

LUMOS BATTERY PACK DISASSEMBLY INSTRUCTIONS

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Battery pack details

Name: Lumos Secured Li-ion Battery

Manufacturer part number: ICR18650-26J-4S11P

Ratings: 14.4 V, 23000 mAh, 331 Wh

Audience

The disassembly manual for the Lumos is for technicians with a basic knowledge in electrical circuit design for storage systems, safe use of electrician tools and measuring instruments and safety precautions associated with lithium ion batteries

Objective

The aim of this manual is to give clear instructions on how to disassemble the Lumos Battery pack in a safe and effective way.

Tools and materials needed for the job

- Insulated (ceramic) long nose pliers
- wire cutters
- Philips-head screwdriver
- insulating tape.

Safety precautions

- Wear gloves and safety glasses.
- Avoid leaving metal scraps on the table.

- Do not remove the pink wrapper. If you do, make sure you cover the scrape with an electrical insulating tape.
- Trim any sharp point that would puncture the cell.
- Know the difference between the cell terminals: the positive terminal has a white ring and is dented, while the negative terminal is flat and has no distinctive feature.
- Never short-circuit the positive and negative terminals of the cell or battery pack.



Figure 1: 18650 Cell polarity

- Never connect strips that electrically separated. The Lumos battery pack has 5 such strip bus, indicated in Figure by arrow

Here they are indicated otherwise linked such as

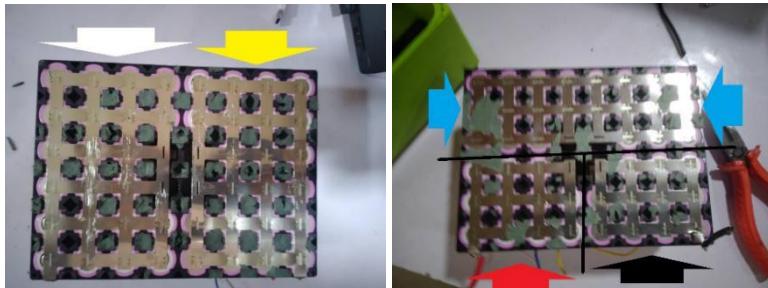


Figure 2: metal strips connecting the cells

Procedures

The dismantling of the battery pack is done in 3 main stages, each counting 4 to 7 steps.

Stage 1: Open the box

- 1.1. Put the box on a clean, dry, and flat non-conducting surface, the upperside (with wires coming out of the box) up.
- 1.2. Loosen and remove the 4 screws on the 4 corners of the top cover with the screwdriver by turning counterclockwise
- 1.3. Slightly open the box to reveal the battery blocks and BMS circuit board.
- 1.4. Lay aside the cover housing the circuit board of the battery management system (BMS) and monitoring unit.



Figure 3: Lumos Battery pack



Figure 4: Slightly open the cover

Stage 2: Separate the BMS from the battery block

The BMS is connected to the battery block via 5 wires, blue, white, yellow and 2 blacks. 2 other wires (red and black of a larger size) connect directly the battery block to the outside circuitry via a fuse.

- 2.1. Separately cut each of the 7 wires with the wire cutter or pliers to release the cover and BMS circuit board from the box.
- 2.2. Slightly take the battery block out of the box and set the container box aside

- 2.3. Remove the black shock absorber foams all around the box, namely the top, bottom, and the 4 lateral sides.
- 2.4. Remove the 7 wires soldered on each of the metal strip bus namely negative, positive, and intermediary bus from the top side, and 2 other intermediary bus on the bottom side.

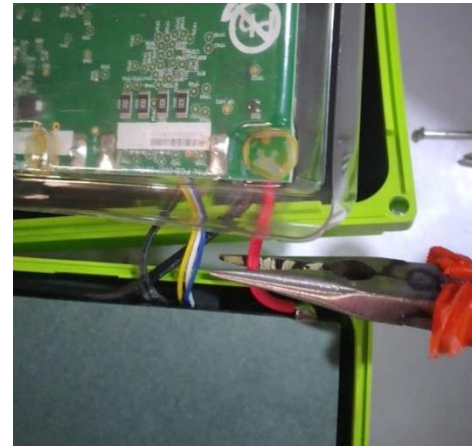


Figure 5: Cutting off the wire



Figure 6: Top view of opened box with cut wires



Figure 7: Removing the insulation and shock absorber foam



Figure 8: Battery module out of the container

Stage 3: Disconnect the cells

- 3.1. On the top side, there are three blocks of metal strips connecting groups of cells in a series-parallel fashion. Do not connect these strips as it would short-circuit blocks of cells.
- 3.2. With insulated long-nose pliers, remove the metal strip of the positive bus.
- 3.3. Repeat the process for the metal strip of the negative bus.
- 3.4. Repeat the process for the long metal strip of the intermediary bus.
- 3.5. On the bottom side, there are 2 long metal strips for other intermediary buses.
- 3.6. With long nose pliers, remove these metal strip buses too.

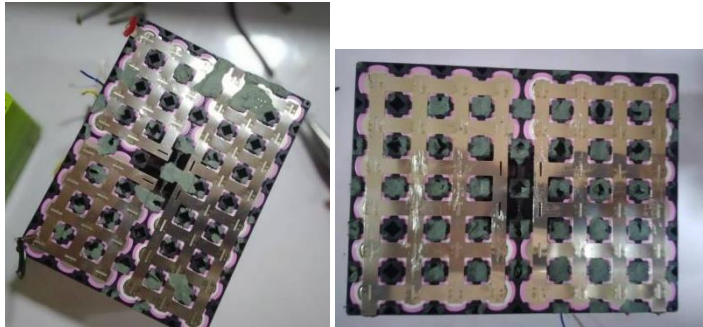


Figure 10: Top (left, 3 strip blocks) and bottom side(right, 2 strip blocks) connecting strips



Figure 9: Stripping the connecting strip off with pliers which nose is tape-insulated

Stage 4: Inspect and store the cells

- 4.1. Remove the upper black plastic portion of the cell holder, to store the cells.
- 4.2. Remove each individual cell from the remaining lower black cell holder, inspecting for any scrapes or other signs of damage.
- 4.3. Label the cell using the convention -PACK-POSITION-convention (e.g.: +LM-0001-01 +LM-0001-02, +LM-0001-03, -LM-0003-01, -LM-0003-02, -LM-0003-03) and store safely in a battery holder.
- 4.4. Enrol the cells in the inventory system, adding any observations you may have from the visual inspection.



Figure 11: Dismantled cells stored in a battery holder