

Instruction Manual

Product Name: WakeCap Asset Node
Product Models: WC-NODE-H, WC-NODE-S, WC-NODE-F
Document No.: HW-SPEC-TS-WC-NODE-H-S-F



Revision History

Revision	Date	Description	Author
1.0	2025-09-04	Initial Release	Rami Nassouh

1. Product Description

The Helmet Knob Asset Node integrates WakeCap's electronics into a custom knob that replaces the standard ratchet knob at the back of a construction helmet. It provides worker tracking, attendance, and safety monitoring.

The Side Accessory Asset Node contains the same WakeCap electronics as the knob but housed in a clip-on enclosure for helmet accessory slots. It supports interchangeable clips for compatibility with different helmet brands.

The FOB Asset Node houses WakeCap's electronics in a compact fob enclosure, allowing attachment to lanyards, tools, equipment, or vehicles for asset tracking and safety monitoring.

2. Technical Specifications

Item	Description		
	WC-NODE-H	WC-NODE-S	WC-NODE-F
Dimensions	43 × 43 × 34 mm	52.5 × 52.5 × 21 mm	59 × 43 × 21 mm
Design	Plastic housing with o-ring sealing		
Connectivity	BLE 2.4 GHz SoC, ARM Cortex-M4F, +4 dBm		
NFC	Embedded NFC Type 2 Tag (ISO 14443-3A)		
Device ID	Unique 8–10 digit identifier		
Motion Sensing	12-bit ±4g accelerometer		
Battery	1000 mAh Li/MnO ₂ CR2477 coin cell, replaceable, ~1.5 year life (typical)		
Input	Tactile push button		
Output	Buzzer		
Operating Temp	pending		
Ingress Protection	pending		
Certifications	pending		

3. Typical Use Cases

- Attendance tracking
- Impact, free fall and activity detection
- Location tracking (5–20 m accuracy)
- NFC tap-to-identify
- SOS request via tactile button
- Mustering signal via buzzer

4. Maintenance Procedures

4.1 Preventive Guidelines

- Inspect housing for cracks, loose parts, or water ingress.
- Avoid solvents, oils, or high-pressure water jets.
- Verify button, NFC response, and buzzer output during checks.

4.2 Battery Replacement

Battery Type: CR2477 Lithium coin cell (non-rechargeable)

Estimated Life: ~1.5 years

Steps:

1. Move device to a safe maintenance area.
2. Open housing screws and access PCB compartment.
3. Remove old cell and dispose of properly.
4. Insert new cell with correct polarity.
5. Reseat board, close housing, ensure gasket integrity.
6. Verify LED blink at boot-up and normal operation.

4.3 Firmware Updates

Firmware is not user-updatable. Updates are deployed via the backend system through the mesh network.

5. Troubleshooting Guide

Symptom	Possible Cause	Solution
Offline / Not responding	Battery depleted	Replace battery per Section 4.2
	Outside coverage area	Move closer to anchors/gateways
	Water ingress or internal fault	Inspect, replace device if damaged
Buzzer not working	Battery too low	Check dashboard/NFC scan, replace battery
	Audio failure	Inspect and replace device
NFC not reading	Dirty surface	Clean and retry
	Antenna damage	Inspect and replace device
False fall/impact alerts	Improper mounting or vibration	Reassess mounting position
Intermittent operation	Low battery or unstable link	Replace battery, check site coverage

6. Safety & Compliance

- Ingress Protection: pending
- Compliance: pending
- Battery Safety: Use only CR2477. Do not recharge, puncture, or expose to fire.

FCC Warning Statement:

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.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this 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.

The device has been evaluated to meet general RF exposure requirement.