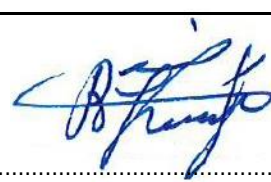


| <b>RF-EXPOSURE REPORT</b><br><b>FCC 47 CFR Part 2.1091</b><br><b>Maximum permissible exposure</b> |                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Report Reference No</b>                                                                        | G0M-2401-2383-TFC091MP-V02                                                                                                                                                                                                           |
| <b>Testing Laboratory</b>                                                                         | Eurofins Product Service GmbH                                                                                                                                                                                                        |
| <b>Address</b>                                                                                    | Storkower Str. 38c<br>15526 Reichenwalde<br>Germany                                                                                                                                                                                  |
| <b>Accreditation</b>                                                                              | <br>A2LA Accredited Testing Laboratory, Certificate No.: 1983.01<br>FCC Test Firm Designation Number: DE0008<br>ISED Testing Laboratory site: 3470A |
| <b>Applicant</b>                                                                                  | Haltian Oy                                                                                                                                                                                                                           |
| <b>Address</b>                                                                                    | Yrttipellontie 1 D<br>90230 Oulu<br>Finland                                                                                                                                                                                          |
| <b>Test Specification</b>                                                                         | According to FCC rules                                                                                                                                                                                                               |
| <b>Standard</b>                                                                                   | FCC 47 CFR 2.1091                                                                                                                                                                                                                    |
| <b>Non-Standard Test Method</b>                                                                   | None                                                                                                                                                                                                                                 |
| <b>Equipment under Test (EUT):</b>                                                                |                                                                                                                                                                                                                                      |
| <b>Product Description</b>                                                                        | Haltian RADAR senses warehouse loading dock or parking slot occupancy status and sends this information via Wirepas mesh network to Thingsee Gateway and from there to Cloud.                                                        |
| <b>Model(s)</b>                                                                                   | DRA                                                                                                                                                                                                                                  |
| <b>Additional Model(s)</b>                                                                        | None                                                                                                                                                                                                                                 |
| <b>Brand Name(s)</b>                                                                              | Haltian RADAR                                                                                                                                                                                                                        |
| <b>Hardware Version(s)</b>                                                                        | DRA_03                                                                                                                                                                                                                               |
| <b>Software Version(s)</b>                                                                        | 2023_11_17                                                                                                                                                                                                                           |
| <b>FCC-ID</b>                                                                                     | 2AEU3HARADAR                                                                                                                                                                                                                         |
| <b>Test Result</b>                                                                                | <b>PASSED</b>                                                                                                                                                                                                                        |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------|
| <b>Possible test case verdicts:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |                                                                                                |
| required by standard but not tested                                                                                                                                                                                                                                                                                                                                                                                                                                                          | N/T             |                                                                                                |
| not required by standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | N/R             |                                                                                                |
| test object does meet the requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                        | P(PASS)         |                                                                                                |
| test object does not meet the requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                    | F(FAIL)         |                                                                                                |
| <b>Testing:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                                                                                                |
| Test Lab Temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20 °C - 30 °C   |                                                                                                |
| Test Lab Humidity                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 25 % - 55 %     |                                                                                                |
| Date of performance                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2024-04-05      |                                                                                                |
| Date of receipt of test item                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2024-01-09      |                                                                                                |
| <b>Report:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |                                                                                                |
| Compiled by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Burkhard Pudell |                                                                                                |
| Tested by (+ signature)<br>(Responsible for Test)                                                                                                                                                                                                                                                                                                                                                                                                                                            | Burkhard Pudell | <br>.....  |
| Approved by (+ signature)<br>(Test Lab Engineer)                                                                                                                                                                                                                                                                                                                                                                                                                                             | Radwan Jaafar   | <br>..... |
| Date of Issue                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2024-05-29      |                                                                                                |
| Total number of pages                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 13              |                                                                                                |
| <b>General Remarks:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |                                                                                                |
| <p><b>The test results presented in this report relate only to the object tested.</b></p> <p><b>The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.</b></p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p> |                 |                                                                                                |
| <b>Additional Comments:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |                                                                                                |
| --                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                 |                                                                                                |

## VERSION HISTORY

| Version History |            |                                                                                                                                                                                            |             |
|-----------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Version         | Issue Date | Remarks                                                                                                                                                                                    | Revised By  |
| 01              | 2024-04-09 | Initial Release                                                                                                                                                                            | --          |
| 02              | 2024-05-29 | Replaced document: G0M-2401-2383-TFC091MP-V01<br>Replaced by: G0M-2401-2383-TFC091MP-V02<br><br>Changes:<br>Page 9 / 13: <ul style="list-style-type: none"> <li>Mode correction</li> </ul> | St. Liebich |

## ABBREVIATIONS AND ACRONYMS

| Acronyms |                                     |
|----------|-------------------------------------|
| Acronym  | Description                         |
| EIRP     | Equivalent Isotropic Radiated Power |
| EUT      | Equipment Under Test                |
| MPE      | Maximum Permissible Exposure        |

## REPORT INDEX

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## 1 Equipment (Test Item) Under Test

|                       |                                                                                                                                                                               |             |               |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|
| Description           | Haltian RADAR senses warehouse loading dock or parking slot occupancy status and sends this information via Wirepas mesh network to Thingsee Gateway and from there to Cloud. |             |               |
| Model                 | DRA                                                                                                                                                                           |             |               |
| Additional Model(s)   | None                                                                                                                                                                          |             |               |
| Brand Name(s)         | Haltian RADAR                                                                                                                                                                 |             |               |
| Sample Identification | EUT #                                                                                                                                                                         | Sample-ID   | Serial Number |
|                       | EUT 1                                                                                                                                                                         | See Ref-Doc | See Ref-Doc   |
| Hardware Version(s)   | DRA_03                                                                                                                                                                        |             |               |
| Software Version(s)   | 2023_11_17                                                                                                                                                                    |             |               |
| FCC ID                | 2AEU3HARADAR                                                                                                                                                                  |             |               |
| Equipment type        | End Product                                                                                                                                                                   |             |               |
| Environment           | Workers                                                                                                                                                                       |             |               |

### 1.1 Reference Documents

| Document Type | Document No.  | Issued by                                  | Date       |
|---------------|---------------|--------------------------------------------|------------|
| Test-Report   | 3897RER004    | Eurofins Electric & Electronics Finland Oy | 2024-03-18 |
| Test-Report   | USRC23D128001 | Eurofins E&E Wireless Taiwan Co., Ltd.     | 2024-01-17 |

## 1.2 Power density radiation sources

| Mode         | Operating Frequency [MHz] | Maximum conducted power [dBm] | Maximum radiated power [dBm EIRP] | Maximum duty cycle [%] | Maximum antenna gain [dBi] | Maximum antenna diameter [cm] |
|--------------|---------------------------|-------------------------------|-----------------------------------|------------------------|----------------------------|-------------------------------|
| Bluetooth LE | 2402                      | -1.00                         | 0.75                              | 100                    | 1.75                       | N/A                           |
| Radar        | 60500                     | -27.07                        | -5.67                             | 3.7                    | 21.4                       | N/A                           |
| Comment: --  |                           |                               |                                   |                        |                            |                               |

## 1.3 Field strength radiation sources

None

## 1.4 Concurrent Sources

No concurrent radiation sources

## 2 Result Summary

| FCC MPE Evaluation - Single radiation sources |                              |                  |              |              |         |
|-----------------------------------------------|------------------------------|------------------|--------------|--------------|---------|
| Product Standard Reference                    | Requirement                  | Reference Method | Mode         | Distance [m] | Verdict |
| 47 CFR 2.1091                                 | Maximum permissible exposure | FCC KDB 447498   | Bluetooth LE | 0.20         | PASS    |
| 47 CFR 2.1091                                 | Maximum permissible exposure | FCC KDB 447498   | Radar        | 0.20         | PASS    |
| Comment: --                                   |                              |                  |              |              |         |

### 3 RF-Exposure classification

| RF-Exposure Categories |                                                                                                                                                                                                                                                                                                                        |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fixed                  | A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located.                                                                                                                                                                                                        |
| Mobile                 | A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. |
| Portable               | A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.                                                                                                                                       |

| RF-Exposure Categories            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Occupational / Controlled         | Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure. |
| General population / Uncontrolled | Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.                                                                                                                                                                                           |

#### 4 RF-Exposure limits

| FCC Limits – General Population / Uncontrolled Exposure |                               |                               |                                   |                      |
|---------------------------------------------------------|-------------------------------|-------------------------------|-----------------------------------|----------------------|
| Frequency range [MHz]                                   | Electric field strength [V/M] | Magnetic field strength [A/M] | Power density [W/m <sup>2</sup> ] | Averaging time [min] |
| 0.3 – 1.34                                              | 614                           | 1.63                          | 1000                              | 30                   |
| 1.34 – 30                                               | 824/f                         | 2.19/f                        | 1800/f <sup>2</sup>               | 30                   |
| 30 – 300                                                | 27.5                          | 0.073                         | 2                                 | 30                   |
| 300 – 1500                                              | -                             | -                             | f/150                             | 30                   |
| 1500 – 100000                                           | -                             | -                             | 10.0                              | 30                   |

| FCC Limits – Occupational / Controlled Exposure |                               |                               |                                   |                      |
|-------------------------------------------------|-------------------------------|-------------------------------|-----------------------------------|----------------------|
| Frequency range [MHz]                           | Electric field strength [V/M] | Magnetic field strength [A/M] | Power density [W/m <sup>2</sup> ] | Averaging time [min] |
| 0.3 – 3.0                                       | 614                           | 1.63                          | 1000                              | 6                    |
| 3.0 – 30                                        | 1842/f                        | 4.89/f                        | 9000/f <sup>2</sup>               | 6                    |
| 30 – 300                                        | 61.4                          | 0.163                         | 10.0                              | 6                    |
| 300 – 1500                                      | -                             | -                             | f/30                              | 6                    |
| 1500 – 100000                                   | -                             | -                             | 50                                | 6                    |

## 5 RF-Exposure Evaluation

| Evaluation Relations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\lambda[m] = \frac{c \left[ \frac{m}{s} \right]}{f[Hz]} ; R_{FF}[m] \geq \frac{2 \cdot D[m]^2}{\lambda[m]}$ $S[W/m^2] = \frac{P_{E.I.R.P.}[W]}{4\pi R[m]^2} ; R[m] = \sqrt{\frac{P_{E.I.R.P.}[W]}{4\pi S[W/m^2]}}$ $DCC [dB] = 10 \cdot \log_{10} \left( \frac{DC[\%]}{100} \right)$ $\sum_{i=1}^N \frac{S_i \left[ \frac{W}{m^2} \right]}{S_{Li} \left[ \frac{W}{m^2} \right]} + \sum_{j=1}^M \left( \frac{E_j \left[ \frac{V}{m} \right]}{E_{Lj} \left[ \frac{V}{m} \right]} \right)^2 + \sum_{k=1}^O \left( \frac{H_k \left[ \frac{A}{m} \right]}{H_{Lk} \left[ \frac{A}{m} \right]} \right)^2 < 1$ |

| Evaluation Procedure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><u>Standalone operation evaluation:</u></p> <p>For each radio and frequency band the worst case transmission mode with the highest peak conducted or radiated power is evaluated at the frequency that results in the most restrictive rf-exposure limit. From the peak power values, antenna gains and duty cycles taken from the reference documents, the source average radiated power values are calculated. From the average radiated power the power densities at antenna far-field distance is calculated. The distance from the radiation source for compliance power density is calculated. If the separation distance is lower than the far-field distance, the far-field distance is given as compliance separation distance because the plane wave power density assessment is only valid in the far-field of the radiation source.</p> <p>For radiation sources for which the average electric and magnetic fields are measured using field probes, the measured field strength values are compared to the reference limits. For those sources no calculations are performed. Compliance with the reference values is determined with the near field measurements.</p> <p><u>Concurrent operation evaluation:</u></p> <p>First the evaluation distance is set to an appropriate value. For all radiation sources for which power densities are calculated, the power densities at the evaluation distance are calculated and for all other sources the electric or magnetic field strengths are measured using field probes. Finally the ratios of the power densities and/or field strength values and the corresponding limits are calculated and summed and the sum is compared to the maximum of 1.</p> |

## 6 Single Source Evaluation Results - FCC

| Bluetooth LE                                                       |        |
|--------------------------------------------------------------------|--------|
| <b>Transmission Mode</b>                                           |        |
| Transmission Frequency (f) [MHz]                                   | 2402   |
| <b>Antenna far-field distance</b>                                  |        |
| Maximum antenna diameter (D) [m]                                   | N/A    |
| Transmission wavelength ( $\lambda$ ) [m]                          | N/A    |
| Antenna far-field distance ( $R_{FF}$ ) [m]                        | N/A    |
| <b>Source average power</b>                                        |        |
| Peak radiated power (PR) [dBm EIRP]                                | 0.75   |
| Maximum transmission duty cycle (DC)                               | 1.00   |
| Duty cycle correction (DCC) [dB]                                   | 0.00   |
| Average radiated power (PRAVG) [dBm EIRP]                          | 0.75   |
| <b>Power density</b>                                               |        |
| Compliance power density limit [W/m <sup>2</sup> ]                 | 50.000 |
| Power density (S) @ Antenna far-field distance [W/m <sup>2</sup> ] | N/A    |
| Power density (S) @ 0.20 m [W/m <sup>2</sup> ]                     | 0.002  |
| Power density ratio @ 0.20 m                                       | 0.00   |
| Distance for compliance power density (S=SL) [m]                   | 0.001  |
| <b>Compliance</b>                                                  |        |
| Verdict                                                            | PASS   |
| Comment:                                                           |        |

| Radar                                                              |        |
|--------------------------------------------------------------------|--------|
| <b>Transmission Mode</b>                                           |        |
| Transmission Frequency (f) [MHz]                                   | 60500  |
| <b>Antenna far-field distance</b>                                  |        |
| Maximum antenna diameter (D) [m]                                   | N/A    |
| Transmission wavelength ( $\lambda$ ) [m]                          | N/A    |
| Antenna far-field distance ( $R_{FF}$ ) [m]                        | N/A    |
| <b>Source average power</b>                                        |        |
| Peak radiated power (PR) [dBm EIRP]                                | -5.67  |
| Maximum transmission duty cycle (DC)                               | 0.04   |
| Duty cycle correction (DCC) [dB]                                   | -14.32 |
| Average radiated power (PRAVG) [dBm EIRP]                          | -19.99 |
| <b>Power density</b>                                               |        |
| Compliance power density limit [W/m <sup>2</sup> ]                 | 50.000 |
| Power density (S) @ Antenna far-field distance [W/m <sup>2</sup> ] | N/A    |
| Power density (S) @ 0.20 m [W/m <sup>2</sup> ]                     | 0.000  |
| Power density ratio @ 0.20 m                                       | 0.00   |
| Distance for compliance power density (S=SL) [m]                   | 0.000  |
| <b>Compliance</b>                                                  |        |
| Verdict                                                            | PASS   |
| Comment:                                                           |        |

== = END OF TEST REPORT == =