

# 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

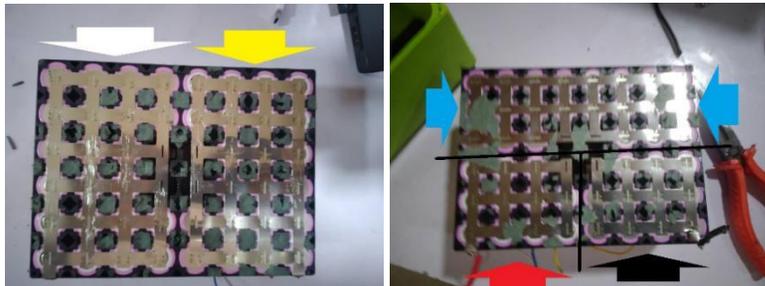


Figure 2: metal strips connecting the cells

## 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.

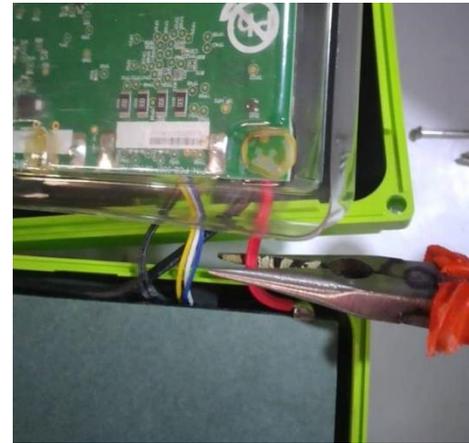


Figure 5: Cutting off the wire



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.

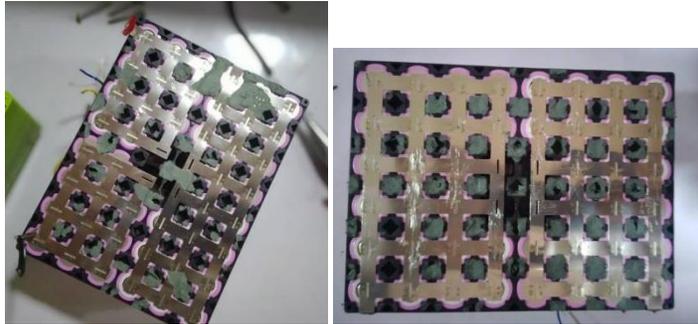


Figure 10: Top (left, 3 strip blocks) and bottom side(right, 2 strip blocks) connecting strips



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