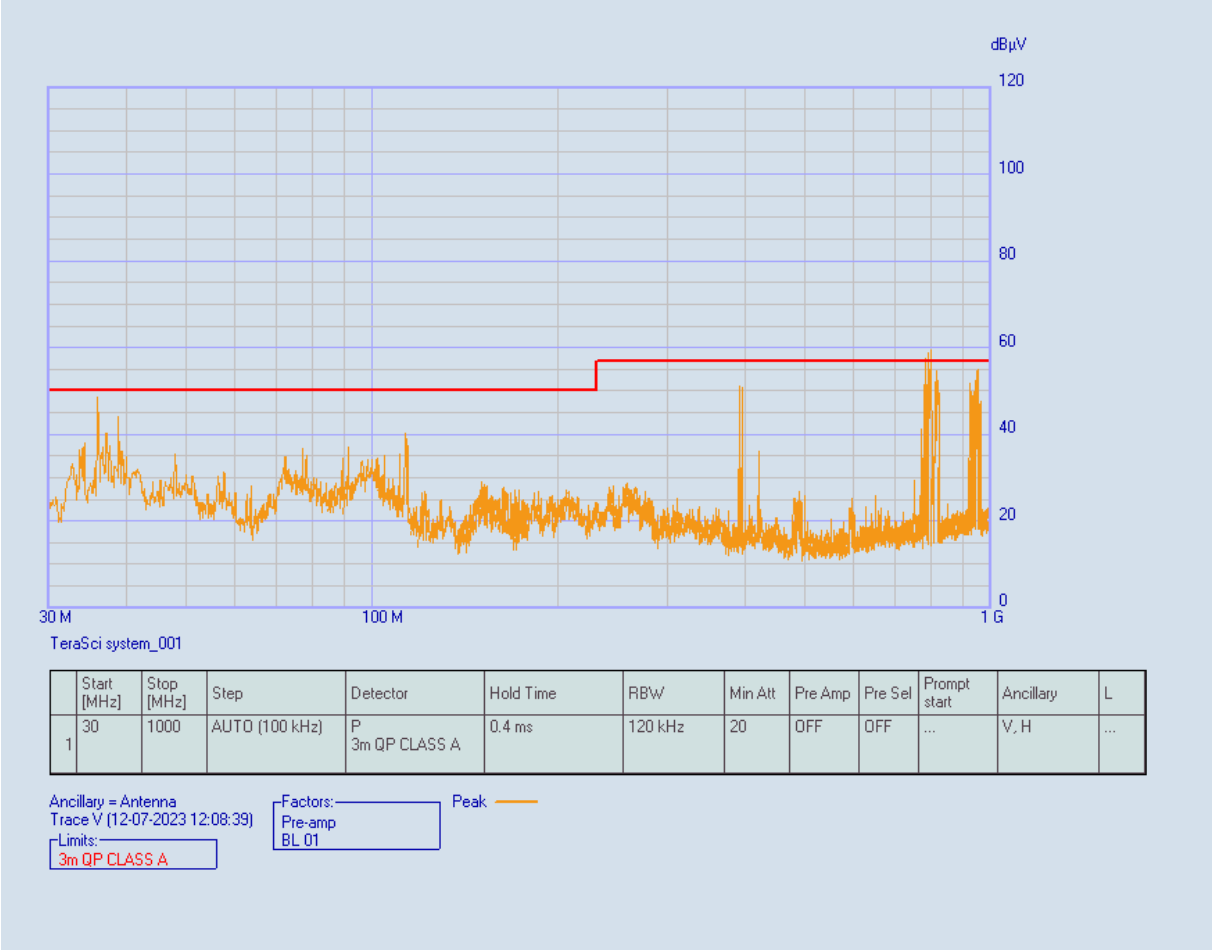
Description	Description: 9) Setting: Frequency band From 30 MHz to 1000 MHz, Class A
Note	Antenna horizontal



Ambient noise due FM(90-100Mhz), C2000 (390MHz), ISM(433MHz) and GSM around 800Mhz and 900 MHz

Detected Peaks									
Peak Number	**Frequency**	**Quasi-Peak**	**Quasi-Peak Limit**	**Quasi-Peak Delta**					**Status**
1	34.3	28.53	50.00	-21.47					**Pass**
2	36	39.17	50.00	-10.83					**Pass**
3	37.2	27.49	50.00	-22.51					**Pass**
4	38.9	24.83	50.00	-25.17					**Pass**
5	78.8	47.29	50.00	-2.71					**Pass**
RESULT	**Pass**								

Description	Description: 9) Setting: Frequency band From 30 MHz to 1000 MHz, Class A
Note	Antenna Vertical



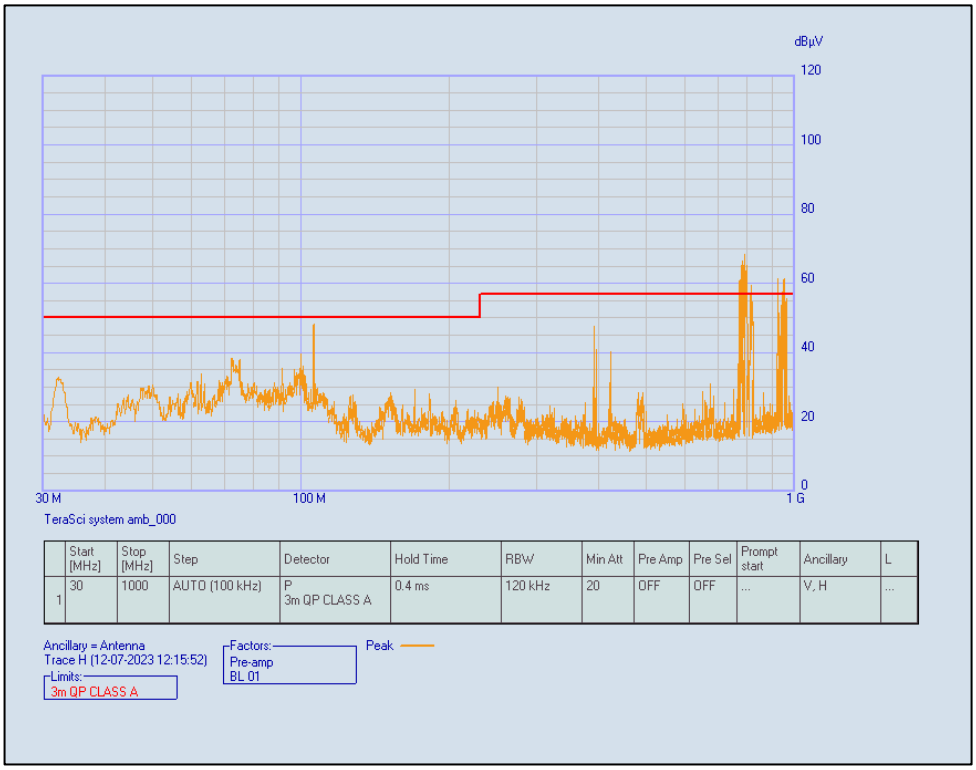
	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary	L
1	30	1000	AUTO (100 kHz)	P 3m QP CLASS A	0.4 ms	120 kHz	20	OFF	OFF	...	V, H	...

Ambient noise due FM(100Mhz), C2000 (390MHz), ISM(420MHz) and GSM around 800Mhz and 900 MHz

Detected Peaks									
Peak Number	**Frequency**	**Quasi-Peak**	**Quasi-Peak Limit**	**Quasi-Peak Delta**					**Status**
1	34.3	31.52	50.00	-18.48					**Pass**
2	36	45.15	50.00	-4.85					**Pass**
3	37.2	38.04	50.00	-11.96					**Pass**
4	38.9	40.50	50.00	-9.50					**Pass**
5	78.8	34.62	50.00	-15.38					**Pass**
RESULT	**Pass**								

Ambient noise:

Horizontal



Vertical

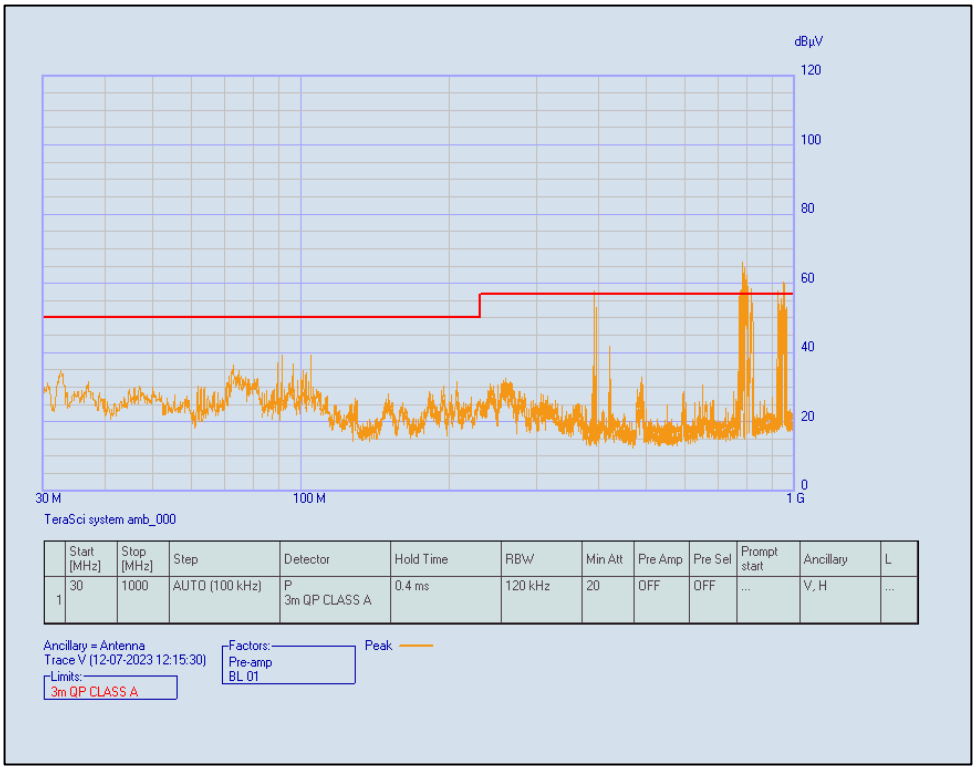


Photo measurement set-up

Photo 3 - Test set-up

Used	Description	Type	Manufacturer	ID
√	EMI Receiver	PMM7010	Narda	NC001
√	Antenna	BL-01	Narda	NC002

4. RADIATED IMMUNITY RESULTS

Temperature	21 °C	**Air pressure**	1014 hpa
Humidity	45 %	**Frequency steps**	2 %
Modulation	1 kHz, 80 % AM	**Frequency range**	80 – 1000 MHz
Dwell time	2 sec.		

Performance criteria: A			
Antenna / EUT position	**Test Level**	**Remarks**	**Pass/Fail**
Horizontal / Vertical	3 V/m	No influence detected	**PASS**
Photo measurement set-up			

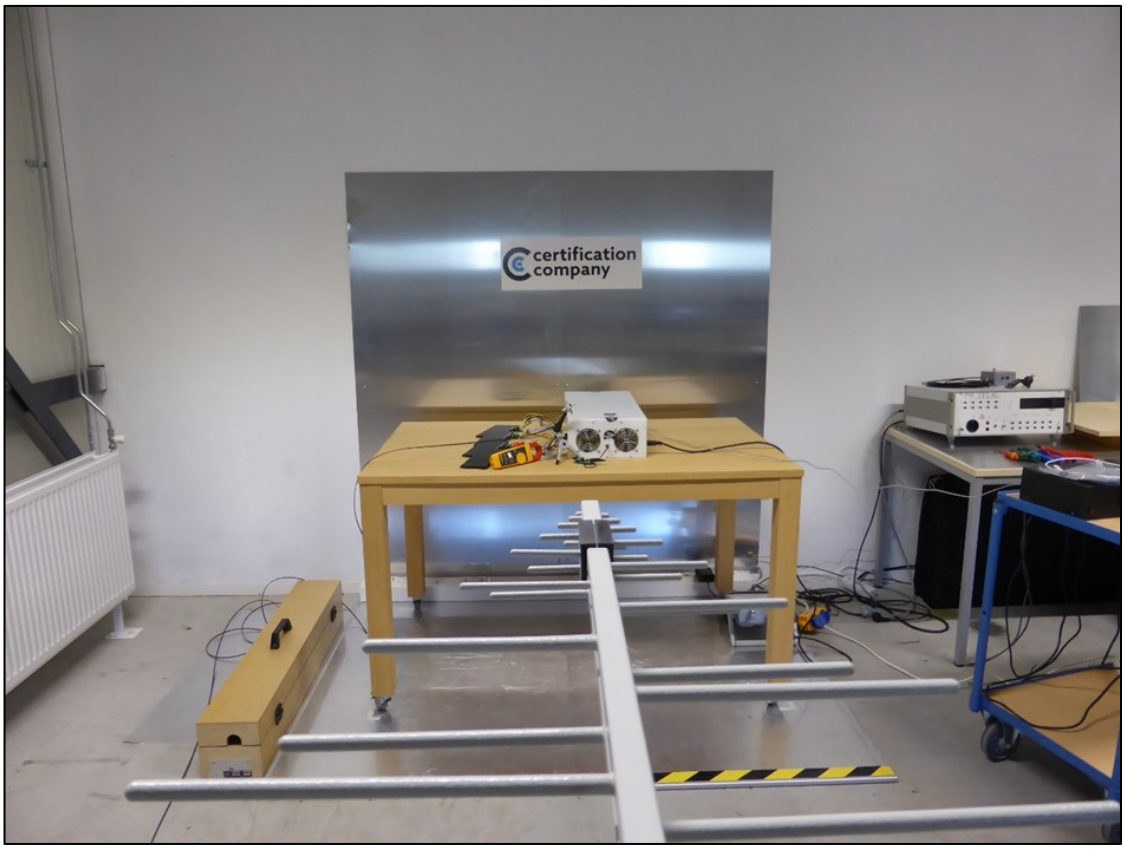


Photo 4 - Test set-up

Used	Description	Type	Manufacturer	ID
√	Signal generator	DSG815	Rigol	NC003
√	Amplifier	ZHL-20W-13	Mini Circuits	NC007
√	Antenna	BL-01	Narda	NC002

5. CONDUCTED IMMUNITY RESULTS

Temperature	21 °C	**Air pressure**	1014 hpa
Humidity	45 %	**Frequency steps**	2 %
Modulation	1 kHz, 80 % AM	**Frequency range**	0.15 – 80 MHz
Dwell time	2 sec.		

Performance criteria: A			
Tested port	**Test Level**	**Remarks**	**Pass/Fail**
AC mains	3 Vrms	No influence detected	**PASS**

Photo measurement set-up

Photo 5 - Test set-up

Used	**Description**	**Type**	**Manufacturer**	**ID**
√	Signal generator	DSG815	Rigol	NC003
√	Amplifier	LZY-22	Mini Circuits	NC006
√	CDN	CDN-16A	EMCMCC	NC015

6. EFT RESULTS

Temperature	21 °C	**Air pressure**	1014 hpa
Humidity	60 %	**Repetition mode**	5 kHz
Burst duration	15 msec	**Burst period**	300 msec

Performance criteria B			
Tested I/O port	**Test level**	**Remarks**	**Pass/Fail**
AC mains	± 1kV L-L	No influence detected	**PASS**

Photo measurement set-up

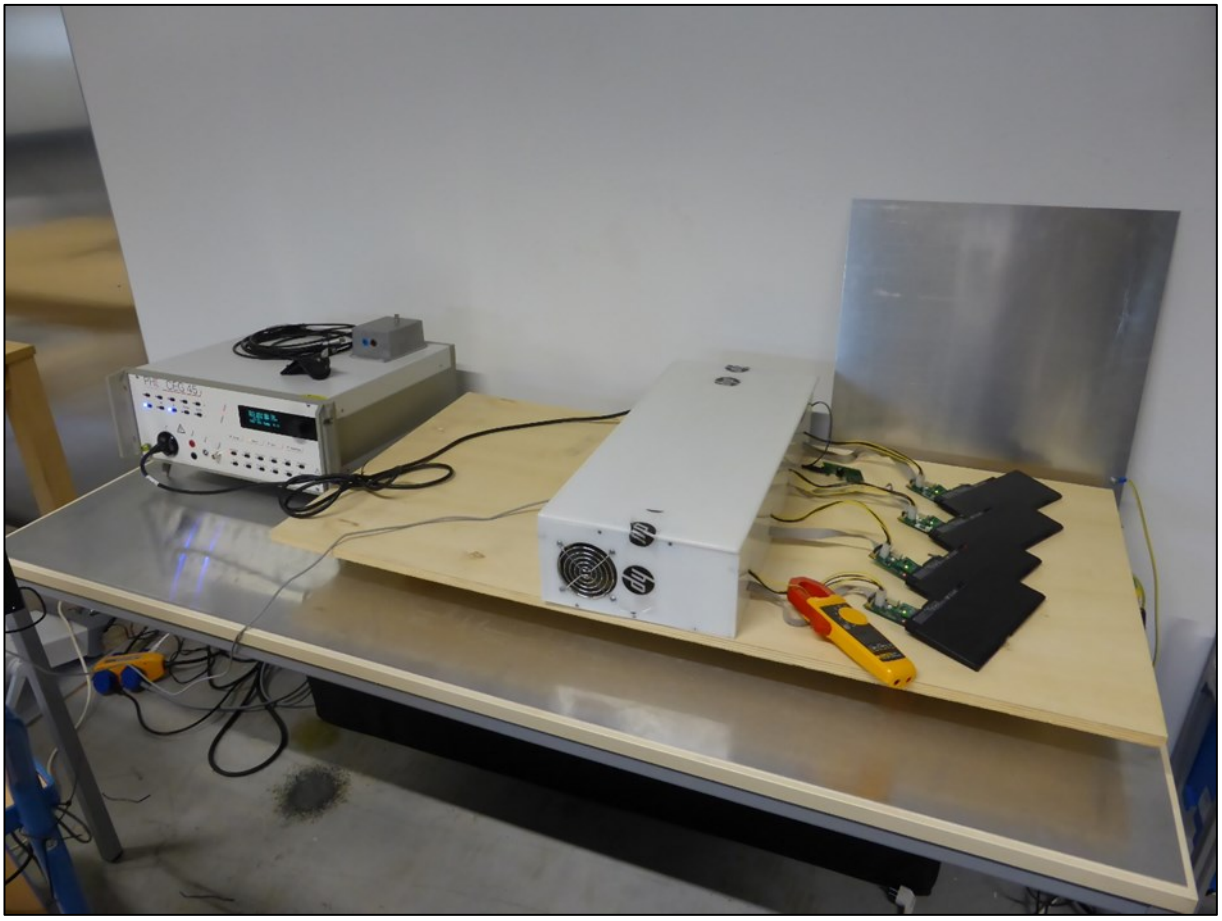


Photo 6 - Test set-up

Used	**Description**	**Type**	**Manufacturer**	**ID**
√	EFT generator	CEG4500	Hofbauer	NC004

7. ESD RESULTS

Temperature	21 °C	Air pressure	1014 hpa
Humidity	60 %	Remarks	---

Performance criteria B			
Indirect contact discharge			
Location of discharge	**Test level**	**Remarks**	**Pass/Fail**
Horizontal coupling plane	± 2-4 kV	No influence detected	**PASS**
Vertical coupling plane	± 2-4 kV	No influence detected	**PASS**
Contact discharge			
Metal parts enclosure (connectors)	± 2-4 kV	No influence detected	**PASS**
Air discharge			
Enclosure/ non-conductive parts(display)	±6-8 kV	No influence detected	**PASS**

Photo measurement set-up

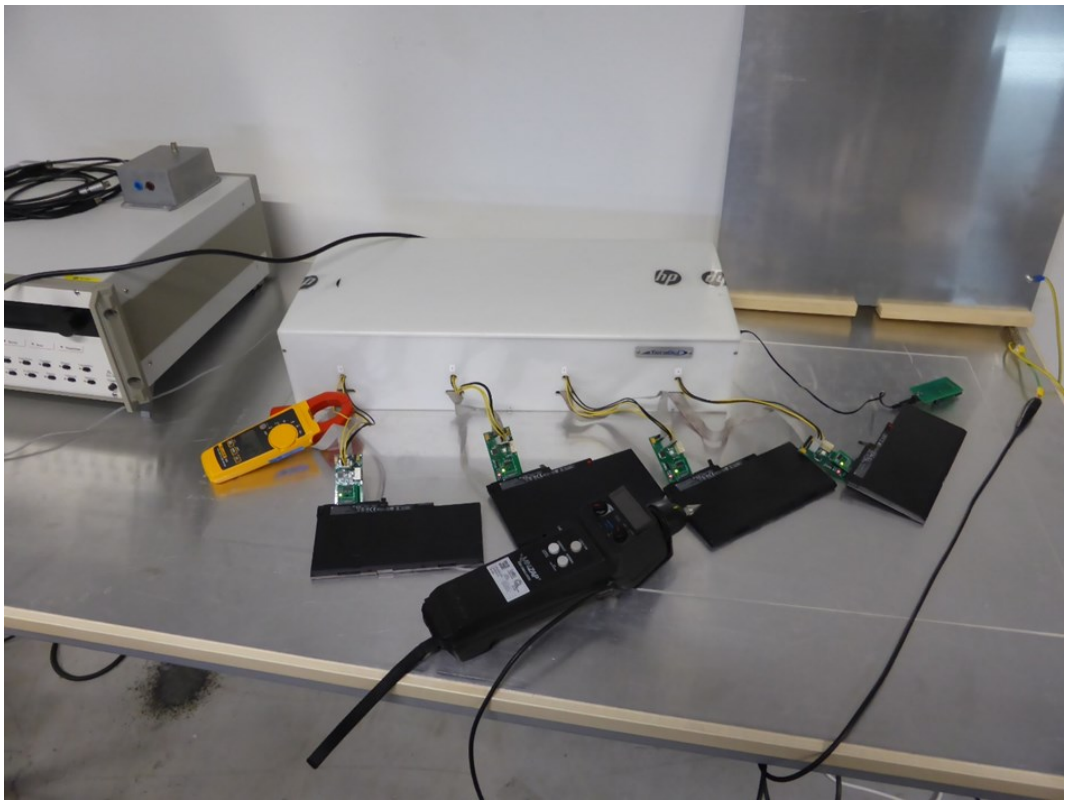


Photo 7 - Test set-up

Used	Description	Type	Manufacturer	ID
√	ESD generator	MiniZap MZ-15	KeyTek	NC-20
√	ESD table	--	--	--
√	Horizontal coupling plane	--	--	--
√	Vertical coupling plane	--	--	--

8. SURGE RESULTS

Temperature:	21 °C	Air pressure:	1014 hpa
Humidity:	60 %	Remarks:	N/A

Performance criteria B			
Tested I/O port	**Test level**	**Remarks**	**Pass/Fail**
AC mains	± 1kV L-L	No influences detected	**PASS**
AC mains	± 2kV L-PE	No influences detected	**PASS**

Photo measurement set-up

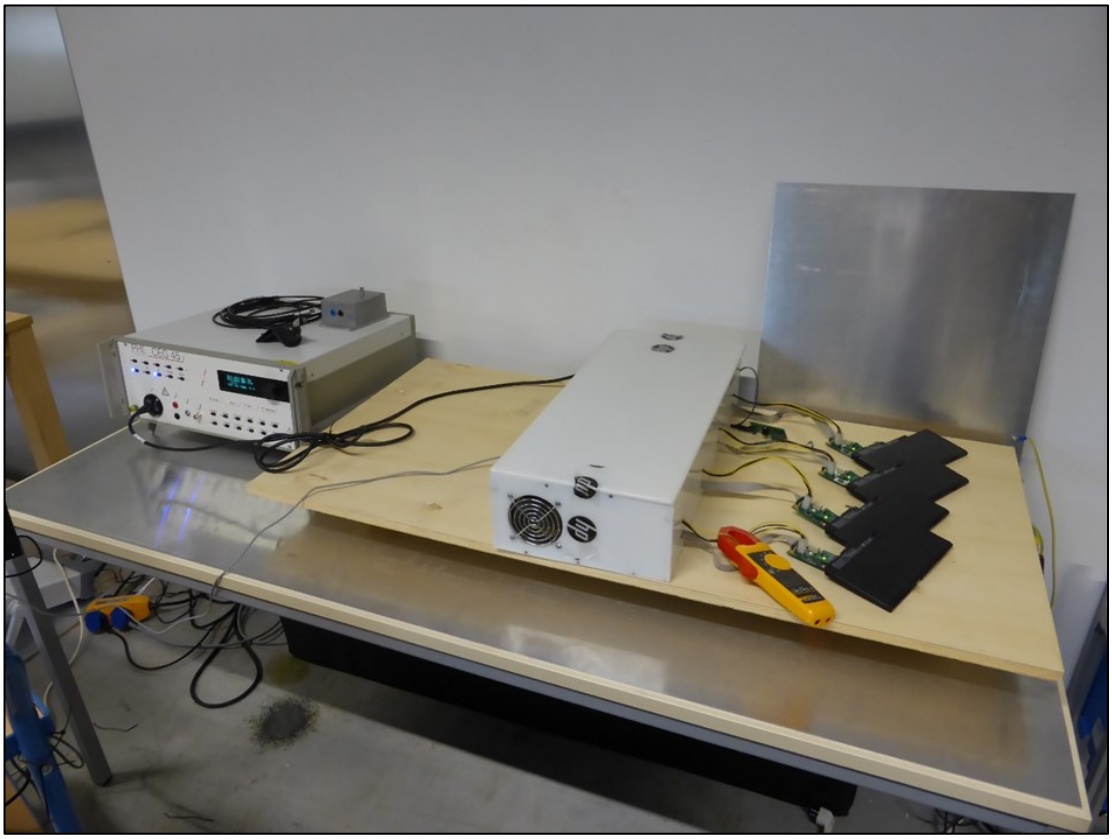


Photo 8 - Test set-up

Used	Description	Type	Manufacturer	ID
√	Surge generator	CEG4500	Hofbauer	NC004

9. POWER DIPS /INTERRUPTS RESULTS

Temperature	21 °C	**Air pressure**	1014 hpa
Humidity	60 %	**Remarks:**	**PASS**

Performance criteria B		
Voltage dip to	**Remarks**	**Pass/Fail**
0%, 1 period	No influences detected	**PASS**
70%, 25 periods	No influences detected	**PASS**

Performance criteria C		
Voltage short interrupt	**Remarks**	**Pass/Fail**
0%, 250periods	EUT restarts correctly after each interrupt, PC connection has to be started up after each interrupt	**PASS**

Photo measurement set-up

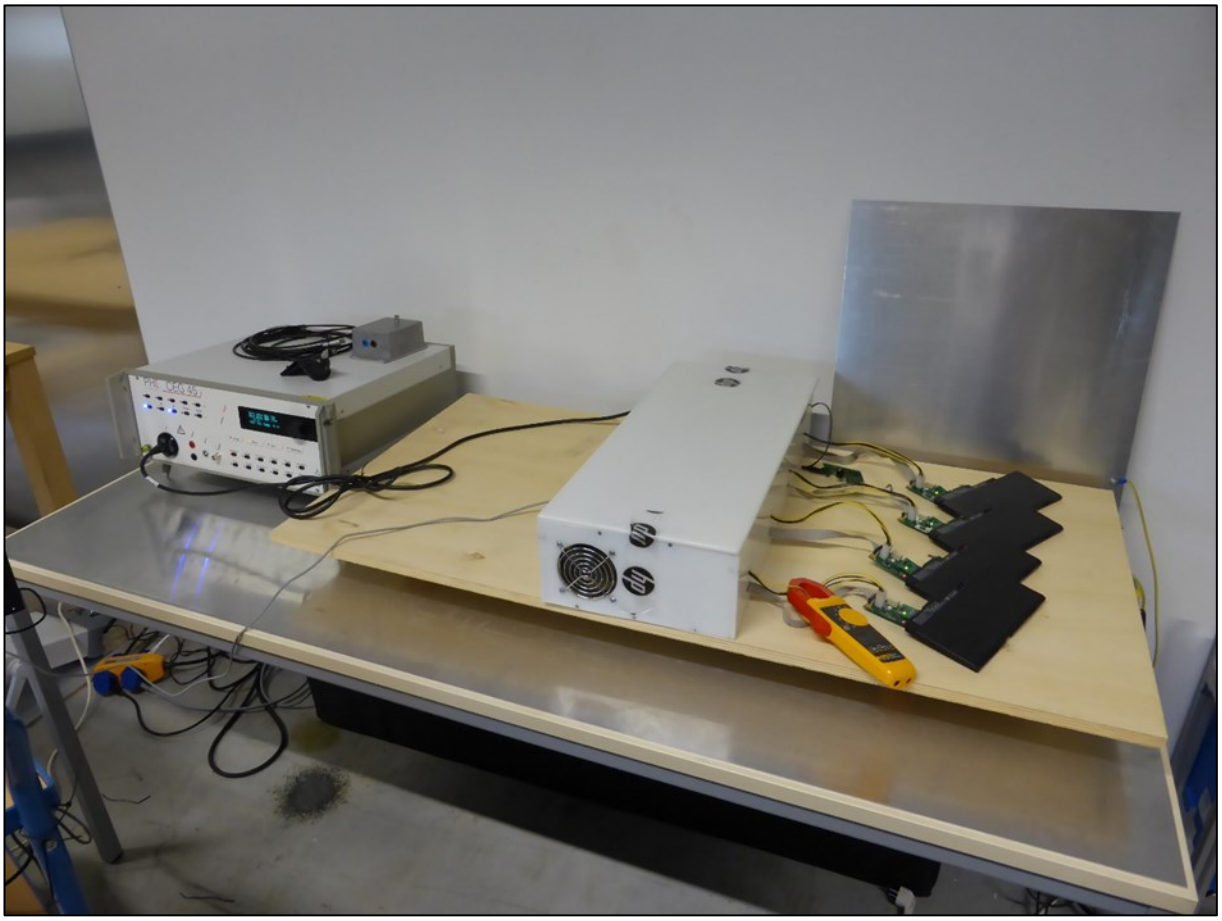


Photo 9 - Test set-up

Used	Description	Type	Manufacturer	ID
√	EFT Generator	CEG4500	Hofbauer	NC004

Conclusion Compliance EMC Directive	**IN COMPLIANCE**

ANNEX IV ROHS ASSESSMENT

In order to verify compliance with the RoHS Directive, Certification Company asked the Applicant to provide a list of (critical) components alongside:

- a Declaration of Conformity and/or,
- a material Declaration and/or,
- analytical test reports/results

from the manufacturer of these components. Insofar, Certification Company possesses a Bill of Materials provided by the Applicant who has to indicate whether this document applies to the Product and whether it can be considered for the RoHS assessment as described in this chapter.

LIST OF COMPONENTS			
OBJECT	**MANUFACTURER**	**TYPE / MODEL**	**DECLARATION OF CONFORMITY OR MATERIAL DECLARATION OR ANALYTICAL TEST REPORT**
1N5822	Semiconductor Components Industries, LLC		**IN COMPLIANCE**
AP7361C-33E-13	Diodes Incorporated		**IN COMPLIANCE**
BQ24725RGRT	Texas Instruments Incorporated		**IN COMPLIANCE**
CDRH125NP-220MC	Sumida Group		**IN COMPLIANCE**
EFM8UB20F64G-A-QFP32R	Silicon Laboratories Inc.		**IN COMPLIANCE**
IRF7205TRPBF	Infineon Technologies		**IN COMPLIANCE**
MBRS340T3G	Semiconductor Components Industries, LLC		**IN COMPLIANCE**
MOCD207R2M	Semiconductor Components Industries, LLC		**IN COMPLIANCE**
RCA12061K00FKEA	VISHAY INTERTECHNOLOGY, INC		**IN COMPLIANCE**
SI2365EDS-T1-GE3	VISHAY INTERTECHNOLOGY, INC		**IN COMPLIANCE**
SI4178DY-T1-GE3	VISHAY INTERTECHNOLOGY, INC		**IN COMPLIANCE**
SML-020MLTT86	ROHM Co., Ltd		**IN COMPLIANCE**

LIST OF COMPONENTS			
OBJECT	**MANUFACTURER**	**TYPE / MODEL**	**DECLARATION OF CONFORMITY OR MATERIAL DECLARATION OR ANALYTICAL TEST REPORT**
SN74HC125D	Texas Instruments Incorporated		**IN COMPLIANCE**
SN74HC166D	Texas Instruments Incorporated		**IN COMPLIANCE**
SN74LS06D	Texas Instruments Incorporated		**IN COMPLIANCE**
TPSC226K025R0400	Kyocera		**IN COMPLIANCE**
TAJD476K010RNJ	Kyocera		**IN COMPLIANCE**
THJA105K025RJN	Kyocera		**IN COMPLIANCE**
10118194-0001LF	Amphenol Communications Solutions		**IN COMPLIANCE**
1-177648-3	TE Connectivity		**IN COMPLIANCE**
PJ-002A	CUI Devices		**IN COMPLIANCE**
LS25-5	TDK-Lambda		**IN COMPLIANCE**
20021521-00010T1LF	Amphenol Communications Solutions		**IN COMPLIANCE**
DF11-16DS-2DSA(05)	Hrose Electric Co., ltd.,		**IN COMPLIANCE**
DF11-16DP-2DSA(24)	Hrose Electric Co., ltd.,		**IN COMPLIANCE**
EE2-3NU	KEMET Electronics Corporation		**IN COMPLIANCE**
NRPN082PAEN-RC	Sullins Connector Solutions		**IN COMPLIANCE**
USB2514BT-I/M2	Microchip Technology Incorporated		**IN COMPLIANCE**
LT3976IMSE#PBF	Linear Technology Corporation		**IN COMPLIANCE**
350211-1	TE Connectivity		**IN COMPLIANCE**
HSA504R0J	TE Connectivity		**IN COMPLIANCE**
39293046	Molex		**IN COMPLIANCE**
5650712-1	TE Connectivity		**IN COMPLIANCE**

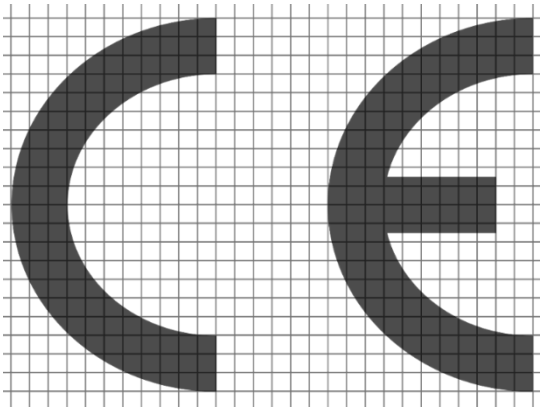
LIST OF COMPONENTS			
OBJECT	**MANUFACTURER**	**TYPE / MODEL**	**DECLARATION OF CONFORMITY OR MATERIAL DECLARATION OR ANALYTICAL TEST REPORT**
FDC645N	Semiconductor Components Industries, LLC		**IN COMPLIANCE**
Remarks:			

Conclusion Compliance RoHS Directive	**IN COMPLIANCE**

ANNEX V GENERAL PRINCIPLES CE MARKING

The following principals are drawn in accordance with Article 30 of the Regulation (EC) No. 765/2008 of the European Parliament and of the council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93.

- The CE marking shall be affixed only by the manufacturer or his authorised representative.
- The CE marking as shown below shall be affixed only to products to which its affixing is provided for by specific Community harmonisation legislation and shall not be affixed to any other product.



- If the CE marking is reduced or enlarged, the proportions given in the graduated drawing above shall be respected.
- Where specific legislation does not impose specific dimensions, the CE marking shall be at least 5 mm high.
- By affixing or having affixed the CE marking, the manufacturer indicates that he takes responsibility for the conformity of the product with all applicable requirements set out in the relevant Community harmonisation legislation providing for its affixing.
- The CE marking shall be the only marking which attests the conformity of the product with the applicable requirements of the relevant Community harmonisation legislation providing for its affixing.
- The affixing to a product of markings, signs or inscriptions which are likely to mislead third parties regarding the meaning or form of the CE marking shall be prohibited. Any other marking may be affixed to the product provided that the visibility, legibility and meaning of the CE marking is not thereby impair.