

# Exposure Test Report

Sepura Limited

TETRA mobile radio, Model: SCG2221

In accordance with FCC CFR 47 Part 1.1310

Prepared for: Sepura Limited  
9000 Cambridge Research Park  
Beach Drive, Waterbeach  
Cambridge, CB25 9TL  
United Kingdom

FCC ID: XX6SCG2221M

## COMMERCIAL-IN-CONFIDENCE

Document Number: 75956225-08 | Issue: 02



Add value.  
Inspire trust.

### SIGNATURE

| NAME            | JOB TITLE           | RESPONSIBLE FOR      | ISSUE DATE    |
|-----------------|---------------------|----------------------|---------------|
| Matthew Russell | Chief Engineer (RF) | Authorised Signatory | 25 April 2023 |

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

FCC Accreditation  
90987 Octagon House, Fareham Test Laboratory

### EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC CFR 47 Part 1.1310: 2021 at a minimum distance of 40 cm with time averaging of 6 minutes. If alternative antennas are used with greater gains, the exposure must be retested.



#### DISCLAIMER AND COPYRIGHT

This non-binding report has been prepared by TÜV SÜD with all reasonable skill and care. The document is confidential to the potential Client and TÜV SÜD. No part of this document may be reproduced without the prior written approval of TÜV SÜD. © 2023 TÜV SÜD. This report relates only to the actual item/items tested.

#### ACCREDITATION

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

TÜV SÜD  
is a trading name of TÜV SÜD Ltd  
Registered in Scotland at East Kilbride,  
Glasgow G75 0QF, United Kingdom  
Registered number: SC215164

TÜV SÜD Ltd is a  
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100  
Fax: +44 (0) 1489 558101  
[www.tuv-sud.co.uk](http://www.tuv-sud.co.uk)

TÜV SÜD  
Octagon House  
Concorde Way  
Fareham  
Hampshire PO15 5RL  
United Kingdom

TÜV SÜD

TÜV®



# Contents

|          |                                                   |          |
|----------|---------------------------------------------------|----------|
| <b>1</b> | <b>Report Summary .....</b>                       | <b>2</b> |
| 1.1      | Report Modification Record.....                   | 2        |
| 1.2      | Introduction.....                                 | 2        |
| 1.3      | Brief Summary of Results .....                    | 3        |
| 1.4      | Manufacturer's Declared Variants .....            | 4        |
| 1.5      | Product Information .....                         | 5        |
| 1.6      | Deviations from the Standard.....                 | 6        |
| 1.7      | EUT Modification Record .....                     | 6        |
| 1.8      | Test Location .....                               | 6        |
| <b>2</b> | <b>Test Details .....</b>                         | <b>7</b> |
| 2.1      | Measurement of Electric and Magnetic Fields ..... | 7        |
| 2.2      | Measurement Uncertainty .....                     | 16       |



# 1 Report Summary

## 1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

| Issue | Description of Change               | Date of Issue |
|-------|-------------------------------------|---------------|
| 1     | First Issue                         | 08-March-2023 |
| 2     | Add Manufacturers declared variants | 25-April-2023 |

**Table 1 – Report Status**

## 1.2 Introduction

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant                     | Sepura Limited                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Manufacturer                  | Sepura Limited                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Model Number(s)               | SCG2221                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Serial Number(s)              | 1PR002230GP58OM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Hardware Version(s)           | B Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Software Version(s)           | 1807 007 10138                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Number of Samples Tested      | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Test Specification/Issue/Date | FCC 47 CFR Part 1, Clause 1.1310: 2021 Radiofrequency radiation exposure limits                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Order Number                  | PLC-PO024881-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Date                          | 31-January-2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Date of Receipt of EUT        | 07-November-2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Start of Test                 | 06-February-2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Finish of Test                | 09-February-2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Name of Engineer(s)           | Ravish Foolchund                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Related Document(s)           | FCC 47 CFR Part 1, Clause 1.1307(b): 2021 Requirements (human exposure to RF)<br>OET65:97 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.<br>IEEE C95.1:2005 IEEE Standard for Safety Levels with Respect to Human Exposure to radio Frequency Electromagnetic Fields, 3 kHz to 300 kHz.<br>IEEE C95.3:2002 IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz–300 GHz. |



### 1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 1.1310 is shown below.

| Section                                                                                                                                                        | Specification Clause | Test Description                                    | Result | Comments/Base Standard |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------|--------|------------------------|
| Configuration and Mode: TETRA operating frequency 136 -174MHz, supports Bluetooth and 2.4GHz WLAN, simultaneous transmission either TETRA + WLAN or TETRA + BT |                      |                                                     |        |                        |
| 2.1                                                                                                                                                            | 1.1310 Table 1       | Measurement of Electric and Magnetic field exposure | Pass   | OET Bulletin 65        |

**Table 2 – Test Summary**



## 1.4 Manufacturer's Declared Variants

The following information was provided by the manufacturer:

### General Information

The SCG2221 is a TETRA mobile radio in the SCG22 series of radios, operating in the VHF band, with TETRA operating frequencies 136-174 MHz. The SCG2221 supports GNSS and optionally Bluetooth, Bluetooth LE, WLAN at 2.4 GHz and a range of accessories and ancillary equipment.

### SCG2221 Basic

The SCG2221 Basic is a TETRA mobile radio in the SCG22 series of radios, operating in the VHF band, with TETRA operating frequencies 136-174 MHz. The SCG2221 Basic also supports GNSS. It has a single console interface and a USB/IO/Loudspeaker interface.

The SCG2221 Basic has the following identification for North America:

FCC ID: XX6SCG2221X

IC ID: 8739A-SCG2221X

### SCG2221 Standard

The SCG2221 Standard is a TETRA mobile radio in the SCG22 series of radios, operating in the VHF band, with TETRA operating frequencies 136-174 MHz. The SCG2221 Standard also supports GNSS and has a 2.4 GHz Bluetooth/Bluetooth-LE/WLAN interface. It has a single console interface and a USB/IO/Loudspeaker interface.

The SCG2221 Standard has the following identification for North America:

FCC ID: XX6SCG2221M

IC ID: 8739A-SCG2221M

### SCG2221 Premium

The SCG2221 Premium is a TETRA mobile radio in the SCG22 series of radios, operating in the VHF band, with TETRA operating frequencies 136-174 MHz. The SCG2221 Premium also supports GNSS and has a 2.4 GHz Bluetooth/Bluetooth-LE/WLAN interface. It has front and rear console interfaces, a USB/IO/Loudspeaker interface, a Loudspeaker/Multi-IO interface and a PoE interface.

The SCG2221 Premium has the following identification for North America:

FCC ID: XX6SCG2221M

IC ID: 8739A-SCG2221ME

## 1.5 Product Information

### 1.5.1 Technical Description

The SCG2221 is a TETRA mobile radio in the SCG22 series of radios, operating in the VHF band, with TETRA operating frequencies 136-174 MHz. The SCG2221 supports GNSS, Bluetooth, Bluetooth LE, WLAN at 2.4 GHz and a range of accessories and ancillary equipment.

### 1.5.2 Device Under Test



Figure 1 – Front View



Figure 2 – Rear View



## 1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

## 1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

| Modification State | Description of Modification still fitted to EUT | Modification Fitted By | Date Modification Fitted |
|--------------------|-------------------------------------------------|------------------------|--------------------------|
| 0                  | As supplied by the customer                     | Not Applicable         | Not Applicable           |

**Table 3 – EUT Modification Record**

## 1.8 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

| Test Name                                                                                                                                                      | Name of Engineer(s) | Accreditation |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------|
| Configuration and Mode: TETRA operating frequency 136 -174MHz, supports Bluetooth and 2.4GHz WLAN, simultaneous transmission either TETRA + WLAN or TETRA + BT |                     |               |
| Measurement of Electric and Magnetic Field Exposure                                                                                                            | Ravish Foolchund    | UKAS          |

**Table 4 – Test Location**

Office Address:

Octagon House  
Concorde Way  
Segensworth North  
Fareham  
Hampshire  
PO15 5RL  
United Kingdom



## 2 Test Details

### 2.1 Measurement of Electric and Magnetic Fields

#### 2.1.1 Specification Reference

FCC CFR 47 Part 1, Clause 1.1310, Table 1 Limits for maximum Permissible Exposure (MPE).  
IEEE C95.1, Table 9 MPE  
OET Bulletin 65, Section 3 Measuring RF Fields  
IEEE C95.3, Section 6.3 Measurement procedures for external fields

#### 2.1.2 Equipment Under Test and Modification State

SCG2221 TETRA mobile radio S/N:1PR002230GP58OM- Modification State 0

#### 2.1.3 Date of Test

06-February-2023

#### 2.1.4 Test Method

##### **Instrumentation:**

The specifications allow the use of either a narrowband or broadband instrument therefore a Broadband meter and probe was used with isotropic response (3-axis probe). The measurement values were recorded as average (rms).

##### **Measurement:**

Measurements of field strength to determine compliance were made, "at distances 20 cm or greater from any object." (OET Bulletin 65 Section 1).

For the assessment of thermal exposure, the electromagnetic fields are time-averaged over a period of 6 minutes.

##### **Test setup requirements:**

The test separation distance was measured from each face of the EUT to the centre of the probe (as this is the calibration point). The EUT was mounted on an 80 cm non-metallic table or floor standing for large equipment.



## 2.1.5 Limits

FCC CFR 47 Part 1, Clause 1.1310, Table 1 provides electric and magnetic field MPE limits 300 kHz – 300 MHz with averaging time of 6 minutes for the assessment of thermal effects as shown in Table 6.

The applicable MPE limits for electric and magnetic field are shown in Table 5.

The applicable most stringent reference levels for electric and magnetic field for broadband measurement of multiple frequencies at the EUT frequencies are shown in Table 6.

| Reference/Action<br>Level Limits                                                                                                                                                                                                                                                                                                                                                                                | Frequency (MHz)                          |                                          |                                         |                                          |                                          |                                         |                                          |                                          |                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------|-----------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                 | 136 – 174                                |                                          |                                         | 2412 – 2472 <sup>NOTE 1</sup>            |                                          |                                         | 2402 - 2480 <sup>NOTE 1</sup>            |                                          |                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                 | Electric<br>Field<br>MPE<br>Level<br>V/m | Magnetic<br>Field<br>MPE<br>Level<br>A/m | Magnetic<br>Field<br>MPE<br>Level<br>μT | Electric<br>Field<br>MPE<br>Level<br>V/m | Magnetic<br>Field<br>MPE<br>Level<br>A/m | Magnetic<br>Field<br>MPE<br>Level<br>μT | Electric<br>Field<br>MPE<br>Level<br>V/m | Magnetic<br>Field<br>MPE<br>Level<br>A/m | Magnetic<br>Field<br>MPE<br>Level<br>μT |
| General public<br>limits                                                                                                                                                                                                                                                                                                                                                                                        | 27.5                                     | 0.073                                    | n/a                                     | 19.42                                    | 0.052                                    | n/a                                     | 19.42                                    | 0.052                                    | n/a                                     |
| <p>NOTE 1: The MPE limits above 300 MHz in Table 6 do not provide separate electric (E) and magnetic (H) limits, only power density in mW/cm<sup>2</sup>. Therefore the equivalent limits have been calculated from:<br/> Power density <math>S \text{ W/m}^2 = 10</math> . Power density <math>\text{mW/cm}^2 = 1</math><br/> <math>E = \sqrt{(S \cdot 377)}</math><br/> <math>H = \sqrt{(S / 377)}</math></p> |                                          |                                          |                                         |                                          |                                          |                                         |                                          |                                          |                                         |

**Table 5 – Limits at EUT Frequencies**



| Frequency range (MHz)                                           | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|-----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(i) Limits for Occupational/Controlled Exposure</b>          |                               |                               |                                     |                          |
| 0.3–3.0 .....                                                   | 614 .....                     | 1.63 .....                    | *(100) .....                        | ≤6                       |
| 3.0–30 .....                                                    | 1842/f .....                  | 4.89/f .....                  | *(900/f <sup>2</sup> ) .....        | <6                       |
| 30–300 .....                                                    | 61.4 .....                    | 0.163 .....                   | 1.0 .....                           | <6                       |
| 300–1,500 .....                                                 | .....                         | .....                         | f/300 .....                         | <6                       |
| 1,500–100,000 .....                                             | .....                         | .....                         | 5 .....                             | <6                       |
| <b>(ii) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3–1.34 .....                                                  | 614 .....                     | 1.63 .....                    | *(100) .....                        | <30                      |
| 1.34–30 .....                                                   | 824/f .....                   | 2.19/f .....                  | *(180/f <sup>2</sup> ) .....        | <30                      |
| 30–300 .....                                                    | 27.5 .....                    | 0.073 .....                   | 0.2 .....                           | <30                      |
| 300–1,500 .....                                                 | .....                         | .....                         | f/1500 .....                        | <30                      |
| 1,500–100,000 .....                                             | .....                         | .....                         | 1.0 .....                           | <30                      |

**Table 6 – Limits for Maximum Permissible Exposure (MPE) (FCC CFR 47 Part 1, Clause 1.1310, Table 1)**

#### 2.1.6 Environmental Conditions

|                        |          |
|------------------------|----------|
| Ambient Temperature    | 23.9 °C  |
| Relative Humidity      | 31.8 %   |
| Ambient Electric Field | 0.22 V/m |
| Ambient Magnetic Field | 0.01 A/m |

**Table 7 – Environmental Conditions**

#### 2.1.7 Validation Check Result

| Validation Source | 50 MHz Baby monitor at 50 mm |                         |
|-------------------|------------------------------|-------------------------|
|                   | Electric Field V/m           | Magnetic Field A/m      |
| Source level      | WPF8 Probe: 24 V/m           | WPH1000 Probe: 0.03 A/m |
| Measured level    | WPF8 Probe: 25.2 V/m         | WPH1000 Probe: 0.03 A/m |

**Table 8 – Validation Check**



## 2.1.8 Test Results

### Measurement Result (Electric Field Time Averaged)

| Field Type        | RAT/<br>Antenna    | Frequency<br>(MHz) | Field<br>Strength<br>Result (time<br>averaged<br>rms) | General<br>Public<br>MPE Limit | Units | Test<br>Separation<br>Distance <sup>1</sup><br>(mm) | Compliance<br>(Yes/No) |
|-------------------|--------------------|--------------------|-------------------------------------------------------|--------------------------------|-------|-----------------------------------------------------|------------------------|
| Electric<br>field | Tetra<br>AFQNT-H4A | 136 - 155          | 2.66                                                  | 27.5                           | V/m   | > 400                                               | Yes                    |
| Electric<br>field | Tetra<br>AFQNT-H5  | 149 - 159          | 2.52                                                  | 27.5                           | V/m   | > 400                                               | Yes                    |
| Electric<br>field | Tetra<br>AFQNT-H6A | 155 - 174          | 2.01                                                  | 27.5                           | V/m   | > 400                                               | Yes                    |
| Electric<br>field | WLAN 11b           | 2412 - 2472        | 4.01                                                  | 19.42                          | V/m   | > 400                                               | Yes                    |
| Electric<br>field | WLAN 11g           | 2412 - 2472        | 3.60                                                  | 19.42                          | V/m   | > 400                                               | Yes                    |
| Electric<br>field | WLAN 11n           | 2412 - 2472        | 3.68                                                  | 19.42                          | V/m   | > 400                                               | Yes                    |
| Electric<br>field | Bluetooth          | 2402 - 2480        | 1.08                                                  | 19.42                          | V/m   | > 400                                               | Yes                    |

**Table 9 – Electric Field (Time Averaged)**



**Measurement Result (Magnetic Field Time Averaged)**

| Field Type                                                                                                                                                                                                                                               | RAT/<br>Antenna    | Frequency<br>(MHz) | Field<br>Strength<br>Result (time<br>averaged<br>rms) | General<br>Public<br>MPE Limit | Units | Test<br>Separation<br>Distance <sup>1</sup><br>(mm) | Compliance<br>(Yes/No) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|-------------------------------------------------------|--------------------------------|-------|-----------------------------------------------------|------------------------|
| Magnetic<br>field                                                                                                                                                                                                                                        | Tetra<br>AFQNT-H4A | 136 - 155          | 0.03                                                  | 0.073                          | A/m   | > 400                                               | Yes                    |
| Magnetic<br>field                                                                                                                                                                                                                                        | Tetra<br>AFQNT-H5  | 149 - 159          | 0.02                                                  | 0.073                          | A/m   | > 400                                               | Yes                    |
| Magnetic<br>field                                                                                                                                                                                                                                        | Tetra<br>AFQNT-H6A | 155 -174           | 0.02                                                  | 0.073                          | A/m   | > 400                                               | Yes                    |
| Magnetic<br>field                                                                                                                                                                                                                                        | WLAN 11b           | 2412 - 2472        | 0.01*                                                 | 0.052                          | A/m   | > 400                                               | Yes                    |
| Magnetic<br>field                                                                                                                                                                                                                                        | WLAN 11g           | 2412 - 2472        | 0.01*                                                 | 0.052                          | A/m   | > 400                                               | Yes                    |
| Magnetic<br>field                                                                                                                                                                                                                                        | WLAN 11n           | 2412 - 2472        | 0.01*                                                 | 0.052                          | A/m   | > 400                                               | Yes                    |
| Magnetic<br>field                                                                                                                                                                                                                                        | Bluetooth          | 2402 - 2480        | 0.003*                                                | 0.052                          | A/m   | > 400                                               | Yes                    |
| <p>*Magnetic field calculated from<br/> <math>S = E^2 / 377</math><br/> <math>H = S / E</math><br/> Where<br/> S = Power Density<br/> E = Electric Field<br/> Power density <math>S \text{ W/m}^2 = 10 \cdot \text{Power density mW/cm}^2 = 1</math></p> |                    |                    |                                                       |                                |       |                                                     |                        |

**Table 10 – Magnetic Field (Time Averaged)**

Note 1: The test separation distance is that declared by the manufacturer or the minimum distance for compliance that is  $\geq 40$  cm.



### 2.1.9 Multiple Frequency Summation

The results are combined in accordance with FCC CFR 47 Part 1.1307(b)(3)(ii)(B) equation for power shown below to determine compliance as reported in Table 11 and Table 12. Each broadband probe integrates the entire frequency range covered by the probe.

$$\sum (\text{Evaluated}_k / \text{Exposure Limit}_k) \leq 1$$

Where  $\text{Evaluated}_k$  is the power density level  $S$  and  $\text{Exposure Limit}_k$  is the power density limit. Since power density is related to field strength by;

$$S = E^2 / Z = H^2 Z \text{ where } Z \text{ is the wave impedance}$$

The summation ratio for power density can be replaced by field strength by squaring the ratio ( $Z$  cancels out in the ratio);

$$\sum (E_m^2 / E_{\text{MPE LIMIT}}^2) \leq 1$$

where:

$E_m$  = Measured electric field at a specific frequency (i.e. maximum RMS result for each probe frequency band used)

$E_{\text{MPE LIMIT}}$  = MPE limit for the electric field at the measurement frequency (minimum limit in the frequency range covered by the probe)

$$\sum (H_m^2 / H_{\text{MPE LIMIT}}^2) \leq 1$$

where:

$H_m$  = Measured magnetic field at a specific frequency (i.e. maximum RMS result for each probe frequency band used)

$H_{\text{MPE LIMIT}}$  = MPE limit for the magnetic field at the measurement frequency (minimum limit in the frequency range covered by the probe)



Multiple Frequency Summation Measurement Result (Time Averaged Electric Field)

Electric Field - Summation of TETRA + WLAN

| Field Type        | RAT/<br>Antenna        | E <sub>1</sub> Field<br>Strength<br>Result<br>(time<br>average<br>rms)<br><br>TETRA<br>136 MHz | E <sub>2</sub> Field<br>Strength<br>Result<br>(time<br>average<br>rms)<br><br>WLAN<br>2412 MHz | Units | Summation<br>:<br>$(E_1^2/E_{MPEL}^2)$<br>+<br>$(E_2^2/E_{MPEL}^2)$ | Test<br>Separation<br>Distance <sup>2</sup><br>(mm) | Summation<br>Result ≤1<br>and<br>compliant? |
|-------------------|------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------|
| Electric<br>field | Tetra<br>AFQNT-<br>H4A | 2.66                                                                                           | 4.01                                                                                           | V/m   | 0.052                                                               | > 400                                               | Pass                                        |

Electric Field - Summation of TETRA + Bluetooth

| Field Type        | RAT/<br>Antenna        | E <sub>1</sub> Field<br>Strength<br>Result<br>(time<br>average<br>rms)<br><br>TETRA<br>136 MHz | E <sub>2</sub> Field<br>Strength<br>Result<br>(time<br>average<br>rms)<br><br>WLAN<br>2402 MHz | Units | Summation<br>:<br>$(E_1^2/E_{MPEL}^2)$<br>+<br>$(E_2^2/E_{MPEL}^2)$ | Test<br>Separation<br>Distance <sup>2</sup><br>(mm) | Summation<br>Result ≤1<br>and<br>compliant? |
|-------------------|------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------|
| Electric<br>field | Tetra<br>AFQNT-<br>H4A | 2.66                                                                                           | 1.08                                                                                           | V/m   | 0.013                                                               | > 400                                               | Pass                                        |

**Table 11 – Summation of Electric Field (Time Average)**



### Multiple Frequency Summation Measurement Result (Time Averaged Magnetic Field)

#### Magnetic Field - Summation of TETRA + WLAN

| Field Type        | RAT/<br>Antenna        | H <sub>1</sub> Field<br>Strength<br>Result<br>(time<br>average<br>rms<br>TETRA<br>136 MHz | H <sub>2</sub> Field<br>Strength<br>Result<br>(time<br>average<br>rms<br>WLAN<br>2412 MHz | Units | Summation<br>:<br>$(H_1^2/H_{MPEL}^2)$<br>+<br>$(H_2^2/H_{MPEL}^2)$ | Test<br>Separation<br>Distance <sup>2</sup><br>(mm) | Summation<br>Result ≤1<br>and<br>compliant? |
|-------------------|------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------|
| Magnetic<br>field | Tetra<br>AFQNT-<br>H4A | 0.03                                                                                      | 0.01                                                                                      | A/m   | 0.206                                                               | > 400                                               | Pass                                        |

#### Magnetic Field - Summation of TETRA + Bluetooth

| Field Type        | RAT/<br>Antenna        | H <sub>1</sub> Field<br>Strength<br>Result<br>(time<br>average<br>rms<br>TETRA<br>136 MHz | H <sub>2</sub> Field<br>Strength<br>Result<br>(time<br>average<br>rms<br>Bluetooth<br>2402 MHz | Units | Summation<br>:<br>$(H_1^2/H_{MPEL}^2)$<br>+<br>$(H_2^2/H_{MPEL}^2)$ | Test<br>Separation<br>Distance <sup>2</sup><br>(mm) | Summation<br>Result ≤1<br>and<br>compliant? |
|-------------------|------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------|
| Magnetic<br>field | Tetra<br>AFQNT-<br>H4A | 0.03                                                                                      | 0.003                                                                                          | A/m   | 0.172                                                               | > 400                                               | Pass                                        |

**Table 12 – Summation of Magnetic Field (Time Average)**

#### 2.1.10 Spatial Averaging

Spatial averaging is not mandated in FCC CFR 47 Part 1.1310 or the associated documents therefore spatial averaging was not applied and maximum field strength levels were reported.



2.1.11 Test Location and Test Equipment Used

This test was carried out in Screened Room at our Fareham Test Laboratory.

| Instrument                 | Manufacturer          | Type No | TE No | Calibration Period (months) | Calibration Due |
|----------------------------|-----------------------|---------|-------|-----------------------------|-----------------|
| Signal Analyser            | Keysight Technologies | EXA     | 4969  | 12                          | 07-Feb-2024     |
| EM Field Meter             | Wavecontrol           | SMP2    | 5769  | 24                          | 01-Jun-2023     |
| Field Meter Probe Electric | Wavecontrol           | WPF8    | 5771  | 24                          | 01-Jun-2023     |
| Field Meter Probe Magnetic | Wavecontrol           | WPH60   | 5772  | 24                          | 01-Jun-2023     |
| Field Meter Probe Magnetic | Wavecontrol           | WPH1000 | 5871  | 24                          | 14-Oct-2023     |
| Hygrometer                 | Rotronic              | HP21    | 5264  | 12                          | 26-Jul-2023     |

Table 13 – Test Equipment

2.1.12 Test Setup Photographs



Figure 3 – Photographs



**2.2 Measurement Uncertainty**

For a 95% confidence level, the measurement uncertainties for defined systems are:

| Test Name                   | Measurement Uncertainty |
|-----------------------------|-------------------------|
| Electric field strength V/m | ±3.21 dB                |
| Magnetic field strength A/m | ± 2.28 dB               |

**Table 14 – Measurement Uncertainty**

IEEE C95.3 clause 5.2.13 requires that measurement uncertainty should be known and included in the measurement report. It does not specify a maximum measurement uncertainty but suggests that uncertainties of ±2 dB or even greater may be acceptable if the levels are well below the limits of the MPE.

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2007, Clause 4.4.3 and 4.5.1. (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.