

TR V05-01 Product Specification and Manual

I. Product Overview

TR V05-01 is an asset tracking device designed for global supply chain management, specifically engineered for reusable transport containers (including plastic crates and pallets, etc.). Tracker V5-PECO provides enterprises with end-to-end visible logistics tracking solutions, significantly improving asset management efficiency and security.

II. Product Highlights

- Optimized power management system supports multiple battery types, with theoretical lifespan of 5 years
- Wi-Fi fingerprinting + BLE-assisted positioning
- Record temperature data
- store up to 6 months' worth of tracking data in case of cellular network coverage outages
- Upload data by connecting over the LTE CAT1 cellular network in the North America and third-party WiFi APs.
- IP67 waterproof and dustproof, 2-meter drop protection, and suitable for harsh industrial environments

III. Detailed Technical Specifications

3.1 Core Processing Unit

Item	Specification
Main Controller	ESP32-WROOM-32UE (supports 2.4 GHz Wi-Fi)
Firmware Compatibility	Existing Sensize firmware, no redevelopment needed

3.2 Low-power Bluetooth Subsystem

Item	Specification
Bluetooth Chip	Renesas DA14535
Operating Mode	Primarily broadcast mode, can receive data from surrounding BLE devices

Item	Specification
Broadcast Interval	Configurable (default 1 second, adjustable based on power consumption requirements)
Communication Interface	UART connection with main controller
Antenna Solution	SR4L034-R (4G), SR4W089 (Bluetooth), Airgain N03SZAAA-T2M62-PK1-G275U (WIFI)

3.3 Cellular Communication Module

Tracker V6 offers multiple regional versions to optimally meet different market requirements:

Version	Applicable Region	Recommended Module	Band Support
North America Edition	USA, Canada, Mexico	Quectel EG800Q-NA	LTE CAT1

SIM Card Support:

- Standard: MFF2 eSIM (5mm x 6mm, soldered, high reliability)
- Optional: Plastic SIM card holder (for R&D testing and special scenarios)

3.4 Positioning and Environmental Monitoring

Sensor	Model	Function Description
Accelerometer	ST LIS3DHTR	Supports motion detection, free-fall recognition, device orientation determination
RTC Clock	Renesas ISL1208	High-precision timing, built-in watchdog function, with 32KHz crystal
Temperature Sensor	High-precision thermistor	Measurement range: -20℃~+80℃

Sensor	Model	Function Description
Wi-Fi Scanning	ESP32 integrated	Scans surrounding APs for Wi-Fi fingerprint positioning

3.5 Storage and Data Management

Item	Specification
Storage Capacity	Can store 6 months of tracking data
Data Content	Location information, timestamp, temperature data, BLE device data, device status

3.6 Power System

Item	Pallet Tracking Edition
Battery Type	8 x AA Alkaline batteries
Battery Capacity	-
Operating Voltage	3.0V
Standby Current	<50μA
Average Operating Current	-
Theoretical Lifespan	5 years (depends on usage frequency and environmental temperature)
Battery Replacement	No replaceable

3.7 Operating Environment Parameters

Item	Parameter
Operating Temperature	-20℃ ~ +80℃
Storage Temperature	-20℃ ~ +80℃
Waterproof Rating	IP67
Drop Resistance	2-meter drop onto concrete floor

IV. Mechanical Structure and Installation

4.1 Enclosure Structure

- **Dimensions:** L:445mm X 30mm X 17mm
- **Installation Method:** Compatible with standard wooden pallets, can be fixed using screws
- **Material:** Reinforced polycarbonate, excellent impact resistance
- **Color:** Pantone 7499 C

V. Application Scenarios

5.1 Pallet Circulation Management

- Track pallet movement paths
- Calculate pallet utilization rates
- Prevent pallet loss

VI. Usage Guide

6.1 Device Activation

1. Check device appearance for damage, ensure SN label is clear
2. Battery pre-installed, and device automatically enters initialization and completes network registration and data synchronization

6.2 Installation and Fixing

- Fix using screws or zip ties through mounting holes of the pallet blocks

6.3 Maintenance and Care

- Regularly check enclosure for damage, ensure sealing is intact

VII. Precautions

7.1 Battery Safety

- Strictly prohibited to charge, short-circuit, heat, or disassemble batteries
- Do not dispose of batteries in fire to avoid explosion
- Dispose of waste batteries according to local environmental regulations

7.2 Operating Environment

- Although the device is waterproof, prolonged immersion is not recommended
- Avoid strong impact or compression of the device to prevent damage to internal components
- Operating temperature range -20℃~+80℃, exceeding this range may affect performance

7.3 RF Safety

- Device complies with international electromagnetic radiation standards, harmless to human body under normal use
- Maintain at least 20cm distance from human body during installation
- **FCC Warning**
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- 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.
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- NOTE 1: 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.
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- NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
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- RF Exposure Statement
- To maintain compliance with FCC'S RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm between the radiator and your body. This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.