

Feibot Active Power Tag User Manual

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1. Product Description

The AT01 PowerTag is specifically designed for high-speed races such as cycling and triathlons, offering exceptional accuracy and sensitivity. It is available in two models: reusable version (can open cover and change battery) and the fully sealed version (potted, can't open). The primary difference between them is whether the battery can be replaced. The reusable PowerTag has a weaker waterproof performance and is not recommended for swimming events, but the replaceable battery feature significantly extends the tag's lifespan. The fully sealed PowerTag boasts excellent waterproof performance and is suitable for races in almost any environment (water and snow).

Feature:

Reusable Power Tag

Long Battery Life: Features a high-capacity lithium battery offering up to 3 years of operation under typical usage conditions.

Lightweight: Dimensions are 42mm x 35mm x 13.5mm, and it weighs only 16 grams, making it easy to wear and use.

Flexible Mounting Options: Can wear through wristband, or mount on bike through tag holder

Replaceable Battery: The tag is equipped with a replaceable battery, allowing for easy maintenance and ensuring long-term usability.

2. Operational Principle

This active tag is essentially a semi-passive, semi-active tag. It normally remains in a sleep state and is activated by a specific 125KHz low-frequency signal. Once activated, it starts working and transmits data via 2.4G. In summary, it uses low-frequency to wake up and high-frequency to transmit data.

3. Mounting Instructions

Can wear or ankle using the elastic strap, can also mount on bike tube thorough the tag holder.



4. Operation Instructions

4.1 Activating the Tag

- a) Activation Orientation: The tag is directional, must be placed vertically to have the best performance.
- b) Activation: When the tag passes the low frequency cable loop connected to the active reader, it will be activated. The activation range varies when the loop width and activating power changes.

4.2 Using the Tag in Different Modes

- a) Sleep Mode: The active tag is normally in sleep mode. In this state, only the 125KHz low-frequency circuit is in detection mode, while the 2.4G high-frequency circuit is in deep sleep mode, with a total power consumption of approximately 5uA.
- b) Active Mode: When the tag passes through the low-frequency cable loop of the A400 reader and is activated by the low-frequency signal, it enters active mode. Using an anti-collision algorithm, the tag transmits data via the 2.4G high-frequency chip. In this mode, the tag's total power consumption is approximately 7mA.

5. Battery

5.1 Battery Selection

The battery is the power supply for the active tag, which can ensure the stable operation of the tag. Considering the size and weight of the active tag, we

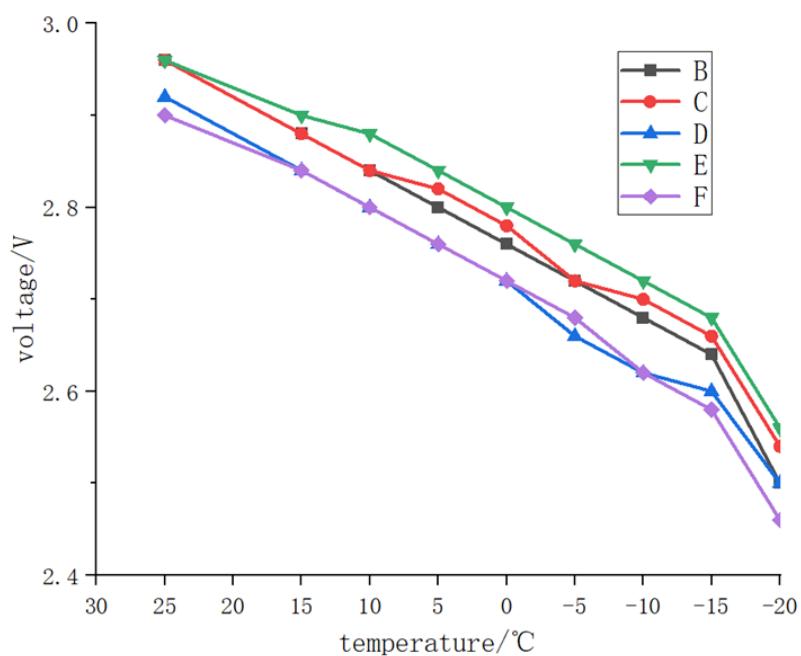
choose the CR2032 button cell battery, rated at 3.0V with a typical capacity of 220mAh.

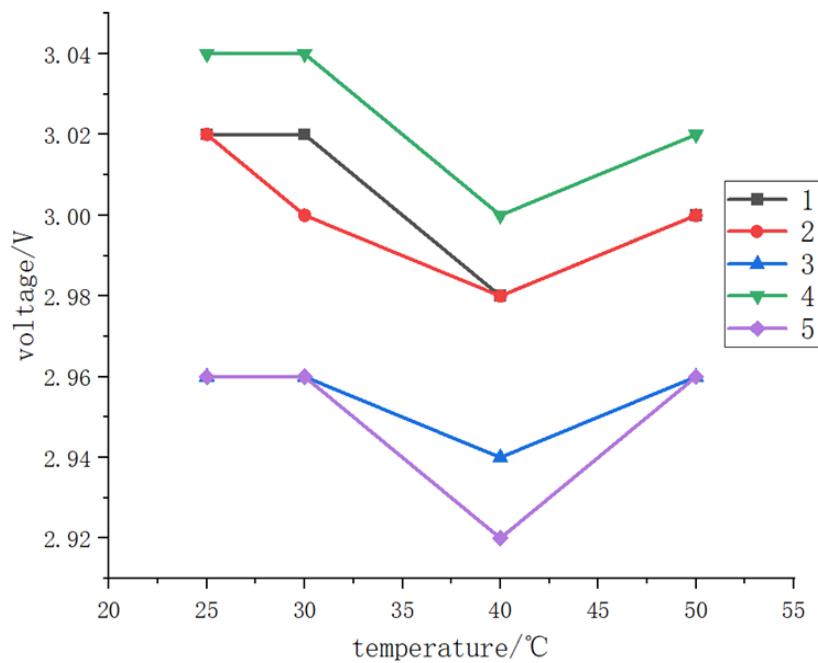
5.2 Battery Capacity Monitoring

The CR2032 button cell battery is sensitive to environmental temperature, especially in low-temperature environments. Figures 1 and 2 show the variation trends of battery capacity for five tags under different environmental temperatures. The data acquisition method is as follows: place the active tags in a temperature chamber, activate them when the chamber reaches the set temperature, and then measure their battery capacity. From the figures, it can be observed that lower temperatures result in greater battery capacity reduction for active tags; high temperatures have a relatively minor impact on battery capacity.

Due to the sensitivity of active tag battery capacity to low temperatures, the following should be noted during use:

- 1) Check the battery capacity of the active tag at the normal operating temperature for the event. If the tag's battery capacity is below 2.3V, it is not recommended for use.
- 2) If on-site battery capacity checks are not feasible, you can perform the checks at room temperature. Estimate the battery capacity by considering that for every 10°C drop in temperature, the tag's battery capacity decreases by 0.1V.
- 3) It is not recommended to use tags in environments with temperatures below -20°C.





6.Storage

Understanding the operating principles of active tags and the factors affecting battery life, consider the following points for proper storage:

- 1) Store in a shaded, well-ventilated, and dry indoor environment, ideally at temperatures above 15°C.
- 2) Keep away from AC power sources, chargers, and environments that may generate electromagnetic interference.
- 3) Avoid proximity to RF transmission systems, especially those using 125KHz technology, such as PKE and access control systems.

7. Technical Specification

Version	Reusable Power Tag
Accuracy	0.006s
Resolution	0.001s
Max Speed	150km/h
Max Detection Height	2m
Life Span	3 years
Activation Count	100 000
Dimension	42*35*13.5mm

Weight	15.5±0.3g
Antenna	3D directional

8. Remarks

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.