



# REALWEAR NAVIGATOR<sup>®</sup> Z1

## User Guide



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# REALWEAR NAVIGATOR® Z1



The RealWear NAVIGATOR Z1 is hands-free Android™ tablet class wearable computer for industrial workers and is an intrinsically safe ATEX Zone 1 and NORTH AMERICA C1/D1 certified fully rugged head-mounted device.

The RealWear NAVIGATOR Z1 provides the foundation for Connected Worker programs.

Use it in wet, dusty, hot, dangerous, and loud industrial environments.

It optionally snaps into safety helmets or attaches to bump caps and can be used with safety glasses or corrective eyewear.

The high-resolution micro display fits just below your line of sight. It's an industrial dashboard: there when you need it and out of your way when you don't.

The NAVIGATOR Z1 works with powerful software applications from our solution partners in four core categories, each optimized for completely hands-free voice control. That means no scrolling, swiping, or tapping - just simple voice commands.

Use it for remote mentor video calling, document navigation, guided workflow, mobile forms and industrial IoT data visualization.

## NAVIGATOR Z1 Features



**Intrinsically Safe**  
IECEX ZONE1, ATEX ZONE 1 AND NORTH AMERICA  
C1/D1



**100% Hands free**  
Voice based operating system with local speech  
recognition in loud areas.



**Powerful Audio**  
Integrated speaker and 3.5mm audio jack shall be  
used with the Ear bud hearing protection headphones  
model H1100G, and H1101G and other accessories,  
which comply with the intrinsic safety entity  
parameters in the certificate.



**Unmatched Noise Cancellation**  
The NAVIGATOR Z1 uses four microphones and  
advanced algorithms to perform noise cancellation  
prior to voice recognition.



**PPE Compatible**  
Designed to work with standard hard helmets, bump  
caps and safety glasses.



**Full-Shift Battery**  
8–10 hours with typical use.



**Outdoor Display**  
Viewable in bright sunlight.



**Waterproof**  
IP66 – Protected against heavy seas or powerful jets  
of water.



**Dust Tight**  
IP66 – Complete protection against the ingress of  
micro particles.



**Drop Proof**  
Resistant to 2-meter drops onto concrete from any  
angle.



**Built Rugged**  
Fully operational from -20° C to +55° C.

# NAVIGATOR Z1 Product Specifications

## Core Platform & Functions

Qualcomm® QCS6490 - Kryo 670 CPU built on Arm v8 Cortex technology; 6th gen Qualcomm AI Engine; Adreno 643 GPU at 812 MHz

## Included Applications

Document Navigator, Camera with Barcode Reader, Audio Recorder, Video Recorder, Webpage Viewer, Cloud Sync, Media Player, Calculator, Pedometer, Timer

## Languages Supported

Chinese (Cantonese, Mandarin-Simplified and Traditional), Czech, Danish, Dutch, English (American, Australian, British, Indian), French, German, Indonesian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Thai, Turkish

## Memory

128 GB Internal Storage / 8 GB RAM

## Operating System

Android 12 (AOSP) + WearHF™ hands-free interface

## Connectivity & Sensors

### *Bluetooth*

Bluetooth Low Energy 5.2

### *Wi-Fi*

Wi-Fi 6E - IEEE 802.11a/b/g/n/ac/ax – 2.4GHz and 5GHz, 6GHz

### *GPS and Location*

GPS, GLONASS, NavIC, BeiDou, Galileo, QZSS, SBAS

### *IMU*

9-DOF (3-axis accelerometer, magnetometer, and gyroscope), software enhanced stabilization

## Battery

### *Capacity*

2550 mAh Li-Ion; removable and rechargeable  
Battery shall be replaced outside the HAZARDOUS LOCATION.  
Battery shall be charged outside the HAZARDOUS LOCATION.  
Battery package shall not be opened.  
Battery package only be replaced with the same model "B21S".

### *Battery Life*

Full shift (8-10 hours) with typical use

## Physical Characteristics

### *Weight*

383 g

### *Ruggedization*

Intrinsically Safe, 2-meter drop, IP66, MIL-STD-810H

### *Dedicated Keys*

Power, Action, Volume + / -

*Ports*

3.5mm audio, 1 USB-C for data and charging

*Boom Arm*

Adjust six ways for all head sizes, left or right eye compatible, display flips out of the way when not in use

*Display*

*Type*

24° field-of-view, 24-bit color LCoS, 0.35 inch diagonal, outdoor visible

*Resolution*

HD (1280x720)

*Audio*

*Microphone*

4 digital microphones with active noise cancellation  
Accurate voice recognition even in 100 dBA of typical industrial noise

*Speaker*

Internal 94 dB open-air loudspeaker with a visual warning that must be acknowledged above 80 dB. Standard acoustic output level is below 76 dB.

*Multimedia*

*Camera*

48 MP Sensor, PDAF with LED flashlight, modular  
Camera shall be removed only outside the HAZARDOUS LOCATION.

*Video*

Up to 1080p @ 60fps, >6X zoom in HD, video stabilization. codecs: VP8, VP9, H.264, H.265 HEVC

*Accessories*

*Includes Intrinsically Safe inline safety box charging cable, Works with most Navigator accessories including mounting solutions, Intrinsically Safe hearing protection, replacement clips, and more. Not all accessories are rated for IS zones.*

# Introduction: Understanding Intrinsically Safe Devices and Their Use in Hazardous Locations

## Background

RealWear launched a model of its award-winning ruggedized head-mounted wearable computer for industry called the RealWear Navigator Z1 (hereafter referred as the "NAVIGATOR Z1"). The NAVIGATOR Z1 is deemed "Intrinsically Safe."

## Introduction

While much has been written about operating equipment safely, there has been far less literature written on the equipment itself that must be used. This white paper attempts to explain simply what it means for a product to be deemed intrinsically safe, and what type of certification is necessary to effectively reduce the risk of an explosion. Choosing the right certified equipment for the right job is an important task of every buyer.

## Company disclaimer

This paper should serve only as a primer and other documents and expertise is required for final purchasing decisions.

## What does Intrinsically Safe mean?

Intrinsic safety is a design approach to make an equipment safe to be used in a hazardous location. Hazardous locations are the areas where flammable liquids, gases or vapors or combustible dust exist in sufficient quantities to produce an explosion or fire. In hazardous locations, specially designed equipment must be used to protect against the potentially explosive environments. These devices which can be used in the potentially explosive environments without causing an explosion are called Intrinsically Safe devices. The intrinsically safe design technique is based on limiting energy, electrical and thermal to a level below that required to ignite a specific hazardous atmospheric mixture.

## What is an Explosion?

An explosion is a rapid increase in volume and release of energy in an extreme manner, usually with the generation of high temperatures and the release of gases. There are three elements which must be present to cause an explosion:



Figure 0: Three Required Elements for Occurrence of an Explosion

### 1. Ignition Source

An ignition source is an element which can cause a fire or explosion. Open flames, sparks, static electricity and hot surfaces are all possible ignition sources.

### 2. Flammable substance

Flammable substances are those gases, liquids and solids that will ignite and continue to burn in air if exposed to a source of ignition.

### 3. Oxidizer

An oxidizer is a kind of chemical whereby fuel is required to burn. An oxidizer must be present in sufficient quantity in combination with the flammable substance to produce an explosive mixture. The most common oxidizer is air (O<sub>2</sub>). Industries like refineries, chemical plants, paint shops, mills, flour silos, tanks, cleaning facilities, and loading facilities for flammable gases, liquids, and solids are the places where explosions occur frequently.

How to eliminate/minimize the possibility of an explosion?

As mentioned above, there are three elements which must be present to cause an explosion. If one of these elements is eliminated, ignition will not occur. In hazardous locations, flammable substances and oxidizers cannot be eliminated with certainty. Therefore, inhibiting ignition of a potentially explosive atmosphere can eliminate danger at the source. The intrinsically safe device limits the electrical energy at potential sources of ignition in electrical circuits (hot components and spark sources) to such low levels that – even under abnormal (fault) conditions – there is no possibility of the electrical energy igniting an explosive atmosphere.

How to tell if equipment is legitimately safe to be used in hazardous locations?

An intrinsically safe product must go through a rigorous set of tests put forth by experts in the field of safety. Products that stand up to these standards and pass these tests are considered "Intrinsically Safe Certified." There are many different authorized agencies that certify intrinsically safe equipment. The European certification is called ATEX; the North American standard is the NEC500, which can be applied through UL, FM, CSA or QPS, for example. Also, North American requirements for installation are outlined in NFPA70 (National Electrical Code) and CSA C22.1 (Canadian Electrical Code) and equipment can be evaluated in accordance with the Zone or Division System. An international procedure for the certification of electrical equipment across the globe is called IECEx. Any equipment that is used in hazardous locations should be certified by one of these well-known systems and agencies.

What is ATEX?

ATEX is an abbreviation for "ATmosphere EXplosible". At the same time, ATEX is the abbreviated name of the European Directive 2014/34/EU concerning the placing on the market of explosion-proof electrical and mechanical equipment, components and protective systems.

It also covers safety devices, controlling devices and regulating devices intended for use outside potentially explosive atmospheres but required for, or contributing to, the safe functioning of equipment and protective systems with respect to the risks of explosion.

Equipment and protective systems which fall under Directive 2014/34/EU shall be placed on the market only if they bear a CE mark and are accompanied by an EC attestation of conformity certifying that the basic health and safety requirements have been met and that the applicable conformity assessment procedures have been observed.

#### Classification of Zones

According to Directive 2014/34/EU, a potentially explosive area is a space in which the atmosphere could become explosive on account of the local and/or operational conditions. An explosive atmosphere is defined as a mixture with air, under atmospheric conditions, of flammable substances in the form of gases, vapors, mists or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture. In North America, hazardous locations have traditionally been defined by a combination of classes and divisions as follows:

| Hazard - Gas / vapor / mist |   |
|-----------------------------|---|
| Zone 0                      | A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapor or mist <i>is present</i> continuously or for long periods or frequently  |
| Zone 1                      | A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapor or mist <i>is likely</i> to occur in normal operation occasionally  |
| Zone 2                      | A place in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapor or mist <i>is not likely</i> to occur in normal operation but, if it does occur, will persist for a short period only |



Figure 1: Zone Classification for Gas/Vapor/Mist

Dust clouds in the explosive region (above the minimum explosible concentration) are categorized into 3 zones, based upon the grade of release.



| Hazard - Powder / dust |  |
|------------------------|--|
| Zone 20                | A place in which an explosive atmosphere in the form of a cloud of combustible dust in air <u>is present continuously, or for long periods or frequently.</u>                                      |
| Zone 21                | A place in which an explosive atmosphere in the form of a cloud of combustible dust in air <u>is likely to occur in normal operation occasionally.</u>   |
| Zone 22                | A place in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only. |

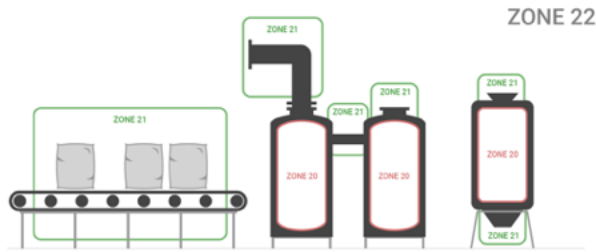


Figure 2: Zone Classification for Combustible Dust/Powder

**What is IECEx?**

International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres (IECEx System)  
 IECEx is a voluntary system which provides an internationally accepted means of proving compliance with IEC standards. IEC standards are used in many national approval schemes and, as such, IECEx certification can be used to support national compliance, negating the need in most cases for additional testing.

**Benefits of IECEx**

Because countries operate under different standards, “Ex” equipment often needs to be re-tested and re-certified to the appropriate standards of that country, adding to the cost of the equipment. The IECEx scheme significantly reduces the need for re-testing and certification by conforming to international IEC standards and therefore makes international trade easier, quicker and more cost-effective.

**IECEx Process**

CSA Group and Sira Certification Service are both Accepted Certification Bodies (ExCB) and Test Laboratories (ExTL) and, as such, can assess a product to the relevant standards, resulting in the compilation of an IECEx Test Report (ExTR) and IECEx Certificate of Conformity (CofC).

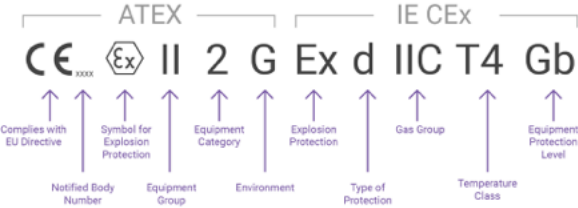


Figure 3: Typical ATEX and IECEx Markings

### What is CSA?

CSA stands for the custodian of Canadian Standards and is responsible for issuing and updating relevant standards and they are also a certification body which is a separate entity. The organization, CSA International, is recognized throughout North America and Europe. Like QPS and other certification companies, it tests consumer and business products to see how it responds to certain situations and types of wear.

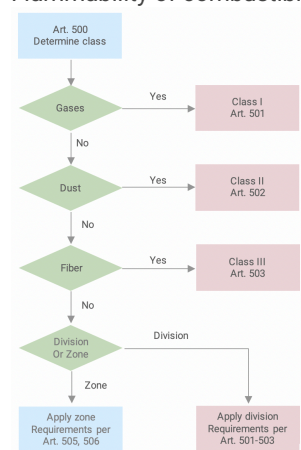
The CEC uses the same classification of hazardous locations set for by the NEC which breaks hazardous locations into classes and divisions. CEC also accounts for the European zones, which are equivalent to divisions. For example, in CEC, you shall see it stated as, "Class 1, Division 1", while in Europe, you will see it stated as, "Class 1, Zone 1". It is also seen abbreviated as, "C1/D1", "C1D1," or "C1-D1."

### What is NEC500?

The National Electrical Code (NEC), is a regionally adoptable standard for the safe installation of electrical equipment in the United States. NEC500 refers to Article 500 in NEC. A hazardous (classified) location is defined an area where the possibility of fire or explosion can be created by the presence of flammable or combustible gases or vapors, combustible dust, or easily ignitable fibers/filings. Electric arcs, sparks, and/or heated surfaces can serve as a source of ignition in such environments. Article 500 provides a foundation for applying Article 501 (Class I Locations), Article 502 (Class II Locations), Article 503 (Class III Locations), and Article 504 (Intrinsically Safe Systems)—all of which immediately follow Article 500.

The NEC organizes flammability properties into Class I, II, and III, in Article 501, 502, and 503, respectively. It defines and describes these in Article 500 (OSHA also defines and describes these). Article 500 is the basis for all hazardous location work and the related Articles that follow it (see Figure). It is also worth mentioning that NEC505 organize about Zone systems, which is comparably with NEC500.

Flammability of combustible liquids are defined by their flash-point. The flash-point is the temperature at which the



material will generate sufficient quantity of vapor to form an ignitable mixture. The flash point determines if an area needs to be classified. A material shall have a relatively low auto-ignition temperature yet if its flash-point is above the ambient temperature, then the area shall not need to be classified. Conversely, if the same material is heated and handled above its flash-point, the area must be classified for proper electrical system design, as it will then form an ignitable mixture.

Divisions, zones, and groups  
NEC article 500, 501, 502, and 503, Class I, II, and III locations are further broken down into Divisions. Divisions and zones simply refer to the constancy and/or level of the hazard.

There are two divisions and three zones:

|                      |  |
|----------------------|--|
| Division 1 or Zone 0 | the hazard is continuous                             |
| Division 1 or Zone 1 | the hazard is intermittent                           |
| Division 2 or Zone 2 | the hazard is present only under abnormal conditions |

There are three hazardous location classes – respectively Class 1, Class 2, and Class 3. They simply refer to the type of hazard in general terms:

|         |                                 |
|---------|---------------------------------|
| Class 1 | the hazard is a flammable vapor |
| Class 2 | the hazard is a flammable dust  |
| Class 3 | the hazard is a flammable fiber |

Each chemical gas or vapor used in industry is classified into a gas group.

| NEC Division System Gas & Dust Groups |                     |   |
|---------------------------------------|---------------------|---|
| Area                                  | Group               | Representative Materials  |
| Class I, Division 1 & 2               | A                   | Acetylene   |
|                                       | B                   | Hydrogen  |
|                                       | C                   | Ethylene  |
|                                       | D                   | Propane   |
| Class II, Division 1 & 2              | E (Division 1 only) | Metal dusts, such as magnesium (Division 1 only)  |
|                                       | F                   | Carbonaceous dusts, such as carbon & charcoal   |
|                                       | G                   | Non-conductive dusts, such as flour, grain, wood & plastic  |
| Class III, Division 1 & 2             | None                | Ignitable fibers/flyings, such as cotton lint, flax & rayon   |
| Zone 0, 1 & 2                         | IIC                 | Acetylene & Hydrogen (equivalent to NEC Class I, Groups A and B)  |
|                                       | IIB+H2              | Hydrogen (equivalent to NEC Class I, Group B)   |
|                                       | IIB                 | Ethylene (equivalent to NEC Class I, Group C)   |
| Zone 20, 21 & 22                      | IIIC                | Conductive dusts, such as magnesium (equivalent to NEC Class II, Group E)                               |
|                                       | IIIB                | Non-conductive dusts, such as flour, grain, wood & plastic (equivalent to NEC Class II, Groups F and G) |
|                                       | IIA                 | ignitable fibers/flyings, such as cotton lint, flax & rayon (equivalent to NEC Class III)               |
| Mines susceptible to firedamp         | I (IEC only)        | Methane   |

Table 0: NEC Division System Gas & Dust Groups

Group IIC is the most severe Zone system gas group. Hazards in this group gas can be ignited very easily indeed. Equipment marked as suitable for Group IIC is also suitable for IIB and IIA. Equipment marked as suitable for IIB is also suitable for IIA but NOT for IIC. If equipment is marked, for example, Ex e II T4 then it is suitable for all subgroups IIA, IIB and IIC

A list must be drawn up of every explosive material that is on the refinery/chemical complex and included in the site plan of the classified areas. The above groups are formed in order of how explosive the material would be if it was ignited, with IIC being the most explosive Zone system gas group and IIA being the least. The groups also indicate how much energy is required to ignite the material by energy or thermal effects, with IIA requiring the most energy and IIC the least for Zone system gas groups.

Temperature classification

Another important consideration is the temperature classification of the electrical equipment. The surface temperature or any parts of the electrical equipment that shall be exposed to the hazardous atmosphere should be tested that it does not exceed 80% of the auto-ignition temperature of the specific gas or vapor in the area where the equipment is intended to be used.

The temperature classification on the electrical equipment label will be one of the followings (in degree Celsius):

| USA °C    |           | International (IEC) °C | Germany °C<br>Continuous - Short Time |
|-----------|-----------|------------------------|---------------------------------------|
| T1 - 450  | T3A - 180 | T1 - 450               | G1: 360 - 400                         |
| T2 - 300  | T3B - 165 | T2 - 300               | G2: 240 - 270                         |
| T2A - 280 | T3C - 160 | T3 - 200               | G3: 160 - 180                         |
| T2B - 260 | T4 - 135  | T4 - 135               | G4: 110 - 125                         |
| T2C - 230 | T4A - 120 | T5 - 100               | G5: 80 - 90                           |
| T2D - 215 | T5 - 100  | T6 - 85                |                                       |
| T3 - 200  | T6 - 85   |                        |                                       |

Table 1: Temperature Classification

What does it mean to have Class 1, Div 1, Zone 1 Certification?

Those certified devices can be used in environments in which an explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapor or mist is likely to occur in normal operation occasionally. It shall be obvious, by now, that the correct designation is extremely important for worker safety reasons. Failing to correctly designate a product can result in an injury or fatal disaster, severe damage to both facilities and resources, and bring about legal ramifications or other risks. Of course, this certification comes only after thorough and rigorous testing by experienced, independent third parties.

RealWear NAVIGATOR Z1 is a Class 1, Div 1, Zone 1 Certified Wearable Computing device which can be safely used in such hazardous locations. Here are the current certifications for the RealWear NAVIGATOR Z1:

|               |   |
|---------------|---|
| ATEX          | II 2G Ex ib IIC T4 Gb<br>II 2D Ex ib IIIC T200°C Db   |
| IECEX         | Ex ib IIC T4 Gb<br>Ex ib IIIC T200°C Db   |
| IA            | Ex ib IIC T4 Gb<br>Ex ib IIIC T200°C Db   |
| North America | Intrinsically Safe<br>Class I, Division 1, Groups A,B,C,D T4<br>Class II Division 1, Groups E,F,G T200°C<br>Class III |
| INMETRO       | Ex ib IIC T4 Gb<br>Ex ib IIIC T200°C Db   |
| PCEC          | Ex ib IIC T4 Gb<br>Ex ib IIIC T200°C Db   |

Table 2: RealWear Certifications (as of 03.21.2024)

#### Intrinsically Safe Certification Process for RealWear

Manufacturing an Intrinsically Safe product and certifying it to be used in hazardous locations across the world is a skilled and challenging task. RealWear partnered with industry experts at i.safe MOBILE for the development and certification of the RealWear NAVIGATOR Z1 product. i.safe MOBILE incorporates all international standards into the product development and is also a member of relevant standards committees. To fulfill all requirements for explosion protection, i.safe MOBILE develops its products from the ground up, so users all over the world can be sure to use high-quality communication technology compliant with current standards. i.safe MOBILE developed and tested the RealWear NAVIGATOR Z1 which was certified by renowned notified bodies ATEX, IECEx and NEC500 to ensure that the products satisfied all country-specific requirements. To achieve the highest level of certification that RealWear achieved is no small feat and took more than two years to complete.

#### References

- <https://www.mikeholt.com//instructor2/img/product/pdf/14HAZDVD-1417-sample.pdf>
- <http://www.ecmweb.com/nec/hazardous-locations-and-nec>
- <https://www.apgsensors.com/about-us/blog/csa-class-1-what-it-means-and-why-you-should-care>
- [http://literature.rockwellautomation.com/idc/groups/literature/documents/wp/800-wp003\\_en-p.pdf](http://literature.rockwellautomation.com/idc/groups/literature/documents/wp/800-wp003_en-p.pdf)
- [https://en.wikipedia.org/wiki/Electrical\\_equipment\\_in\\_hazardous\\_areas#Gas\\_and\\_dust\\_groups](https://en.wikipedia.org/wiki/Electrical_equipment_in_hazardous_areas#Gas_and_dust_groups)

## NAVIGATOR Z1 Software Brief

NAVIGATOR Z1 powered by Android 12 - is the only software purpose-built for harsh or dangerous environments where workers use their hands for more connected and secure work. It is optimized for safe and secure jobs, taking hands-free to new heights of productivity and connectivity.

# NAVIGATOR Z1 Safety Guidelines

## Battery Performance

A rechargeable battery powers your device. Use only the "i.safe PROTECTOR 2.0" to charge the battery. Charge only the device outside HAZARDOUS LOCATION. Use the battery only for its intended purpose. Never use any charger or battery that is damaged. If the battery is completely discharged, it shall take a few minutes before the charging indicator appears on the display or before the device can be used. The full performance of a new battery is achieved only after 3 to 4 complete charge and discharge cycles. The battery can be charged and discharged for multiple cycles, but it will eventually wear out.

Unplug the "i.safe PROTECTOR 2.0" from the electrical plug and the device when not in use. Ensure that you do not leave the fully charged battery connected to the "i.safe PROTECTOR 2.0". If left unused, a fully charged battery will lose its charge over time.

Warning: There is a risk of explosion while charging if a battery other than the specified model is used.

## Avoid Short Circuit

Do not short-circuit the battery. An accidental short-circuit can occur when a metallic object such as a coin, clip, or pen causes direct connection of the positive (+) and negative (-) terminals of the battery. A short-circuit at the terminals shall damage the battery or the connecting object.

## Avoid High Temperatures

Leaving the battery in hot or cold places, such as in a closed car in summer or winter conditions, will reduce the capacity and lifetime of the battery. For the best results, try to keep the battery between -10°C and +50°C (+14°F and 122°F). A device with a hot or cold battery shall not work temporarily, even when the battery is fully charged. Battery performance is particularly limited in temperatures well below freezing.

## Battery Disposal

Do not dispose of the device in fire as it contains an inbuilt battery which shall explode. Dispose of the device according to local regulations and recycle when possible. Do not dispose as household waste. Do not dismantle, open or shred cells or batteries. In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. In the event of leak or a hazard seek medical help immediately.

## Child Safety

Do not allow children to play with your device or its accessories. Keep it out of their reach. They could hurt themselves or others or could accidentally damage the device or accessories. Your device and its accessories shall contain small parts, which could be detached and create a choking hazard.

## Health and Safety Warnings

Stop using RealWear NAVIGATOR Z1 or its display immediately if you experience a headache, vertigo, dizziness or nausea. Do not use the NAVIGATOR Z1 display while operating any vehicle. Move the boom arm completely out of your line of sight when not using the display. Maintain situational awareness of your surroundings while using the NAVIGATOR Z1.

## Safety and Usage Guidelines

- Do not use the display while operating any vehicle. While in a vehicle in motion or actively operating any equipment, make sure the boom arm or display pod is sufficiently out of your line of sight.
- Eye protection is recommended in hazardous work environments. Use of eye protection is up to the respective business operations and occupations of each end user.
- Always use your dominant eye for comfortable viewing.

### Disposal of Old Electrical and Electronic Equipment



The symbol of the crossed-out wheeled bin indicates that within the countries in the European Union, this product, and any enhancements marked with this symbol, cannot be disposed as unsorted waste but must be taken to separate collection at their end-of-life.

### Disposal of Battery



Please check local regulations for disposal of batteries. The battery should never be placed in municipal waste. Use a battery disposal facility if available.

### Guideline for Headphone and Earphone



To prevent possible hearing damage, do not listen at high volume levels for long periods.

A pleine puissance, l'écoute prolongée du baladeur peut endommager l'oreille de l'utilisateur.

### Charger Use Safety Instructions

Warning: To use the charger follow these instructions:

- Make sure that the cable plug is properly connected.
- Keep the charger away from liquids.
- In case of any strange smell or noise from the charger, disconnect it and contact support.
- Before cleaning the cable or charger, disconnect from power supply.
- When using an extension cable, check the integrity of the ground conductor.
- Disconnect the charger from NAVIGATOR Z1, once the battery is fully charged.
- Do not use this charger in wet areas. This charger is for indoor use only.
- Do not insert or remove the plug with wet hands.
- Do not open the charger. For any issues, contact support.
- Do not cut, break or bend the cable in a knot.
- Do not put any objects on the cable that shall let it overheat. It shall damage the cable and cause fire or electrocution.
- Do not use any cable other than the original cable as it shall cause short circuit or electrocution.



## Safety Instructions – Usage in Ex-Hazardous Areas

### 1 Note

This document contains the safety instructions necessary for the safe use of the REALWEAR NAVIGATOR® Z1 model T21S device in explosive and potentially explosive atmospheres. Such areas or zones are referred to as “ex-hazardous areas” in this document.

### 2 Introduction

This document contains information and safety regulations which are to be observed – without fail - for safe operation of the device under the described conditions. Non-observance of this information and instructions can have serious consequences and / or shall violate regulations. Please read the manual and these safety instructions before using the device. In case of any translation or printing errors, the English version shall apply.


### 3 Application

#### 3.1 ATEX, IECEX & UKEx


The REALWEAR NAVIGATOR® Z1 model T21S is approved for use in zone 1, zone 2, zone 21 and zone 22 in accordance with directives 2014/34/EU (ATEX) and the IECEX System.

#### Marking:

ATEX:  II 2G Ex ib IIC T4 Gb

 II 2D Ex ib IIIC T200°C Db

EU Type Examination Certificate: EPS 23 ATEX 1 215 X


CE-designation:  2004

IECEX: Ex ib IIC T4 Gb

Ex ib IIIC T200°C Db

IECEX Certificate: IECEX EPS 23.0053X

UKEX:  II 2G Ex ib IIC T4 Gb

 II 2D Ex ib IIIC T200°C Db

UK Type Examination Certificate: EPS 23 UKEX 1 216 X

UKCA-designation:  8507

IA: Ex ib IIC T4 Gb

Ex ib IIIC T200°C Db

IA Certificate: MTEEx-S/24.0007 X

INMETRO: Ex ib IIC T4 Gb

Ex ib IIIC T200°C Db

INMETRO Certificate: BRA 24.GE0002X

PCEC: Ex ib IIC T4 Gb

Ex ib IIIC T200°C Db

PCEC Certificate: CE24.0525X

Temperature range: -20 °C ... +55 °C

#### 3.2 NEC & CEC

The REALWEAR NAVIGATOR® Z1 model T21S is approved for use in:

Class I, Division 1, Group ABCD, T4

Class II, Division 1, Group EFG, T200°C

Class III,

I.S.

-20°C ≤ Tamb ≤ 55°C

#### 3.3 Manufacturer

i.safe MOBILE GmbH

i\_Park Tauberfranken 10

97922 Lauda-Koenigshofen Germany

#### 4 Faults and Damage

Before entering ex-hazardous areas, the safety of the device must be checked. If there is any reason to suspect that the safety of the device has been compromised, it must be withdrawn from use and removed from any ex-hazardous areas immediately.

Measures must be taken to prevent any accidental restarting of the device. The safety of the device shall be compromised, if, for example:

- Malfunctions occur.
- The housing of the device shows damage.
- The device has been exposed to excessive loads.
- The device has been stored improperly.
- Markings or labels on the device are illegible.
- Permitted limit values have been exceeded.

It is recommended that a device displaying errors or for which an error is suspected be sent back to an authorized service center to be checked.

#### 5 Ex-relevant / Intrinsic Safety Regulations

Use of this device assumes that the operator observes the conventional safety regulations and has read and understood the user manual, safety instructions and safety certificate. The following additional safety regulations must be complied with:

- WARNING: The battery may only be charged outside of the hazardous area.
- WARNING: Only charge the device using charging equipment approved by i.safe MOBILE GmbH.
- WARNING: The device must be protected from impacts.
- WARNING: The device must be protected from excessive exposure to UV light emissions and aggressive acids or alkalis
- WARNING: The device must be protected from high electrostatic charge environments and processes.
- WARNING: The device is intended to be carried over during use in the hazardous area.
- WARNING: The Ear bud hearing protection headphones model H1100G, and H1101G or other accessories which comply with the intrinsic safety entity parameters may be used in the audio jack in the hazardous area.

##### 5.1 Charging and battery

- The device shall only be charged outside ex-hazardous areas using the i.safe PROTECTOR 2.0 USB-C Cable (or other equipment approved by i.safe MOBILE GmbH.)
- Spare battery packs shall only be charged outside ex-hazardous areas using the i.safe PROTECTOR 2.0 USB-C Cable and i.safe MOBILE GmbH approved charging equipment (e.g. charging cradles).
- Battery removal and installation shall only be done outside the ex-hazardous areas.
- Battery package shall not be opened.
- Battery package only be replaced with the same model "B21S".
- Individual (uninstalled) batteries shall not be taken into the ex-hazardous areas.
- Ensure proper installation of the battery before entry into ex-hazardous areas. The battery must be properly mounted and screwed down with all screw covers in place.
- The device shall only be charged at temperatures between +5°C and +40°C.

##### 5.2 Connections and covers

- Physical connections to other equipment are only permitted outside ex-hazardous areas, using the i.safe PROTECTOR 2.0 USB-C Cable (or other equipment approved by i.safe MOBILE GmbH).
- Inside ex-hazardous areas, the covers of the USB connector must be kept closed.
- The audio jack does not need to be covered and shall be connected only to the Ear bud hearing protection headphones model H1100G, and H1101G and other accessories, which comply with the following intrinsic safety entity parameters:

- Connection values for the audio jack AJ:

|                                 |            |                                  |
|---------------------------------|------------|----------------------------------|
| Output voltage:                 | Uo or Voc  | = 4.2 V                          |
| Output current:                 | Io or Isc  | = 274 mA (linear characteristic) |
| Output power (thermal):         | Po or Pout | = 288 mW                         |
| Effective internal capacitance: | Ci         | = 0 µF                           |
| Effective internal inductance:  | Li         | = 0 µH                           |
| Internal resistance:            | Ri         | = 15.323 Ω                       |

- To ensure the integrity of ingress protection (IP), check that all gaskets are present and functional.
- During charging any headset or accessory must be unplugged from the audio jack.

### 5.3 Usage environments

- The device shall not be taken into zones 0 or 20.
- The device shall not be exposed to any aggressive acids or alkalis.
- The device must be protected from impacts with high impact energy, against excessive UV emission and high electrostatic charge processes.
- The permitted ambient operating temperature range is -20°C to +55°C.

### 5.4 Accessories

- Only accessories approved by i.safe MOBILE GmbH shall be used in ex-hazardous areas.
- Accessory camera modules:
  - Camera module removal and installation shall only be done outside the ex-hazardous areas.
  - Uninstalled camera modules shall not be taken into the ex-hazardous areas.
  - Ensure proper installation of the camera module before entry into ex-hazardous areas.
  - The camera module must be properly mounted and screwed down with all screw covers in place.
  - Ensure the connector is clean and free of debris.
  - A camera module is required to be installed.
  - The device must not be used in the ex-hazardous areas without a camera module installed.
- Adjustment of the head strap in ex-hazardous areas is not permitted.

## NAVIGATOR Z1 Connectivity

### Operating Frequency Bands for RealWear NAVIGATOR Z1

Wi-Fi operating frequency band(s) details and EIRP are as follows:

Wi-Fi 2.4G: 18.99dBm

Wi-Fi 5G:

5150-5250-2472: 19.86dBm

5250-5350: 19.35dBm

5470-5725: 19.77dBm

5725-5850: 12.92dBm

Wi-Fi 6G (5945-6425): 13.57dBm for VLP

Bluetooth operating frequency band and EIRP is: 2402-2480: 14.88dBm

### 5G Wi-Fi Connection Information

Operations in the 5250 – 5350 band are restricted to indoor use only.

|   |    |    |    |    |    |    |        |
|---|----|----|----|----|----|----|--------|
|  | AT | BE | BG | HR | CY | CZ | DK     |
|   | EE | FI | FR | DE | EL | HU | IE     |
|   | IT | LV | LT | LU | MT | NL | PL     |
|   | PT | RO | SK | SI | ES | SE | UK(NI) |

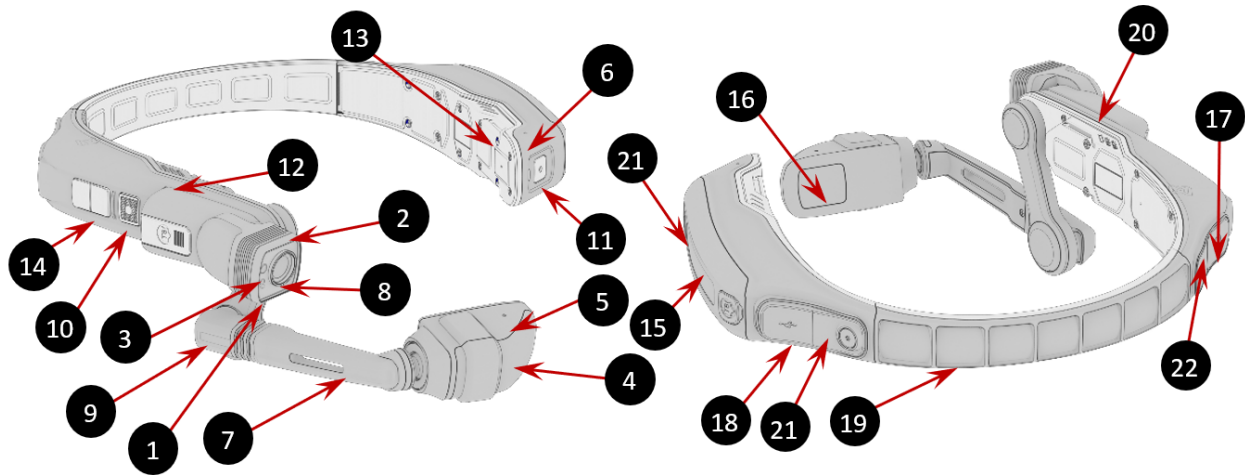
## NAVIGATOR Z1 Box Contents

The list of items in the RealWear NAVIGATOR Z1 box are:

RealWear NAVIGATOR Z1 with preinstalled battery

- Protective Carrying Case
- i.safe MOBILE Charging Cable, USB-C
- Tri-band Strap
- T8 Screwdriver
- NAVIGATOR Z1 Quick Start Guide

## NAVIGATOR Z1 Overview



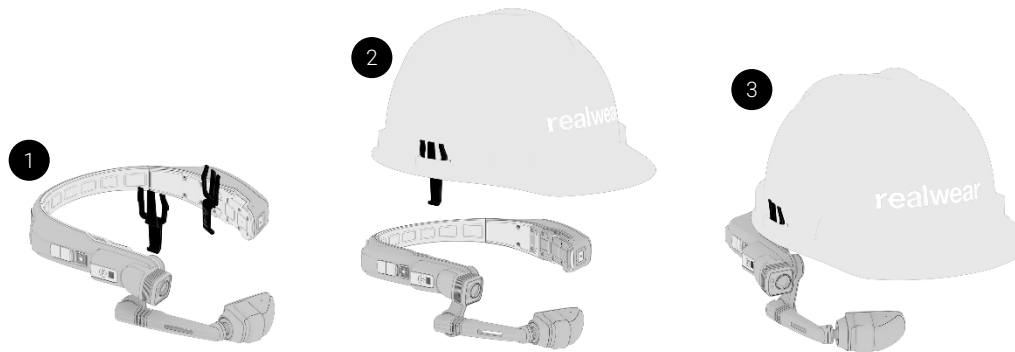
| Callout | Definition                       | Callout | Definition                     |
|---------|----------------------------------|---------|--------------------------------|
| 1       | Active camera indicator light    | 12      | Speaker                        |
| 2       | Shoulder joint                   | 13      | Side accessory clipping points |
| 3       | Flashlight                       | 14      | + (plus) and - (minus) buttons |
| 4       | Display pod                      | 15      | Battery pack                   |
| 5       | Mic A1 (Mic A2 on opposite side) | 16      | Display window                 |
| 6       | Mic B1 (Mic B2 on opposite side) | 17      | 3.5mm audio jack               |
| 7       | Boom arm                         | 18      | USB-C charging power           |
| 8       | Camera                           | 19      | Rear band                      |
| 9       | Elbow joint                      | 20      | Camera module                  |
| 10      | Action button                    | 21      | Battery status indicator       |
| 11      | Power button                     | 22      | Dust Cover                     |

## NAVIGATOR Z1 Setup Guide

### Using the device with a Hard Hat

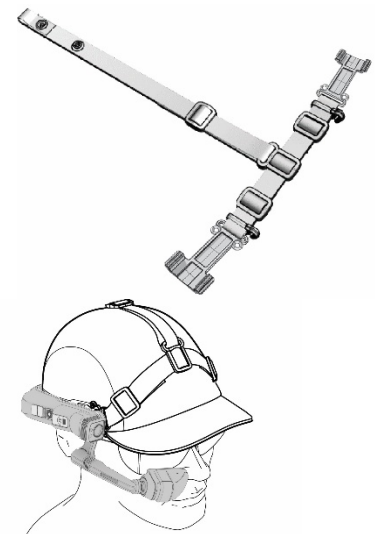
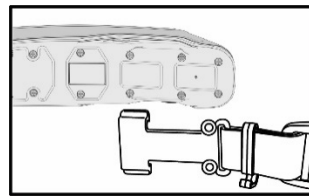
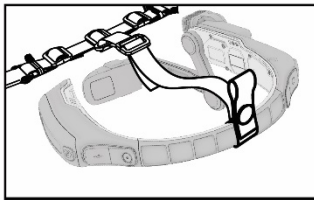
To get hard hat clips, contact your reseller or visit [shop.realwear.com](http://shop.realwear.com).

1. Hook the Hard Hat Clips onto the device and snap them into place.
2. Slide the clips into the hard hat accessory slots; the device should sit outside of the hard hat's harness.
3. Put on the hard hat and if applicable, tighten until secure and comfortable.
4. To remove the REALWEAR NAVIGATOR® Z1 from the hard hat, pinch the clip fingers and push the clip out of the hard hat slots.



### Using the device with a RealWear Tri-band strap

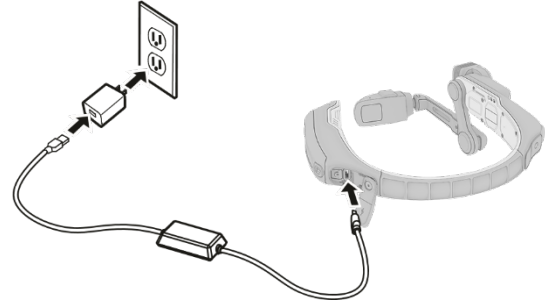
1. Wrap the end of the Tri-Band Strap's top band around the rear of the device and snap closed.
2. Snap the Device clips onto the left and right side device mounting points.
3. Move the adjustment buckles as needed for the best fit.



## Charging the Device

Connect the USB-C charging cable as shown.  
Connect the cable to the i.safe PROTECTOR 2.0 as shown and plug in.

A Red light means the battery is extremely low or dead.  
A Yellow light means the battery is less than 100% and charging.  
A Green light means the battery is full.



### Safety Warning Only use the Provided Charger

The i.safe PROTECTOR 2.0 cable included with the device is a special USB-C cable for data transfer and charging. It includes a safety box that protects the device's safety circuits from power surges. These surges can damage the device and shall occur when connecting the device to computers, wall chargers, car chargers, and other power sources that are not certified or approved as intrinsically safe. It is the only the i.safe PROTECTOR 2.0 approved for charging the device and for moving files to and from the device.

## Setup and Configuration

Use the RealWear ONE App  
Scan this code from your smartphone to download the RealWear ONE App



1. Download the RealWear ONE app from the Appstore for your smartphone OS
2. Launch RealWear ONE app from your smartphone.
3. Follow the steps in the application to connect to your device and configure.

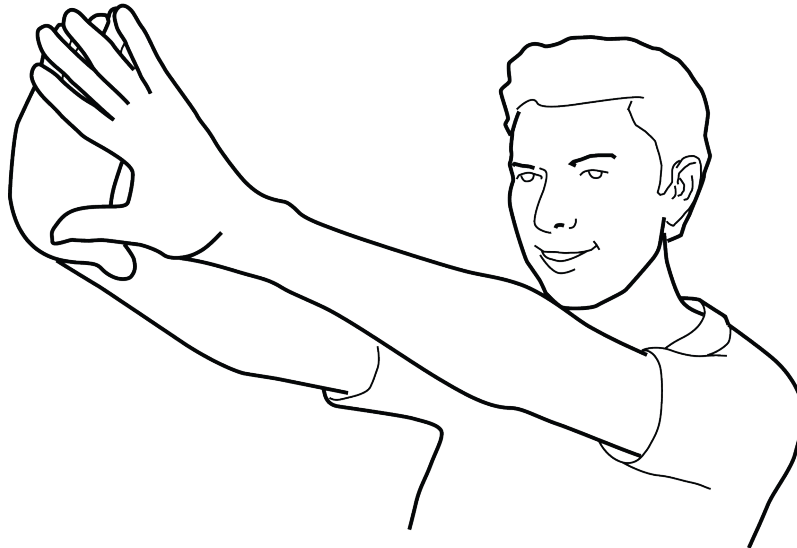
## Check your eye dominance

Eye dominance is the tendency to prefer visual input from one eye to the other. It is best to use your dominant eye when viewing the display.

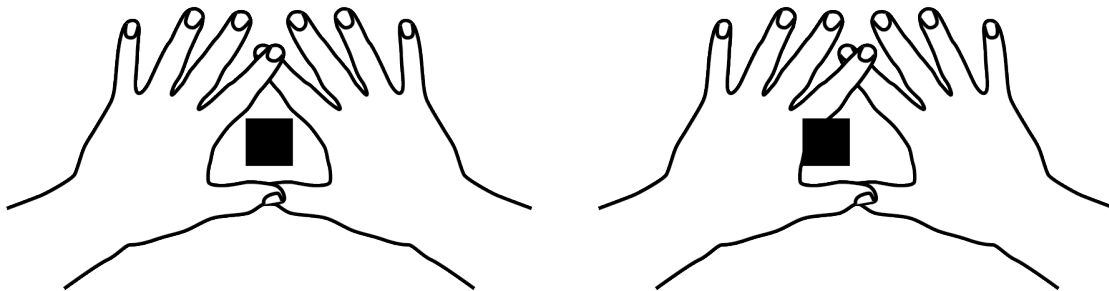
Eye dominance is not related to right- or left-handedness.

To determine which eye is dominant:

1. Form a triangle with your hands placed together at arm's length.



2. With both eyes open, focus on any distant object centered in the triangle (such as a light bulb or door knob).
3. Maintaining focus on the object centered in the triangle and - keeping your head and both hands still - close your right eye.
4. If the object is still in the triangle, you are left-eye dominant.
5. Maintaining focus on the object centered in the triangle and - keeping your head and both hands still - close your left eye.
6. If the object is still in the triangle, you are right-eye dominant

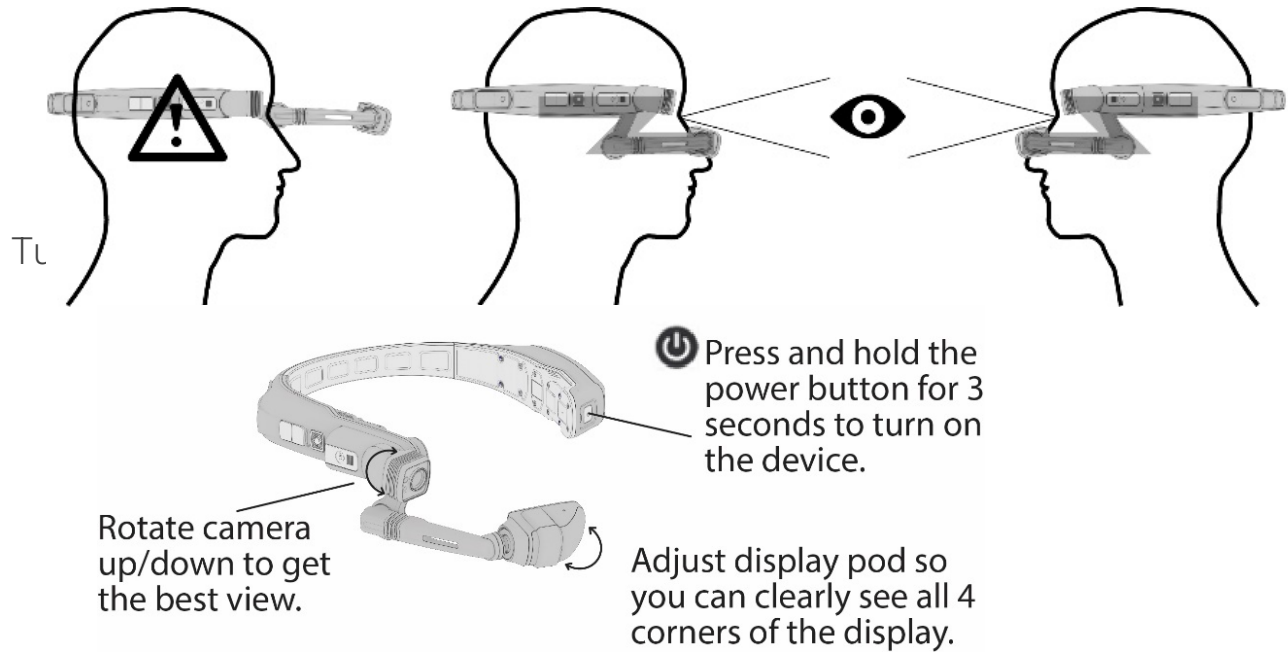


7. If the object is in the triangle with either eye, then you are dominant eye neutral.



## Put on the device

Do not extend the display too far from your eye. Keep the display as close to the eye as possible for the best viewing experience. Adjust the overhead strap such that the device rests horizontally, slightly above the tops of your ears. Position the shoulder and elbow joints into a "Z" shape, below the line of sight, left or right eye.



## Scan the Configuration QR Code from the device

1. The device will automatically launch into configuration mode.
  2. Point the camera at the QR code you generated in Step 1.
  3. The device will detect the QR code and configure the device.
- Note: Once the device connects to Wi-Fi an update of RealWear Device Agent shall occur.

## Say What You See

The device is controlled by voice and head motion. Say what you see on the screen and move your head to navigate. If you get stuck say "SHOW HELP".

## Remote configuration for NAVIGATOR Z1 from web browser

RealWear Cloud is a robust web-based software platform tailored for managing and controlling RealWear Devices. Offering centralized fleet management, remote control, and customized device configurations, it simplifies the user experience with an intuitive interface. Integrated with third-party services and prioritizing security and compliance, RealWear Cloud provides in-depth performance analytics and support, making it an essential tool for optimizing headset utilization across various industries.

You can easily get your device online following RealWear Cloud's intuitive 'get-connected' flow.

If you don't yet have a RealWear Cloud Workspace you can sign up here <https://get-started.realwear.com>

### Get your devices online

1. Login to your RealWear Cloud Account through <https://cloud.realwear.com>
2. Head over to Wi-Fi in the navigation menu
3. Click the plus button
4. Enter your Wi-Fi credentials and mark the network as 'Exportable'
5. Save your settings
6. Click the small QR code next to your Wi-Fi settings
7. Scan this QR code on first boot of the device or using the 'Configuration App' in My Programs
8. Head over to Devices in the navigation bar
9. Click the plus button
10. Click Add a single device
11. Enter the serial number of your device and a device name
12. Click Insert Device  
Your Device shows as Visible when it connects to RealWear Cloud

### RealWear Cloud Basics

In this next section we'll have a look at some of the features of RealWear Cloud including our RealWear App Marketplace

RealWear is constantly updating its web platform, if you need up to date guidance since this document was created you can always check <https://support.realwear.com> where you'll always find the most up to date information

### RealWear App Marketplace

The RealWear App Marketplace is the go-to destination for apps supported on RealWear Devices. Our incredible Software Vendors build amazing apps specifically for RealWear Devices which are available to install in the RealWear App Marketplace here: <https://marketplace.realwear.com>

The RealWear App Marketplace has the latest apps and you can also install them from your device

1. **Install an app (From App Marketplace)**
2. Find the app you want to install
3. Click 'Login to Install'
4. Log in with your RealWear Cloud credentials
5. Click Install; Choose your device
6. Click install

### Install an app (From RealWear Cloud)

1. Login to your RealWear Cloud Account through <https://cloud.realwear.com>
2. Head over to Devices in the navigation menu
3. Click your device
4. Click apps
5. Choose the app you want to install and send it to your device.
6. Your app will be installed in a few minutes providing your device is online and can see RealWear Cloud.

### Updating your Firmware from RealWear Cloud

You can schedule firmware updates at your convenience from RealWear Cloud.

1. Login to your RealWear Cloud Account through <https://cloud.realwear.com>
2. Head over to Devices in the navigation menu
3. Click your Device
4. Click Update Firmware
5. Click a version
6. Choose a date
7. The device will update on the requested date so long as it's powered on, plugged in and connected to the internet

### Remote Control your device from RealWear Cloud

RealWear Cloud offers wireless Remote Control of your device from a desktop web interface.

1. Login to your RealWear Cloud Account through <https://cloud.realwear.com>
2. Head over to Devices in the navigation menu
3. Click your Device
4. Click Cloud Assistance
5. Agree to the terms
6. RealWear Cloud will create a 1to1 remote connection from the web browser to your device.

For the most up to date RealWear Cloud news, features and changes you can always checkout <https://changelog.realwear.com>



## Selecting NAVIGATOR Z1 Interface Language

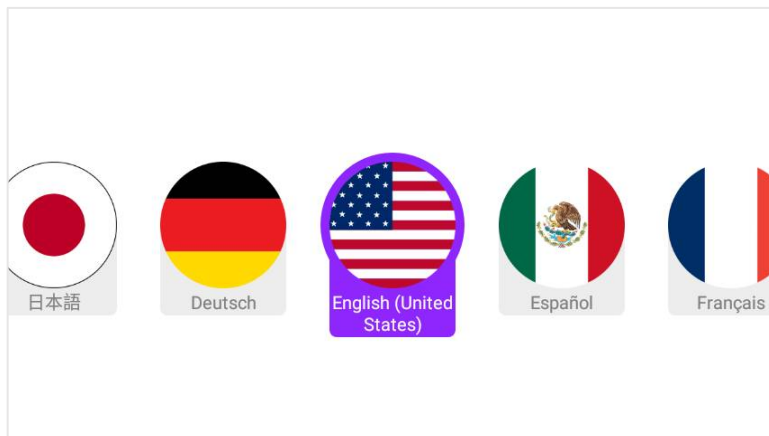
The NAVIGATOR Z1 supports the following languages:

1. Chinese (Cantonese, Mandarin-Simplified and Traditional)
2. Czech
3. Danish
4. Dutch
5. English (American, Australian, British, Indian)
6. French
7. German
8. Indonesian
9. Italian
10. Japanese
11. Korean
12. Norwegian
13. Polish
14. Portuguese (Brazil)
15. Russian
16. Spanish
17. Thai
18. Turkish

To select the user interface language:

Step 1: Press and hold the large, black Action button on the boom-side housing.

Step 2: All the supported languages are displayed as preview, using their respective Country flags:



The device automatically scrolls through the language list and highlights one language at a time, for about two seconds each.

Step 3: When the desired language is highlighted, release the Action button and the device will immediately reconfigure to show commands only in that language.

# NAVIGATOR Z1 Device Care

## Powering Off the NAVIGATOR Z1

RealWear recommends that you power off your NAVIGATOR Z1 device when not in use to conserve battery and ensure the longevity of the device. You can do so in two ways:

### A. Hands Free

1. Say "MY CONTROLS"
2. Say "POWER OPTIONS"
3. Say "POWER DOWN"

### B. Manual

1. Simply press and hold the red power button on the battery-side of the device for three seconds.
2. Release the power button as soon as the tone is heard.
3. A Shutting Down screen will show briefly and then the device will turn off.

## Rebooting the NAVIGATOR Z1

### A. Hands Free

1. Say "MY CONTROLS"
2. Say "POWER OPTIONS"
3. Say "REBOOT"

### B. Manual

1. Follow steps for turning off device
2. After device is fully off and the power light is off, press and hold the power button for 3 seconds. The device will boot up.

## Sleeping/Waking the NAVIGATOR Z1

### A. Hands Free

1. Say "MY CONTROLS"
2. Say "POWER OPTIONS"
3. Say "SLEEP NOW"
4. When asleep, a single, brief press of the Power Button will wake up the NAVIGATOR Z1.

### B. Hands On:

- Press the power button briefly (less than one second) and release to sleep or wake up the device.

## Storing the NAVIGATOR Z1

The NAVIGATOR Z1-1 and NAVIGATOR Z1 are built rugged, but to ensure a long and healthy life:

Power off the device or put to sleep when not in use.

1. Store the NAVIGATOR Z1 device in a cool, dry place.
2. Place the device on a level surface or securely hang it on a wall.
3. If mounted, you can keep the NAVIGATOR Z1 device connected to a hard-hat or bump cap as needed.

## NAVIGATOR Z1 Care Continued

### Cleaning the NAVIGATOR Z1 device

Follow these instructions for cleaning the different areas of the NAVIGATOR Z1-1 or NAVIGATOR Z1:

- The NAVIGATOR Z1 is water resistant so cleaning with a damp cloth and mild soap is appropriate. Ensure that all covers are firmly secured when cleaning. The NAVIGATOR Z1 should never be submerged.
- You shall also use isopropyl alcohol wipes to clean and lightly sterilize the hard surfaces of the NAVIGATOR Z1. Dry surfaces or simply allow to air dry.
- Display and Camera glass: Use a standard micro-fiber cloth to wipe off glass parts. You can use screen cleaner to enable the sharpest possible images.
- Fabric parts: Under normal use the Overhead Strap and Rear Head Pad are expected to eventually wear down and need replacement. Replacement straps and pads can be purchased at <http://shop.realwear.com>. They shall be cleaned with alcohol wipes, but excessive cleaning shall accelerate wear.
- Battery: Should the battery become dirty, clean with a dry cloth alone or in combination with alcohol. If dirty, they shall be cleaned with cloth, cotton swabs, toothbrush, and alcohol if needed. The contacts should not corrode. If the battery appears damaged, replace the battery immediately.
- Battery: The battery contacts must always be kept dry.

### Cleaning NAVIGATOR Z1 Accessories

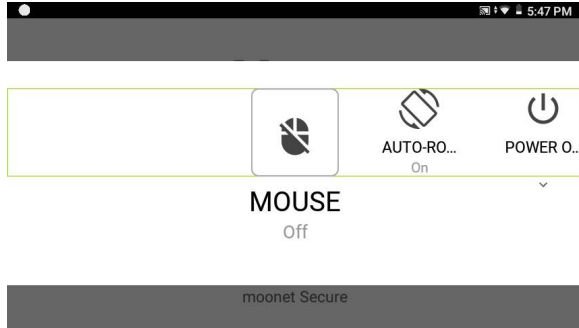
- Hardhat Clips: Hardhat mounting clips are made of plastic and can be cleaned with alcohol wipes or water. Tip: Toothpicks can be used to remove dirt in hard-to-reach areas.
- Tri-band Strap: The Tri-band Strap is comprised of plastic and fabric. It can be cleaned with alcohol wipes, but excess cleaning shall accelerate wear. Replacement straps can be purchased at <http://shop.realwear.com>.
- Hearing Protection Ear Buds: The RealWear Hearing Protection Ear Buds are an electronic component with a metal connector, and cleaning of the buds themselves is not recommended. A polish with a dry or lightly damp cloth should be sufficient. Too much moisture could cause damage to the speakers.
- Foam Tips for Hearing Protection Ear Buds: The foam tips for the ear buds are comprised of memory foam. You shall clean with a dry cloth. Too much moisture could damage the foam. The Foam Tips are considered consumables and are expected to eventually require replacing.
- Replacement parts can be purchased at <http://shop.realwear.com>.

# NAVIGATOR Z1 Interaction Modes

## Control Using Gestures

### Head gesture list control

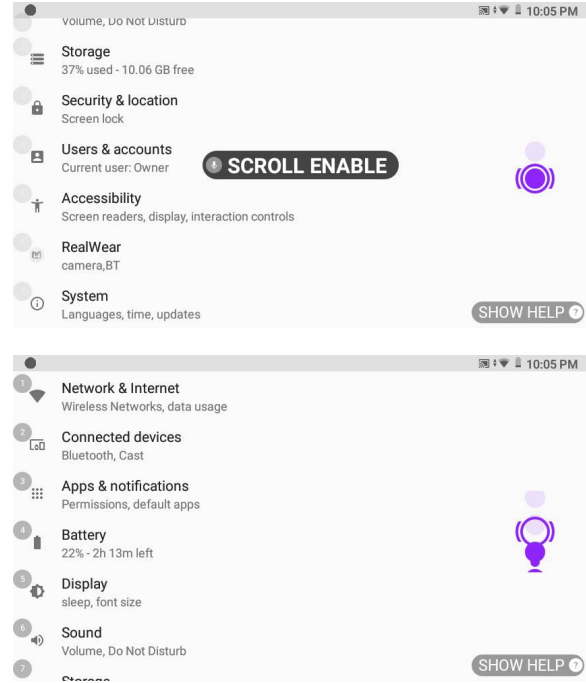
Some interfaces leverage head movement to browse options.



My Controls interface example.

### Scroll Enable

From screens with a scroll view, you can say the command "SCROLL ENABLE".



This will enable vertical head scrolling on list user interfaces such as the settings menu and will take the place of the page up and page down commands. To use, look downward and the screen will scroll down one page at a time.

To stop scrolling, bring your head back up to a level position, so that you are looking straight ahead. When you want to stop using this gesture and return to page up/down commands, say "SCROLL DISABLE".

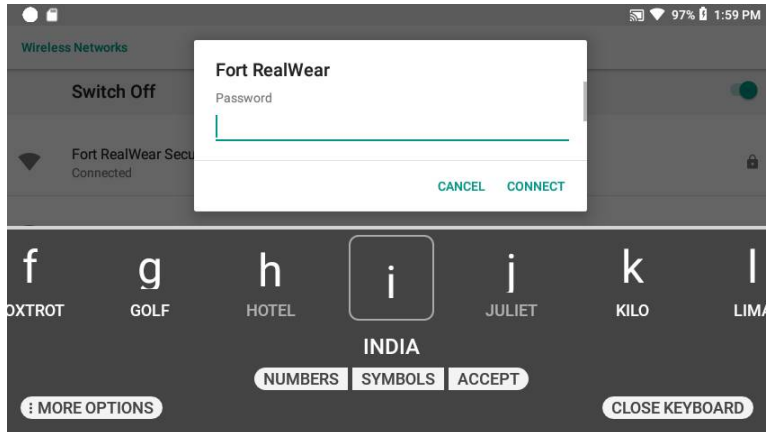
This is extremely useful for quick scrolling to the bottom of a list; when the bottom is reached, quickly say "SCROLL DISABLE".

## NAVIGATOR Z1 Interaction Continued

### Speech Keyboard

Speech Keyboard is the default method by which text shall be entered into a text field using the NAVIGATOR Z1-1 or NAVIGATOR Z1.

Whenever a text entry screen is brought into focus or selected, the hands-free keyboard is displayed automatically.



Speech keyboard provides various input methods:

- Normal Entry Keyboard
- Secure Entry Keyboard
- Scan Code
- Dictation

#### Normal Entry Keyboard

You shall speak the phonetic commands for letters either individually or as a group. For instance, you could enter one character at a time by saying 'ROMEOW', then saying 'ECHO' once the 'R' character has registered, or you could enter an as many letters as is needed with one command.

EXAMPLE: Saying "ROMEOW ECHO ALPHA LIMA WHISKEY ECHO ALPHA ROMEOW" in one breath without break will enter 'realwear' into the text field.

To switch to the Numbers keyboard, say 'NUMBERS'

To switch to the Symbols keyboard, say 'SYMBOLS'

#### Secure Entry Keyboard

When a password field is selected, the Secure Entry keyboard appears. This means that phonetic speech commands are disabled, and the user instead uses head movements, left or right, to highlight a character. The user then says 'Select' to make a selection.

#### Scan Code

Saying the command 'SCAN CODE' opens the barcode reader and allows the user to scan a QR Code for remote keyboard entry using the RealWear Companion app on a mobile phone. This is convenient for passwords and long strings of text. Simply open the RealWear Companion app, select 'Remote Keyboard', enter text and tap on the QR Code. From the NAVIGATOR Z1 keyboard say, 'SCAN CODE', then scan the QR Code visible on the screen of your smartphone. You can also access the 'SCAN CODE' option by saying 'MORE OPTIONS'.



## Speech Keyboard Continued

### Dictation

For Speech-to-Text entry, say 'Dictation', then immediately begin speaking freely. Dictation is cloud-based for all languages, so an internet connection shall be required. Some languages support local dictation as well. You can also access the 'DICTATION' option by saying 'MORE OPTIONS'. For more information, please visit [www.realwear.com/support](http://www.realwear.com/support).

NOTE: If the keyboard becomes hidden or accidentally closed, use the "SELECT ITEM #" command to select the text field again and the speech keyboard will reappear.

If entering a password for WiFi authentication, simply say "PASSWORD" to activate the speech keyboard.

### Keyboard Voice Commands

| Voice Command    | Action  |
|------------------|---|
| "SECURE ENTRY"   | Toggles to Secure Entry mode  |
| "NORMAL ENTRY"   | Toggles to Normal Entry Mode  |
| "SCAN CODE"      | Allows user to scan QR code for text entry<br>To set the zoom level for clear scanning say "Zoom level 1-5". For example, to set the zoom level to 3, say "Zoom level 3". |
| "DICTATION"      | Activates dictation and allows user to enter text based on speech recognition.  |
| "NUMBERS"        | Toggles to the Number Keyboard  |
| "SYMBOLS"        | Toggles to the Symbol Keyboard  |
| "LETTERS"        | Toggles to the Letter Keyboard  |
| "ACCEPT"         | Accepts the entered information and navigates to the next screen in sequence.   |
| "SPACEBAR"       | Inserts a single space.   |
| "BACKSPACE"      | Deletes the last character.   |
| "CLEAR TEXT"     | Clears the text in the Input box.   |
| "CAPS LOCK"      | Toggles between Uppercase and Lowercase letters   |
| "MORE OPTIONS"   | Displays the 'NORMAL ENTRY'/'SECURE ENTRY', 'DICTATION' and 'SCAN CODE' commands  |
| "CLOSE KEYBOARD" | Closes the Speech Keyboard  |
| "SHOW HELP"      | Displays pop-up window with the help for commands associated with the current screen.   |

## NAVIGATOR Z1 Interaction Continued

### Voice Control

#### Introducing WearHF™

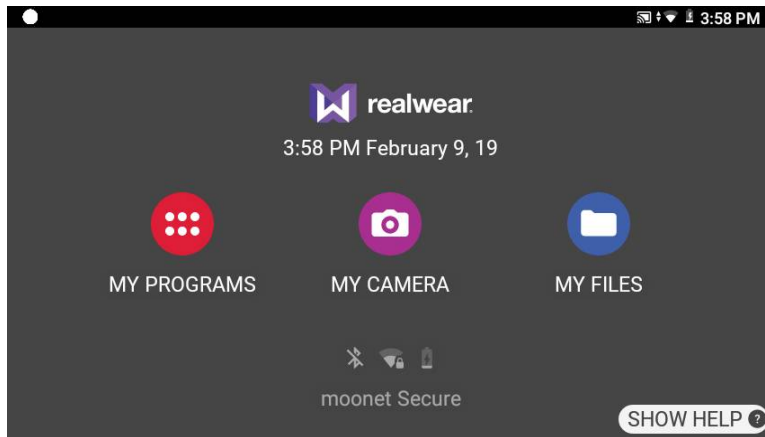
WearHF™ is an innovative software solution that enables you to use your RealWear NAVIGATOR Z1 as a hands-free device.

It is easy to use and loaded with intuitive functions.

#### Speech Recognition – Say What You See

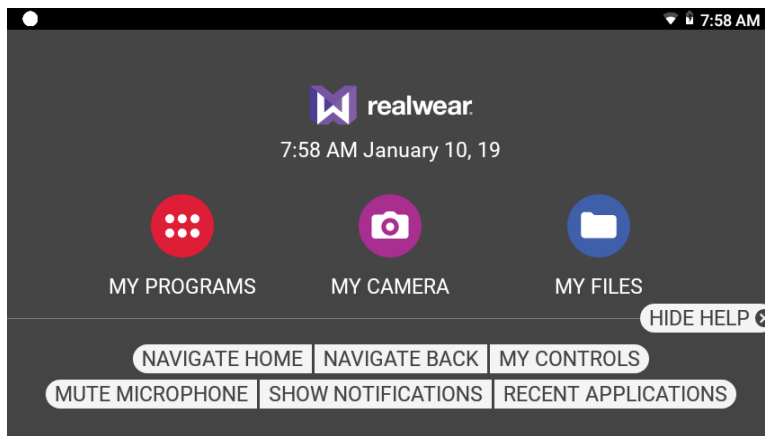
NAVIGATOR Z1 devices operate based on speech recognition. Instead of pressing or tapping a control button on the screen, all you need to do is speak the name of the respective control. NAVIGATOR Z1 devices use the latest technology for advanced noise cancellation and speech recognition which work even in the harshest noisy environments. It can recognize many different languages and accents and can detect the command even if you speak in a low voice.

All the commands associated with the specific screen should be displayed clearly on the screen, usually in ALL CAPITAL LETTERS. You can operate the device by speaking the name of any control. For example, the Home Screen has large icons with respective names such as "MY PROGRAMS" or "MY FILES". To access these applications, you can say the application name and the corresponding screen is launched.



#### Anytime Access Help

You can access the help information regarding the commands associated with a particular screen, with "SHOW HELP" command. The "SHOW HELP" command is displayed on all the screens. The help screen is displayed as a pop-up window. You can either say the command you desire or say "HIDE HELP" to close the pop-up window. Even when the help window is closed, the NAVIGATOR Z1 will continue to listen for and respond to those commands.



# NAVIGATOR Z1 Ownership Information

*All communications, notices and legal agreements have the meaning provided in the English language; translations into other languages are for convenience only. If there is any discrepancy between the translated and English version, the English version will prevail.*

## Models Covered

The information contained herein covers the following REALWEAR NAVIGATOR Z1 model(s):  
T21S

You can find the model name on the NAVIGATOR Z1 one of the two device labels on the rear inner band. Serial Numbers are 15 characters in length.

You can find E-label by MY PROGRAMS -> ABOUT DEVICE -> VIEW REGULATORY.

## *Ownership Information Continued*

# NAVIGATOR Z1 Regulatory and Compliance Statements

**WARNING:** Changes or modifications made to this equipment not expressly approved by RealWear, Inc. for compliance could void the user's authority to operate the equipment.

### FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device shall not cause harmful interference, and (2) this device must accept any interference received, including interference that shall cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, shall cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures: • Reorient or relocate the receiving antenna. • Increase the separation between the equipment and receiver. • Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. • Consult the dealer or an experienced radio/TV technician for help.

### FCC Caution

1. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
2. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
3. Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

### ISED Statement – English

1. This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
  - This device shall not cause interference, and
  - This device must accept any interference, including interference that shall cause undesired operation of the device
2. This Class B digital apparatus complies with Canadian ICES-003.
3. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter, except tested built-in radios.
4. The Country Code Selection feature is disabled for products marketed in the US/Canada.
5. Devices shall not be used for control of or communications with unmanned aircraft systems

### ISED Statement – Français

1. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
  - l'appareil ne doit pas produire de brouillage, et
  - l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement
2. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
3. Cet appareil et son antenne ne doivent pas être situés ou fonctionner en conjonction avec une autre antenne ou un autre émetteur, exception faites des radios intégrées qui ont été testées.
4. La fonction de sélection de l'indicatif du pays est désactivée pour les produits commercialisés aux États-Unis et au Canada.
5. Les dispositifs ne doivent pas être utilisés pour commander des systèmes d'aéronef sans pilote ni pour communiquer avec de tels systèmes.

## *Regulatory and Compliance Continued*

### ISED Statement – FOR WLAN 5GHZ DEVICE

#### Caution

1. Operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.
2. The maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall comply with the e.i.r.p. limit.
3. The maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate.
4. The worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in Section 6.2.2(3) shall be clearly indicated.
5. Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

#### Avertissement

1. Les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.
2. le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la limite de p.i.r.e.
3. le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5725-5825 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.
4. les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la p.i.r.e. applicable au masque d'élévation, et énoncée à la section 6.2.2 3), doivent être clairement indiqués.
5. De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

Ownership Information Continued

Declaration of Conformity

EU Regulatory Conformance

Hereby, We, i.safe MOBILE GmbH declare that the radio equipment type T21S is in compliance with Directive 2014/53/EU.



EU Declaration of Conformity

Manufacturer:

Name: i.safe MOBILE GmbH  
 Address: i\_Park Tauberfranken 10, 97922 Lauda-Koenigshofen, Germany

Radio Equipment:

Model: T21S  
 Brand: i.safe MOBILE, realwear  
 Description: Head Mounted Tablet  
 Radio-related Hardware Version: A  
 Radio-related Software Version: 1.0.4-14-T.NAVIGATOR-Z1.S  
 Supplied Accessories and Components: USB cable, Battery

| Specification of Accessory |            |               |            |               |
|----------------------------|------------|---------------|------------|---------------|
| Battery                    | Brand Name | i.safe MOBILE | Model Name | B21S          |
| USB Cable                  | Brand Name | i.safe MOBILE | Model Name | PROTECTOR 2.0 |

We, i.safe MOBILE GmbH, declare under our sole responsibility that the product described above is in conformity with the relevant Union harmonization legislations:

RE Directive (2014/53/EU), RoHS Directive (2011/65/EU)

The following harmonized standards and/or other relevant standards have been applied:

1. **Health and Safety (Article 3.1(a) of the RE Directive)**
  - EN 50360:2017
  - EN 50566:2017
  - EN IEC 62311:2020
  - EN 62209-2 :2010
  - EN 50665:2017
  - EN IEC/IEEE 62209-1528: 2021
  - EN IEC 62368-1:2020+A11 :2020
  - EN 50332-2:2013
2. **Electromagnetic compatibility (Article 3.1 (b) of the RE Directive)**
  - ETSI EN301489-1 V2.2.3
  - ETSI EN 301 489-3 V2.3.2
  - Draft ETSI EN301489-17 V3.2.6
  - ETSI EN 301 489-19 V2.2.1
3. **Radio frequency spectrum usage (Article 3.2 of the RE Directive)**
  - ETSI EN 300 328 V2.2.2
  - ETSI EN 301 893 V2.1.1
  - ETSI EN 300 440 V2.2.1
  - ETSI EN 303 687 V1.1.1
  - ETSI EN 303 413 V1.2.1
4. **RoHS Directive (2011/65/EU)**
  - EN IEC 63000:2018

The notified body (Name: Sporton International (USA) Inc., ID: 2907) performed the conformity assessment according to Annex III against the essential requirement Article 3.1(a), 3.1(b), 3.2 of the RE Directive and issued the EU-type examination certificate (Ref. No.: SN23C0165).

Signed for and on behalf of: i.safe MOBILE GmbH

Place: i\_Park Tauberfranken 10, 97922 Lauda-Koenigshofen, Germany, Date: October 19, 2023

Name: Dirk Amann, Function: Certification Manager, Signature:

## UK Regulatory Conformance

Hereby i.safe MOBILE GmbH declares that the radio equipment type T21S is in compliance with UK Radio Equipment Regulations 2017 (RER 2017 (SI 2017/1206)). The full text of the UK Declaration of Conformity is available at the following internet address: [RealWear Navigator® Z1 - Knowledge Base](#)

The local representative is RealWear, Stansted House, Stansted Park, Rowlands's Castle, Hampshire, P096DX



### UK Declaration of Conformity

**Manufacturer:**

**Name:** i.safe MOBILE GmbH  
**Address:** i\_Park Tauberfranken 10  
97922 Lauda-Koenigshofen, Germany

**Radio Equipment:**

**Model:** T21S  
**Brand:** i.safe MOBILE, realwear  
**Description:** Head Mounted Tablet  
**Radio-related Hardware Version:** A  
**Radio-related Software Version:** 1.0.4-14-T.NAVIGATOR-Z1.S  
**Supplied Accessories and Components:** USB cable, Battery

| Specification of Accessory |            |               |            |               |
|----------------------------|------------|---------------|------------|---------------|
| Battery                    | Brand Name | i.safe MOBILE | Model Name | B21S          |
| USB Cable                  | Brand Name | i.safe MOBILE | Model Name | PROTECTOR 2.0 |

We, i.safe MOBILE GmbH, declare under our sole responsibility that the above product is in conformity with the relevant statutory requirements: RER 2017 (SI 2017/1206), RoHS regulations 2012 (SI 2012/3032)

The following harmonized standards and/or other relevant standards have been applied:

**1. Health and Safety (Regulation 6.1a)**

- EN 50360:2017
- EN 50566:2017
- EN IEC 62311:2020
- EN 62209-2 :2010
- EN 50665:2017
- EN IEC/IEEE 62209-1528: 2021
- EN IEC 62368-1:2020+A11 :2020
- EN 50332-2:2013

**2. Electromagnetic compatibility (Regulation 6.1b)**

- ETSI EN301489-1 V2.2.3
- ETSI EN 301 489-3 V2.3.2
- Draft ETSI EN301489-17 V3.2.6
- ETSI EN 301 489-19 V2.2.1

**3. Radio frequency spectrum usage (Regulation 6.2)**

- ETSI EN 300 328 V2.2.2
- ETSI EN 301 893 V2.1.1
- ETSI EN 300 440 V2.2.1
- ETSI EN 303 687 V1.1.1
- ETSI EN 303 413 V1.2.1

**4. RoHS regulations 2012 (SI 2012/3032)**

- EN IEC 63000:2018

The UK Approved body Sporton International (USA) Inc., with number 2907 has performed a conformity assessment in accordance with the procedures in Schedule 3 Module B against the essential requirements Regulation 6.1a, 6.1b, and 6.2 of the RER 2017 (SI 2017/1206), and issued the Type examination certificate: SN23A0097

**Signed for and on behalf of:** i.safe MOBILE GmbH

**Place:** i\_Park Tauberfranken 10, 97922 Lauda-Koenigshofen, Germany

**Date:** October 19, 2023

**Name:** Dirk Amann, **Function:** Certification Manager, **Signature:**

## NAVIGATOR Z1 Specific Absorption Rate (SAR) Information

### Radiation Exposure Statement – Europe

No minimum separation distance needs to be maintained between the user's body and the device, including the antenna during body-worn operation to comply with the RF Exposure requirements in Europe.

The limit recommended by RED is 2W/kg average over ten (10) gram of tissue for Head SAR.

The limit recommended by RED is 4 W/kg average over ten(10)gram of tissue for Limbs SAR.

The highest SAR value of the Navigator for use:

·Head SAR:0.110W/kg(10g)

·Limbs SAR:0.515 W/kg(10g)

### Radiation Exposure Information – United States

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the United States.

The exposure standard for wireless employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg.

The FCC has granted an Equipment Authorization for this model device with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines.

·Head SAR:0.69W/kg(1g)

### Radiation Exposure Statement – Canada

The product complies with the Canada portable RF exposure limit set forth for an uncontrolled environment and is safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

### Déclaration d'exposition aux radiations

Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrôlé. Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.



*Ownership Information Continued*

## NAVIGATOR Z1 Limited Warranty and Software License

For RealWear's terms of sale and warranty information, please visit <https://www.realwear.com/legal/terms-of-sale/>