TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

Nemko North America, Inc.
303 River Road
Ottawa, Ontario, K1V 1H2
Canada

Date of Grant: 05/25/2023

Application Dated: 05/25/2023

Heimdall Power AS
St Olavs gate 28
Oslo, 0166
Norway

Attention: Bent Furevik , Lead Electronic Engineer

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2A9LZ-HPNV4
Name of Grantee: Heimdall Power AS
Equipment Class: **Digital Transmission System**
Notes: **Neuron V4**

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15C	902.3 - 914.9	0.0746		
	15C	903.0 - 914.2	0.0644		
	15C	2402.0 - 2480.0	0.00185		

Power listed is conducted. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other transmitter, except in accordance with FCC multi-transmitter product procedures. End users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Heimdall Power

CE compliance assessment Neuron v4

Report No.: SD-TEC-19

Project/Product Name: Neuron v4

Revision: 1

Date: November 22, 2022

Revision History					
Author	**Title**	**Approver**	**Revision**	**Date**	**Changes**
Øyvind T.	CTO	CTO	1	22-11-2022	First version

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1 Purpose

Assess compliance of v4 related to CE marking. It is Heimdall Power's responsibility to carry out the conformity assessment, set up the technical file, issue the EU declaration of conformity, and affix the CE marking to a product.

2 Scope

All EU directives and harmonised standard are in scope to check that the product meet EU safety, health, and environmental protection requirements. It is the manufacturer's responsibility to carry out the conformity assessment, set up the technical file, issue the EU declaration of conformity, and affix the CE marking to a product. Only then can this product be traded on the EEA market.

3 Applicable EU Directives and Harmonized standards

To assess the applicable directives and standards we first have to define the product, users and the environment it will operate in. The Neuron is an Electrical device with radio transmitters. It is only intended for industrial use. The environment is outdoor use, mounted on a high voltage power line. The climate ranges from cold artic to warm desserts. The neuron is powered and operated with 5V DC. The neuron is made primarily from aluminium and is not flammable or combustible. Once installed it is not accessible by humans as it is only used installed on the phase and ground lines of high voltage power lines.

3.1 EU Directives

List of applicable directives

- Directive 2014/30/EU on electromagnetic compatibility
- Directive 2014/53/EU on Radio Equipment
- Directive for RoHS Restriction of Hazardous Substances in Electrical and Electronic Equipment
- Directive 94/62/EC - Packaging and packaging waste

List of relevant but non applicable directives

- Directive 2014/35/EU on Low Voltage – NA due to operating voltage
- Directive 2006/42/EC on Machinery / NA due to no moving parts
- Directive 2014/32/EU on measuring instruments / NA as neuron is not used for metering quantities for sales

3.2 Harmonized standards

Applicable harmonized standards

- EMC/Radio testing (EU, AUS/NZ, USA/Canada) assessed by Nemko
  - EN 301 489-1 V2.2.3
  - EN 301 489-3 V.2.2.1
  - EN 61000-6-2:2019

  - EN 61000-6-4:2019,
  - EN 61000-6-5:2015/AC:2018.
  - IEC/EN 55032:2015/A1:2020
  - EN 301 908-13 V13.2.1
  - EN 300 220 V3.2.1
  - EN 300 328 V2.2.2
  - FCC Subpart 15B/ICES003
- Safety testing EN 61010-1
  - IEC 60068-2-1:2007
  - IEC 60068-2-2:2007
  - IEC 60068-2-14:2009
  - IEC 60068-2-30:2005
  - IEC 60068-2-52:2017
  - IEC 60068-2-6:2007
  - IEC 60068-2-27:2009
  - MIL 810 – Method 516.7
  - MIL-STD 810, Method 516
  - EN 60529:2013, Ed.2.2
  - IEC 60068-2-13: 2021
- Chemical substances (REACH) Regulation (EC) No 1907/2006

4 Requirement for third party certification (Notified body)

Some directives require use of a Notified body. Heimdall Power have selected Nemko as partner for these.

4.1 Notified body details

- Name: Nemko Scandinavia AS
- Address: Philip Pedersens vei 11, 1366 Lysaker, Norway
- Accreditation: Norsk Akkreditering – TEST 033

4.2 Directives where Nemko is used as Notified body

- Directive 2014/30/EU on electromagnetic compatibility
- Directive 2014/53/EU on Radio Equipment

5 Tests

5.1 Tests by Nemko to demonstrate compliance to EMC and Radio directives

The neuron v4 have passed testing and certification against the EMC and Raio directives.

5.1.1 EU AUZ/NZ Reports from Nemko

- Test report EMC
- Test Report Spurious emission - LTE
- Test Report Spurious emission - LoRaWAN
- Test report for radio equipment – Bluetooth

5.1.2 US/Canada Reports from Nemko

- Test report EMC
- Test Report Spurious emission - LTE
- Test Report Spurious emission - LoRaWAN
- Test report for radio equipment – Bluetooth

5.2 Safety testing EN 61010-1

The purpose of the requirements of this standard is to ensure that hazards to the operator and the surrounding area are reduced to a tolerable level. Then neuron fall under the Fixed Equipment definition: “Equipment fastened to a support, or otherwise secured in a specific location”, ref section 3.1 of EN 61010-1, and is designed with an Enclosure, ref section 3.2 of EN 61010-1.

5.2.1 Environmental conditions

The environmental conditions required in the standard is far exceeded in the Environmental testing carried out at Nemko against standards

- IEC 60068-2-1:2007
- IEC 60068-2-2:2007
- IEC 60068-2-14:2009
- IEC 60068-2-30:2005

5.2.2 Fault conditions -NA

Not applicable as the neuron is permanently installed on a high voltage power line in-accessible by humans.

5.2.3 Marking

The marking can withstand rubbing by hand, without undue pressure, for 30 s with a cloth soaked with each specified cleaning agent (or, if not specified, with 70 % isopropyl alcohol).

5.2.4 Protection against Electrical Shock, NA

Not applicable as the neuron is permanently installed on a high voltage power line inaccessible by humans. No fault modes can result in hazards to operators. The neuron is powered and operates at max 5V.

5.2.5 Protection against mechanical HAZARDS

The neuron has no sharp edges or moving parts that could crush body parts or penetrate the skin. It is permanently mounted before operation, so stability does not apply. Mass is less than 18kg so no provision for carrying is required.

5.2.6 Resistance to mechanical stresses

The neuron is permanently installed on a high voltage power line in-accessible by humans. The following Nemko tests demonstrates resistance to mechanical stresses far exceeding the requirements of this standard:

- IEC 60068-2-6:2007
- IEC 60068-2-27:2009
- MIL 810 – Method 516.7

5.2.7 Protection against the spread of fire , NA

The neuron is made primarily from aluminium and cannot catch fire. The neuron contains a battery which is certified to satisfy UN38.3. Test reports and certificates are stored in row 3 in the Certifications page

5.2.8 Equipment temperature limits and resistance to heat

The neuron is permanently installed on a high voltage power line in-accessible by humans. Skin burns are not possible.

5.2.9 Protection against Hazards from fluids – NA

The neuron contains no fluids.

5.2.10 Protection against radiation, including laser sources, and against sonic and ultrasonic pressure – NA

The neuron does not internally generate ultraviolet, ionizing or microwave radiation; contain laser sources, sonic or ultrasonic pressure.

5.2.11 Protection against liberated gases and substances, explosion, and implosion - NA

The neuron does not contain dangerous amounts of poisonous or injurious gases.

5.2.12 Components and subassemblies

All components and subassemblies are used within their specified ratings.

5.2.13 Protection by interlocks - NA

The neuron is permanently installed on a high voltage power line in-accessible by humans. No interlocks are required.

5.2.14 Hazards resulting from application- NA

The neuron is an industrial product, and no foreseeable misuse has been identified.

5.2.15 Risk assessment

No hazards have been found in the examination above (Section 5.2) which is not addressed by design. Therefor no additional risk assessment is needed.

5.3 Degrees of protection provided by enclosures (IP Code)

The neuron has been tested for IP code at Nemko according to standard EN 60529:2013, Ed.2.2 and found to pass IP 66.

5.4 Low air pressure

The neuron has been tested at low air pressure to ensure it can be safely transported by non-pressurized cargo planes according to IEC 60068-2-13: 2021

6 Compliance assessments

6.1 Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS)

The Neuron v4 conform to the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2) and the EU Directive 2015/863/EU (RoHS3).

6.2 Packaging and packaging waste

The packaging material for Neuron v4 is pure cardboard and is compliant with Directive 94/62/EC - Packaging and packaging waste.

The packing material is FSC labelled and made from mixture of materials from FSC-certified forests, recycled materials, and/or FSC-controlled wood. The FSC registration number is FSC C114369.

6.3 Chemical substances (REACH)

The Neuron v4 is REACH compliant, by conforming to EU chemicals regulation (EC) No. 1907/2006 concerning Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), and do not contain any substances found on the REACH SVHC (Substance of Very High Concern) list and Annex XIV (authorization list). We comply to all consequent restriction conditions for substances from Annex XVII (REACH restricted substances list).

7 Summary

The Neuron v4 is in conformity with the relevant Union harmonisation legislation and can be CE marked.

8 References

- EMC test report
- Radio test report
- Environmental test reports
- RoHS Compliance Statement
- REACH Compliance Statement
- EU Declaration of Conformity form