

TREON

4221

User Manual

User Manual for Radio Certification purposes

October 2025

V1.1

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1 General

1.1 Product Description

4221 is a device designed for monitoring conditions inside a confined area such as a trailer or container. 4221 uses several integrated sensors for monitoring environmental conditions as well as changes such as door state and communicates the data using 2.4GHz radio. It has an integrated battery pack (Li-SOCl₂ battery) for energy storage, which is not rechargeable.

1.2 Radio Certification information

The radio certification related information and naming of the 4221 can be found below:

PMN: 4221

HVIN: 4221

FCC ID: 2AR86-AS42

Contains FCC ID: 2AQ6KA1201

Manufacturer Information:

Treon Oy, Visiokatu 1, 33720 Tampere, Finland

2 Operating conditions

The operating conditions of 4221 can be found in the table below.

	Min	Max
Operating voltage [V]	2.2	3.6
Extended Operating temperature [°C]	-30	+75
Current consumption	50 uA	20 mA

Maximum clock frequency is 32MHz and sleep clock is 32kHz.

2.1 Temperature information

	4221
Storage temperature	Recommended: -20°C to +30°C • Ensure battery health during storage • Store in dry, cool and ventilated conditions
Operating temperature	Normal operating temperature range • -10°C to +75°C • Operation dependent on the internal battery charge level Limited operating temperature range • -30°C to -10°C • Device operations cannot be guaranteed in cold conditions

CONDITIONS OF USE

Be aware of potential electrostatic charging hazard.

3 Keys and parts

Installation kit:

- 4221
- Rivets



4 Installation

The following guidelines cover the required installation instructions for installing 4221 to container.

Safety:

Before commencing the installation, ensure correct PPE (Personal Protective Equipment) is worn.

Tools:

- Drill
- Drilling template
- Drill bit Dia 4,9 mm
- Sealing compound
- Riveting tool

Mounting 4221

Drill 4,9 mm holes to container door using drilling template. Mount 4221 and Repeater to door with rivets. Seal holes with sealing compound.

5 Led indication legend

4221 Pattern	Explanation
Green blinking	Device is starting up and/or entering onboarding mode
Green solid	Device is operating normally and able to report to GW
Red – Green blinking sequence	Device is not able to connect to GW
Red solid	Device has not finished the onboarding procedure
Red blinking	Device has an error

6 Product and compliance information

Important

For important information on the safe use of this device, read the Safety Guidance part.

Manufacturer Information:

Treon Oy, Visiokatu 1, 33720 Tampere, Finland

<https://www.treon.fi>

6.1 FCC Statement

FCC

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications made to the device not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

Note: 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, may 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 or more 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.

Radiofrequency radiation exposure information:

This device complies with the radiation exposure limits prescribed for an uncontrolled environment for fixed and mobile use conditions. This device should be installed and operated with a minimum distance of 20 cm between device and the body of the user or nearby persons.

6.2 Labelling

Label example, containing the FCC information, of 4221 is presented below. Label is located on the bottom of the device.



*Figure 1. Label example of 4221 – Size not in scale.
Actual label size 2 x 1 inch.*

7 Safety Guidance

7.1 Introduction

Read these simple guidelines. Not following them may be dangerous or against local laws and regulations. For further information, support requests and questions can be sent to: support@treon.fi.

7.2 Battery safety

4221 internal battery information:

- Non-chargeable Li-SOCl₂ battery
- Nominal operating voltage 3.6V
- Nominal capacity 8500mAh
- Recommended storage temperature for battery health: up to +30°C



Disposal of the device into fire or a hot oven, or mechanically crushing or cutting of the device can result in an explosion.



Leaving the device in an extremely high temperature surrounding environment can result in an explosion or the leakage of flammable liquid or gas.



The device subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

7.3 Care and maintenance

Handle the device with care. The following suggestions help keeping the device operational.

- Do not open the device (other than as instructed).
- Unauthorized modifications may damage the device and violate regulations governing radio devices.
- Do not drop, knock, or shake the device. Rough handling can break it.
- To avoid electrostatic charging use only a moist, soft, clean cloth to clean the surface of the device. Do not clean the device with solvents, toxic chemicals, or strong detergents as they may damage the device and void the warranty.
- Do not paint the device. Paint can prevent proper operation.
- Device is dust and splash proof and classified as IP67 and IP69K. However, it is not recommended to immerse it in water.

7.4 Damage

If the device is damaged contact Treon Support. Only qualified personnel may repair this device.

7.5 Small children

The device is not a toy. It may contain small parts. Keep them out of the reach of small children.

7.6 Interference with medical devices

The device may emit radio waves, which could affect the operation of nearby electronics, including cardiac pacemakers, hearing aids and defibrillators. If device user has a pacemaker or other implanted medical device, do not use the device without first consulting a doctor or the manufacturer of the medical device. Maintain a safe distance between the device and the medical devices and stop using the device if observing persistent interference with the medical device.

7.7 Storage

Always store and use the device as instructed and with covers attached. Recommended storage temperature should not exceed +30°C.

7.8 Recycling

Check the local regulations for proper disposal of electronic products.

The Directive on Waste Electrical and Electronic Equipment (WEEE), which entered into force as European law on 13th February 2003, resulted in a major change in the treatment of electrical equipment at end-of-life. The purpose of this Directive is, as a first priority, the prevention of WEEE, and in addition, to promote the reuse, recycling and other forms of recovery of such wastes so as to reduce disposal.



— The crossed-out wheellie-bin symbol on the product, battery, literature, or packaging reminds that all electrical and electronic products and batteries must be taken to separate collection at the end of their working life. Do not dispose of these products as unsorted municipal waste: take them for recycling. For info on the nearest recycling point, check and contact with the local waste authority.