

# A Guide to Battery Management



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## Introduction

This user guide provides detailed information about the batteries used in Careium products, helping to ensure proper battery management procedures. It is important to remember that managing your batteries is part of a larger risk management approach. Consider the battery's age, suggested replacement timeline, location, likelihood of losing power, the length of a power outage, and the associated risk to the user. Good battery management is crucial for keeping Careium telecare systems, like alarms, sensors, and communication devices, running smoothly as they need to operate continuously for user safety and prompt assistance. This guide will provide you with tips and recommendations for monitoring and changing the batteries in your devices.

## Objectives of Document and Guidance

- Ensure uninterrupted operation of telecare peripherals through proactive battery management.
- Minimise the risk of device failure due to battery depletion.
- Establish a systematic approach to monitoring and replacing batteries.

## Peripherals Covered

- Enzo/Bogus Caller
- Ellis
- Vibby Oak Falls Detector
- Environmental detectors including i10 Smoke, Heat and CO2 alarms
- Medication Dispensers
- Temperature Extremes
- Flood Detector
- Mbox 9200
- Motion 9200
- 9350 Universal Sensor
- Mini Companion Epilepsy sensor
- PivoteLL Medication Dispenser
- CAIR Notifier Paging unit
- CAIR radio unboxed PCB transmitter

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## Automatic Low Battery (ALB) Reporting

Many telecare sensors operating on the 869MHz European Social Alarm frequency incorporate an ALB feature that automatically reports Low Battery Status to the monitoring centre (Carephones only) ALB signals are transmitted if an auto battery test detects a low battery level.

In most cases ALB tests on Careium products are performed every 11 hours if the sensor has not been activated in the period since the last test (this can differ with legacy products). The latest products test their battery every 12 hours and send an ALB message periodically if the battery has regularly been low in the previous period. The regularity of this test means that false low battery alerts caused, for example, by low temperatures will be minimised.

It is important to mention that battery chemicals can react differently in various situations especially when operating conditions or environmental conditions change and therefore it cannot always be guaranteed that ALB alarms will be sent from the devices.

Although the current Careium peripherals have ALB functionality, it is recommended that all Individual triggers are tested at least. This is due to the critical nature of the device which requires the entire alarm system to be tested. This not only tests the battery but also the whole radio receiving system and the contact through to the monitoring centre. This is in line with TSA Process Module, Installation, Planned Maintenance and Service.

Careium's digital devices also include peripheral test transmission functionality and base unit test alarm features, which we recommend incorporating into your routine. These tools can help support physical testing procedures and enhance risk management plans.

## Test Transmissions for Peripherals

In the i-care online device management portal, you can set up a specific test transmissions for your peripherals. This periodic radio test transmission will be sent by the peripheral device to the dispersed alarm. The system will monitor for this transmission every specified number of hours.

This feature is designed to provide a safeguard in case the device's battery dies before it can send a low battery warning. It is recommended where possible that these test transmissions/frames are active and managed.

Please note, this functionality will take effect only after the next manual alarm from the radio trigger is activated. Careium can support you with training and guidance on activating test transmissions or test alarms.

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## Monitoring Guidelines

### Routine Battery Checks

1. Scheduled Inspections
  - Conduct monthly check tests on telecare peripherals.
  - Use device management software that provides real-time battery status where available. (Eliza shows current voltage of battery backup and product logs show low battery alert information for the programmed peripherals).
2. Battery Status Alerts
  - Monitor battery status alerts/Automatic low battery (ALBs) on both device management portal (DMP) and monitoring platforms regularly and action battery replacements where required.
  - Don't rely on auto low battery alerts, replace batteries prior to end of life and activate test transmissions/frames on device management portal for relevant peripherals.
3. Visual Inspections
  - Perform visual inspections for signs of battery leakage or corrosion on service visits.
  - Check for swelling or discoloration in rechargeable batteries.

### Data Monitoring

1. Battery Performance Logs
  - Maintain logs of battery performance and replacement history for each device. Monitoring or field-based logistics systems are a good way of logging this information or the device management portal could be utilised for recording this information in the "Notes/Extras Field".
  - Analyse data to detect patterns or trends in battery depletion that could indicate device issues.
2. Usage Patterns
  - Monitor device usage patterns to identify any activities that significantly impact battery life.
  - Ensure regular tests are carried out from peripheral devices and remind clients of the need to test.

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## Replacement Guidelines

### Replacement Criteria

#### 1. Low Battery Alerts

- Replace or recharge batteries as soon as possible upon receiving a low battery alert.
- Ensure spare batteries are readily available for immediate replacement.



**IMPORTANT:** A low battery alert is most commonly triggered on devices that use the battery as a backup for mains power (also known as a secondary cell) when there is a disruption in the mains power supply. This disruption could be due to a power outage or a mistaken unplugging of the device. In such instances, the device automatically switches to battery power. Depending on the duration of the backup power, the device will eventually reach a low battery level. However, once the mains power is restored and the battery fully recharged, this issue will be resolved.

Please note that this does NOT mean you need to replace the battery. You can verify if the low battery alert was caused by a mains power failure by checking the logs in the device management portal.

#### 2. Battery Lifespan

- Follow manufacturer guidelines for battery lifespan and replace batteries accordingly prior to end of life.
- Replace rechargeable batteries by their expiry date if shown on the battery itself.

#### 3. Performance Degradation

- Replace any battery showing signs of performance degradation, such as rapid discharge or failure to hold a charge.

#### 4. Maximum Recommended Replacement Period

- Due to variations in battery usage specific individual performance cannot be guaranteed. Therefore, all batteries should be tested in accordance with the guidelines above and changed if any test fails. However, a maximum recommended replacement period is detailed based upon the battery in manufacturer guidelines.

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## Scheduling Replacements

### 1. Regular Replacement Schedule

- Establish a regular schedule for replacing batteries, even if they appear to be functioning well, to prevent unexpected failures. This schedule should be formulated based on the need and requirement on back-up time as the battery energy content will degrade over time. Consider the vulnerability of clients and the need for extended battery backup times and build this into the replacement schedule.
- Consider seasonal factors that may affect battery performance and life, such as temperature fluctuations.

### 2. Batch Replacements

- For systems with multiple similar devices, consider batch replacements to streamline the process and ensure consistency.

## Best Practices

### 1. Battery Types and Compatibility

- Only use manufacturer-recommended battery types to prevent compatibility issues or unexpected issues. If devices are damaged by the use of incorrect battery type this will void the product warranty.
- Consider using high-quality, long-life batteries for critical devices where battery type isn't specified. Try not to use low quality, less energy or budget batteries that have different chemical properties to that of alkaline for instance.

### 2. User Training

- Educate users and caregivers on how to test device and encourage a regular testing regime.
- Educate skilled technicians on how to check battery levels and replace batteries safely.
- Provide clear instructions and support contacts for battery-related issues.

### 3. Documentation

- Keep detailed records of battery replacements, including date, type, and any observed issues.
- Utilise device management portals and alarm receiving platform reports to monitor battery alerts.

### 4. Emergency Preparedness

- Stock spare batteries and chargers in strategic locations to ensure quick access when needed.
- Develop a plan for rapid battery replacement in case of widespread low battery alerts where large number of devices may come to end of life at similar time periods.

### 5. Refer to manufacturer guidelines/documentation

- If further battery information is needed refer to manufacturer technical data sheets or technical manuals which detail battery related information and best practices for disposal.

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## Battery Disposal and Transport

All batteries should be disposed of in accordance with current legislation. As a responsible company, Careium disposes of all returned batteries per The Waste Batteries and Accumulators Regulations.

Please see the environmental section on our website which provides further guidance on packaging, recycling, disposal and battery information. <https://www.careium.com/en-gb/eco-information/>, if using the QR code opposite please scroll to the bottom of the webpage and select the “Environmental Information” link.



## Packaging Guidelines

In order to ensure the highest quality of packaging for shipping batteries, adhere to the following guidelines:

1. Make sure to completely enclose batteries within an inner packaging to prevent any short circuits.
2. Use a strong and rigid outer packaging to offer protection against impact or crushing.
3. When shipping lithium batteries, always provide both inner and outer packaging, and also add enough cushioning material for optimal protection.
4. All packages should be securely sealed and capable of containing any potential leaks. Any damages to the packaging, such as punctures or tears, render it unfit for shipping.
5. Secure the batteries in an upright position to avoid short circuits and keep a safe distance from unnecessary heat sources during transit.
6. Lastly, cover the battery terminals with insulation tape to prevent any possibility of a short circuit.

## Labelling Guidelines

Apart from the specifications issued by governing authorities and the carrier, you must follow general labelling guidelines for all battery packages.

- The outer box must have the UN number, proper shipping name (e.g. UN 3480, Lithium-ion batteries), and hazard labels.
- Use laminated labels to prevent damage from condensation.
- Avoid placing battery shipping labels on removable packaging.



**IMPORTANT:** Packaging and labelling guidelines vary depending on how the batteries are shipped, e.g. with equipment, inside equipment, standalone, or others.

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## Conclusion

Effective battery management is essential for the reliability of telecare devices. By following these monitoring and replacement guidelines, telecare providers can improve user safety and well-being. It is important to regularly review and update battery management practices to stay aligned with new technologies and changing user needs.

## Battery types



|                             | Equipment                                    | Battery Use        | User Changeable | Rechargeable                            | Recommended replacement period (before any low battery warning) | Battery Type   |
|-----------------------------|--|--------------------|-----------------|---|---|--|
| Carephones                  | CareMobile                                   | Backup             | Yes             | Yes                                     | Up to 5 years   | 3.7V Li-Ion, 1500 mAh                                      |
|                             | CareIP Mobile                                | Backup             | Yes             | Yes                                     | Up to 5 years   | 4.8V NiMH, 2100 mAh  |
|                             | Eliza  | Backup             | Yes             | Yes                                     | Up to 5 years   | 3.7V Li-Ion, 2000 mAh                                      |
|                             | Eliza S                                      | Backup             | Yes             | Yes                                     | Up to 5 years   | 3.7V Li-Ion, 2000 mAh                                      |
|                             | Eliza S +                                    | Backup             | Yes             | Yes                                     | Up to 5 years   | 3.7V Li-Ion, 2000 mAh                                      |
|                             | Careium 450                                  | Control Unit       | No              | Yes                                     | Up to 4 years (battery non replaceable)                         | 3.7V Li-Ion, 800 mAh                                       |
|                             | Careium 460                                  | Control Unit       | No              | Yes                                     | Up to 4 years (battery non replaceable)                         | 3.7V Li-Ion, 500mAh  |
|                             | Abby   | Control Unit       | No              | Yes                                     | Up to 4 years (battery non replaceable)                         | 3.7V Li-Ion, 950 mAh                                       |
|                             | Amy  | Control Unit       | No              | Yes                                     | Up to 4 years (battery non replaceable)                         | 3.7V Li-Ion, 595 mAh                                       |
|                             | CAIR Notifier                                | Control Unit       | Yes             | Yes                                     | Up to 2 years (depending on usage)                              | 3.7V Li-Ion, 700mAh  |
| Radio devices               | Enzo   | Radio              | Yes             | No                                      | Up to 3 years   | Varta 3V Lithium CR2032                                    |
|                             | Ellis  | Radio              | Yes             | No                                      | Up to 3 years   | Varta 3V Lithium CR2032                                    |
|                             | Vibby Oak                                    | Radio              | Yes             | No                                      | Up to 24 months*  | Panasonic 3V Lithium CR2477                                |
|                             | Mbox 9200                                    | Radio              | Yes             | No                                      | Up to 24 months   | High Quality 2 x 1.5V LR6 AA Alkaline battery              |
|                             | Motion 9200                                  | Radio              | Yes             | No                                      | Up to 6 months  | High Quality 2 x 1.5V LR6 AA Alkaline battery              |
|                             | I10 Smoke                                    | Detector and Radio | No              | No                                      | Up to 10 years (battery non replaceable)                        | 3V CR123A Ultrafire Lithium battery                        |
|                             | I10 Heat                                     | Detector and Radio | No              | No                                      | Up to 10 years (battery non replaceable)                        | 3V CR123A Ultrafire Lithium battery                        |
|                             | I10 CO                                       | Detector and Radio | No              | No                                      | Up to 10 years (battery non replaceable)                        | 3V CR123A Ultrafire Lithium battery                        |
|                             | Legacy Doro 869 Smoke                        | Detector and Radio | Yes             | No                                      | Up to 2 years for Alkaline/up to 5 years for Lithium            | 9V PP3 High quality Alkaline or Lithium 6LR61/6LF22/MN1604 |
|                             |  | Detector           | Yes             | No                                      | Up to 10 years for heat unit                                    | Non replaceable Lithium battery                            |
|                             | Legacy Doro 869 Heat                         | Radio              | No              | No                                      | Up to 3 years for radio board                                   | Varta 3V Lithium battery CR2032                            |
|                             |  | Detector           | Yes             | No                                      | Up to 10 years for heat unit                                    | Non replaceable Lithium battery                            |
|                             | Legacy Doro 869 CO                           | Radio              | No              | No                                      | Up to 3 years for radio board                                   | Varta 3V Lithium battery CR2032                            |
|                             |  | Detector           | Yes             | No                                      | Up to 3 years for radio board                                   | Varta 3V Lithium battery CR2032                            |
|                             | Epilepsy Sensor (Alert IT Mini Connect)      | Control Unit       | Yes             | Control unit - Yes                      | Up to 5 years   | 2x AA Ni-MH rechargeable 2500mAh                           |
|                             |  | Radio              | No              | Radio Card                              | Up to 3 years   | Varta 3V Lithium battery CR2032                            |
|                             | Epilepsy Sensor (Alert IT Companion)         | Transmitter        | Yes             | Connect - No                            | Up to 12 months   | High quality 2 x AAA non rechargeable 1.5v LR03            |
|                             |  | Control Unit       | Yes             | Control unit - Yes                      | Up to 5 years   | 8.4v rechargeable PP3 200mAh                               |
|                             | Medication Dispenser (Pivotell)              | Radio              | No              | Radio Card                              | Up to 3 years   | Varta 3V Lithium battery CR2032                            |
|                             |  | Dispenser          | Yes             | Control unit - Yes                      | Up to 12 months   | High Quality 4 x 1.5V LR6 AA Alkaline battery              |
|                             | 9350 Flood Detector                          | Radio              | Yes             | Radio Card                              | Up to 3 years   | Varta 3V Lithium battery CR2032                            |
|                             |  | Radio              | Yes             | No                                      | Up to 3 years   | Varta 3V Lithium CR2032                                    |
|                             | 9350 Temperature Extremes                    | Radio              | Yes             | No                                      | Up to 3 years   | Varta 3V Lithium CR2032                                    |
|                             |  | Radio              | Yes             | No                                      | Up to 3 years   | Varta 3V Lithium CR2032                                    |
|                             | Bogus Caller (Enzo)                          | Radio              | Yes             | No                                      | Up to 5 years   | Varta 3V Lithium CR2032                                    |
|                             |  | Radio              | Yes             | No                                      | Up to 5 years   | Varta 3V Lithium CR2032                                    |
|                             | 9350 universal transmitter boxed and unboxed | Radio              | Unboxed - No    | No                                      | Up to 3 years (battery non replaceable)                         | Varta 3V Lithium CR2032                                    |
|                             |  | Radio              | Boxed - Yes     | No                                      | Up to 3 years   | Varta 3V Lithium CR2032                                    |
| 869mhz CAIR unboxed trigger | Radio  | No                 | No              | Up to 2 years (battery non replaceable) | High Quality 3V Lithium CR2032                                  |  |

all recommended Replaces are based on usage/recharges etc.  
\*Advice changing at 18months

