



CREST ELECTRONICS

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Guardian Battery Pack Instruction Manual

CRE 55610R

Overview

Lithium Ion has become the predominant battery technology for hand held electronic applications. In recent years due to its high energy density, high voltage, good cycle life and excellent storage characteristics. This technical manual looks at the principles of Lithium-Ion technology, its main advantages and disadvantages and how to charge and discharge it efficiently and safely. This battery is designed exclusively for model train operation.

Guardian Battery Board Specifications

- Output current: 5 Amp
- Input current: 3 Amp
- Monitors each cell on the battery voltage while charging and discharging
- Very low Idle current
- Size: 0.3" X 1.7" W 2.

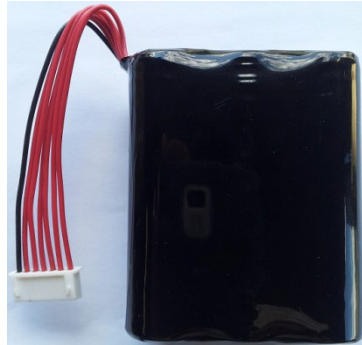


Lithium-Ion Battery Specifications

- Voltage: 21.5V (6CELLS)



- 2200mAH
- Size: 2.5" X 2.25" X 1.75"
- Weighs: 1 Pound



- NOTE: THE GUARDIAN BOARD AND LITHIUM-ION BATTERY SOLD TOGETHER AS A PACK. BOTH ITEMS MUST BE USED TOGETHER TO FOR PROPER OPERATION.

Charger CRE 55620R

- CRE 55620R charger sold separately
- Plug the Charger to a 120 Volt wall outlet; do not use power strip.
- The Green light on the charger will illuminate.
- The Red light on the charger will illuminate solidly indicating the battery is charging.
- When the battery is fully charge the GREEN light on the charger will illuminate solid.
- Charge only one (1) battery pack at the same time.
- Auto cut off when battery is fully charge.





Warnings

- Never short circuit the discharge or the charge terminals of the battery.
- Keep the battery away from excessive heat and open flames.
- Never subject the battery to intense physical shock or severe vibration or impact.
- Protect the battery from water or other moisture.
- Keep the battery away from children.
- When the battery is not in use for an extended period of time (more than 30 days), unplug the white plug with the seven wires from the Guardian Board for storage.
- Use only the special charger CRE 55620R supplied by our company.
- Never use any other charger to charge the above battery.
- Do not join these batteries in series with any other battery.
- Never charge more than one battery at a time.

1. Connect the Battery to the Guardian Board

- Connect the seven wire plug 'white' on the battery to the Guardian Board





2. Charging the Battery

- The charger has a female plug and on the Guardian board has a male plug. Insert both plugs firmly to charge the battery. The charger will indicate a Red light showing that the battery is charging.
- Charging time is 2.5Hrs to 3Hrs
- While the battery is charging the Blue light on the Guardian Board will flash.
- When the battery is fully charge the light on the charger will illuminate Green.
- On the battery Guardian Board the LED light will illuminate a solid Blue light indicating the battery is fully charged and fully balanced.
- A full charge battery will provide an average of two (2) hours of running time, depending on the type of locomotive and the length and nature of the train.

3. Installation

- It is necessary to have a way to control the locomotive while using battery operation. It is recommended that Crest, On Board Receiver 2.4 Revolution System CRE 57002SD or CRE57002SS, be utilized as the operating control. The “On Board” receiver should be installed in the locomotive, tender or trailing car.
- Note: if you do not have the Revolution System to operate your locomotive you need to purchase the complete set, CRE 57000SD or CRE57000SS.
- If the locomotive wired incorrectly for battery operation or there is a short on the battery out-put wires on the locomotive the LED on the Guardian Board will illuminate Red. Unplug the battery plug from the locomotive and wait for five seconds for the Blue LED to Flash, at this time the battery is ready to use.

4. Operation

- Connect the Guardian male ‘two pin’ plug to the female ‘two pin’ plug on the locomotive.
- Note: if the locomotive you are using does not have the female plug for battery operation you need to wire the locomotive for battery operation. We recommend using, ART 29511 plug for battery operation.
- Use the instruction manual of the Revolution Train Engineer 2.4 GHz to Link the transmitter and receiver to operate the locomotive.
- The locomotive will stop moving when the battery reaches its discharge capacity. The Guardian Board LED will Flash Red, at this time unplug the Guardian board plug from the locomotive and charge the battery.



5. Discharging

- During discharge, the voltage of a charged Li-on cell will steadily drop from an initial 4.2V once loaded. It is for this reason that a voltage sensing protection circuit is fitted to prevent over discharge of any one cell.

6. Storage

- When the battery is not in use unplug the seven wire plug from the main Guardian Board.
- The battery should be kept in storage in a clean, dry and ventilated area; it should be avoided to touch with any corrosive substance and should be away from excessive heat and open flames.
- Storage of cells between 32°F and 85°F is recommended although short periods of storage (<24Hrs) at temperatures up to +85°F will not cause any long term negative effects. Where possible, cells should be stored in an open circuit condition in a dry environment close to room temperature. Li-on cells exhibit excellent charge retention over a wide temperature range. When stored at room temperature, a fully charged cell will only loose around 5% of its original capacity in the first month and this loss will drop to around 3% for subsequent months.

7. Battery Cycle

- When charged and discharged cycles degrade the capacity of the battery.

8. LIMITED WARRANTY

- CREST ELECTRONICS products CRE 55610R Lithium-Ion Guardian Battery Pack and CRE 55620R is warranty for six (6) months from date of purchase against defects in workmanship and/or materials. **Proof of purchase may be required by Crest Electronics.**
- Breakage or damage caused by extended use, and items considered to be normal wear and tear by normal use may not be covered under this warranty, and coverage is subject to the discretion of Crest Electronics.
- This warranty is void and does not apply to any product and/or parts and components which have been improperly installed by the purchaser/owner, abused or damaged in any way through improper operation such as wrong wirings, repairs or modifications performed by non-authorized service centers or technicians.



9. SERVICING

- Should your Crest product require warranty service, please return it in the original box, if possible, protected by a proper shipping carton. Send the product fully insured and prepaid. Crest Electronics will not be responsible for any loss or damage incurred during shipping. Be sure to include a brief, but thorough explanation of the problem, together with your name, street address city state or province and country, if outside of the United States. Also include a daytime telephone number so that we may contact you if necessary. Your return address should be clearly marked on the outside of the shipping carton.
- Payment for shipping and handling, in U.S. funds, is \$10.00 and should be included. Your check or money order should be made payable to: Crest Electronics Inc. Do not send cash. If your item is not covered by warranty service, you will be contacted and a repair estimate given before any work commences. Warranty covers manufacturer defects, not normal wear and tear.

The shipping address to be used for returns:

Crest Electronics.
Customer Service Department
698 South 21st Street
Irvington, NJ 07111 USA
Tel: (973) 351-9800

- Written confirmation of receipt of returned items will be sent with estimated repair time by the Crest Electronics Customer Service Department.



Revolution Set
CRE 57002SD or CRE57002SS