



Recovery Procedure CAN Batteries

MAN0037.23

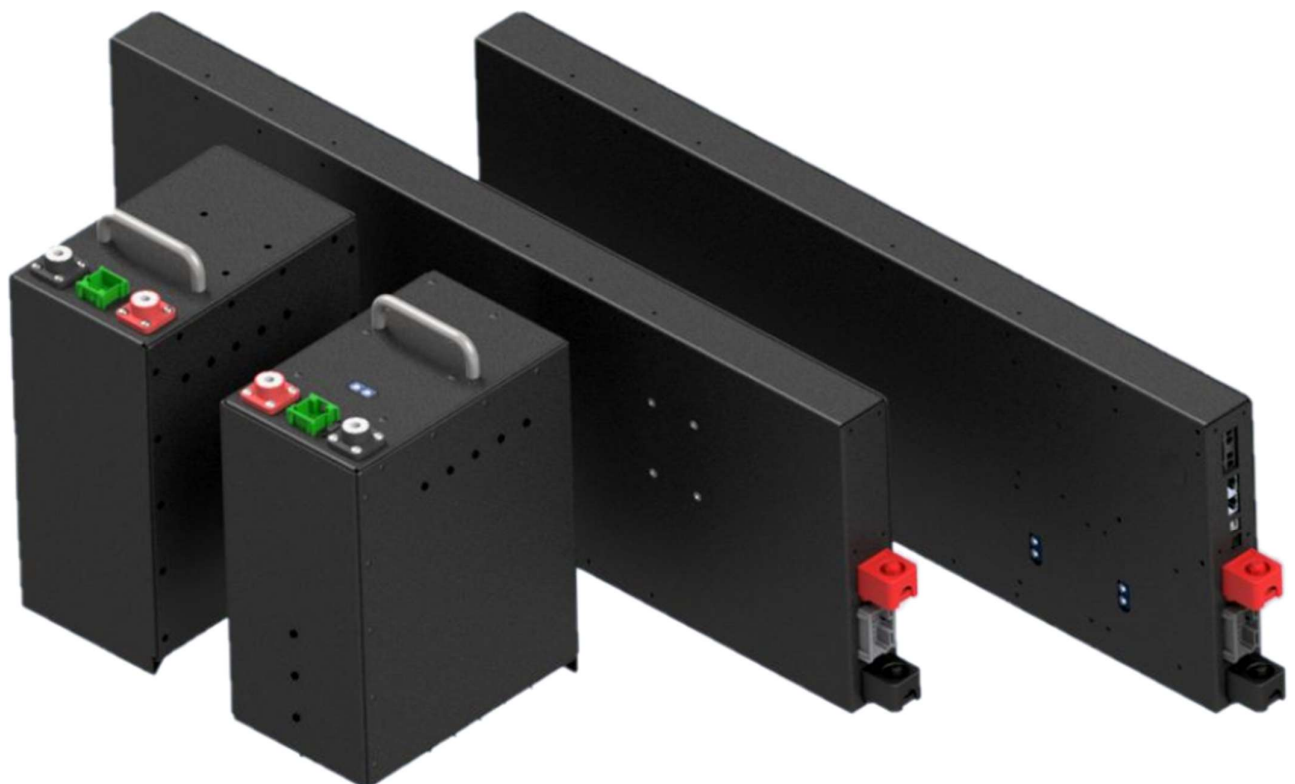


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1. Safety Precautions

WARNING

- ❑ This procedure should only be carried out by a licensed and qualified auto electrical professional. Any faults, damage, or failures resulting from attempts to undertake this procedure by qualified or unqualified persons will void all warranties.
- ❑ Following this procedure means that you are working on the battery with overly discharged cells.
- ❑ Not every battery can be recovered.
- ❑ The best practice is to send the battery back to the manufacturer. The manufacturer will not cover the shipping cost.
- ❑ Do not expose the battery to water.
- ❑ Do not expose the battery to fire.
- ❑ Do not pierce the battery.
- ❑ Do not disassemble.
- ❑ Do not drill into the battery enclosure.
- ❑ Do not short battery terminals.
- ❑ Do not connect multiple batteries in a series configuration.
- ❑ Do not charge the battery outside the range of 0°C - 45°C.
- ❑ Do not store below -20°C or above 60°C.
- ❑ Risk of burns if misused.
- ❑ Always follow safe working practices.

2. Technical Context

This document describes the recovery procedure for batteries with an in-built Battery Management System (further – BMS). In-built BMS controls charging/discharging, protects the cells, and decides when it is safe to charge a discharged battery.

The built-in BMS enters protection mode as soon as the battery voltage drops below 10.5V. This should not happen under normal circumstances. Timely charging is a crucial part of battery maintenance that helps ensure the battery's long lifespan. However, the battery can be recovered without dramatic consequences at this point. Try to charge the battery as you would under normal conditions.

If the battery remains discharged for an extended period, the BMS may decide it's unsafe to charge the battery. As a result, you won't be able to recharge your battery. This means that your battery is out of order and out of warranty. In this case, the only way to charge your battery is by bypassing the BMS.

Please be aware that you can only recover batteries equipped with an MCP-connector and high-current terminals. Batteries with Anderson connectors and a banana plug cannot be recovered. The product must be returned to Cangoee at the end user's expense. Following inspection, if the fault is determined not to be covered under warranty, a quotation for the required work will be provided.



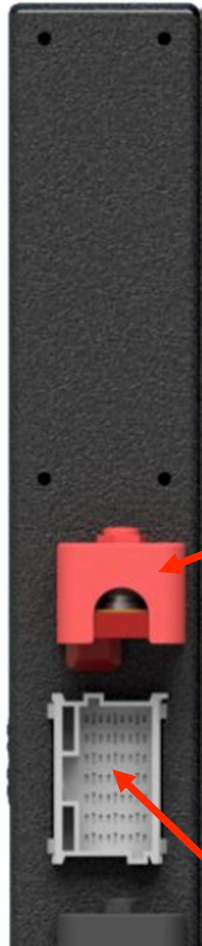
Figure 2 Batteries That Can Be Recovered



Figure 1 Batteries That Cannot Be Recovered

Please be aware that BMS is an in-built safety device, and you must exercise extreme caution when bypassing it. You need to monitor the battery for any deformation during the process. In case of doubt, stop the process immediately.

3. Slimline Battery Interface



12V POSITIVE OUT (Threaded Connection)
Cell #4 is directly connected to the positive terminal. To measure voltage or charge the cell, connect to CELL3+ (which will be negative for cell #4) and the positive terminal (which will be the positive output for cell #4).

21 WAY MULTI-CONTACT POINT (MCP) CONNECTOR
The MCP Connector is your access point to the internal features of the battery. Connection to the individual Lithium Cells can be used for measuring voltage and charging purposes. The positive output of the cell #4 is connected directly to the 12V positive terminal, and doesn't have a dedicated pin in the MCP connector.

MCP PINOUT

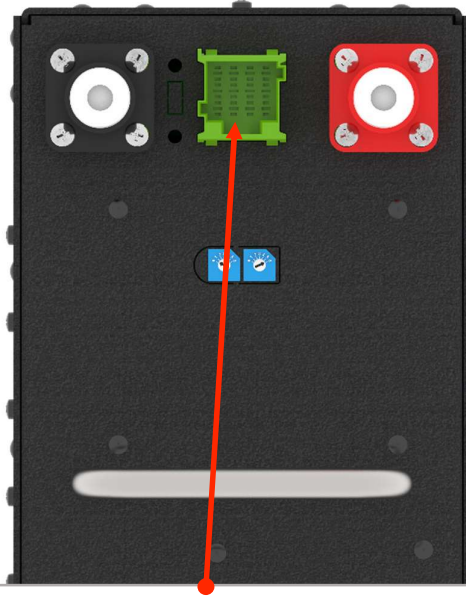
PIN 14	CELL1-
PIN 15	CELL1+
PIN 16	CELL2+
PIN 17	CELL3+

Male Connector Pin Layout (Wire Entry Side)

Table 1 MCP Pinout with Male Connector Pin Layout

Figure 3 Slimline Connection Description

4. Rectangular Battery Interface

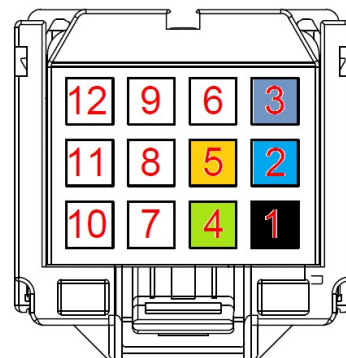


12 WAY MULTI-CONTACT POINT (MCP) CONNECTOR

The MCP Connector is your access point to the internal features of the battery. Connection to the individual Lithium Cells can be used for measuring voltage and charging purposes. You can access all cells inside of the battery through the MCP Connector.

MCP PINOUT:

PIN 01:	CELL1-
PIN 02:	CELL1+
PIN 03:	CELL2+
PIN 04:	CELL3+
PIN 05:	CELL4+



Male Connector Pin Layout
(Wire Entry Side)

Table 2 MCP Pinout with Male Connector Pin Layout

Figure 4 Rectangular Connection Description

5. Recovery Procedure

Most DC chargers do not allow precise control of the output current. Please use a power supply that provides current control within the required accuracy (0.5A, 10.5V).

The recovery wiring looms (WIR10506.1/WIR10506.2) are equipped with a 1A blade fuse. Do not replace this fuse with one of a larger capacity.

Please use the following algorithm:

1. Disconnect your battery entirely from the existing system.



Figure 5 Rectangular Battery



Figure 6 Slimline Battery

2. Insert the MCP connector of the recovery wiring loom WIR10506.1/WIR10506.2 into the battery.

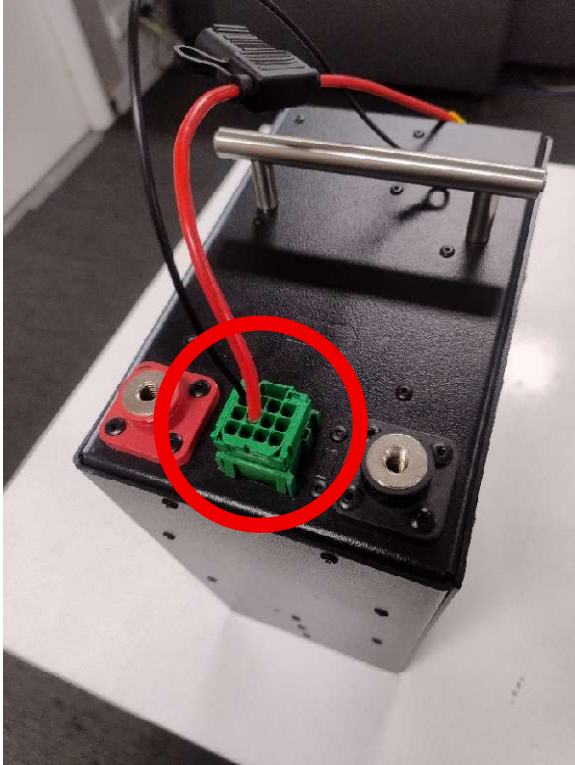


Figure 7 12-pin MCP Connector



Figure 8 21-pin MCP Connector

3. Connect the fused wire to the high-current output terminal (WIR10506.1).



Figure 9 Fused Wire Connection (21-pin MCP)

- Alternatively, you can use crocodile clips. Please exercise extreme caution and do not short-circuit the pin you are working with and the nearby pins.



Figure 10 Negative Input

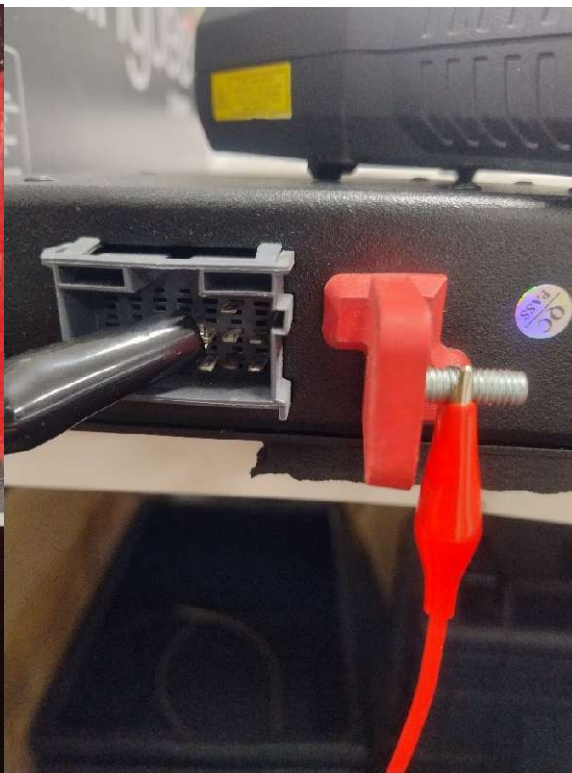


Figure 11 Overall Setup

- Adjust the output current and voltage on your DC power supply (0.5A, 10.5V).



Figure 12 0.5A Limit



Figure 13 10.5V Limit

6. Connect your DC power supply to the battery and charge cells at a 0.5A current until the cell pack voltage reaches 10.5V.
7. After the cell pack reaches 10.5V, check if you have voltage across the high-current output terminals. If there is no voltage, disconnect your power supply from the battery, increase the voltage to 12.0V and apply it to the high current output terminals. If it wakes the battery up, you can charge your battery as usual.

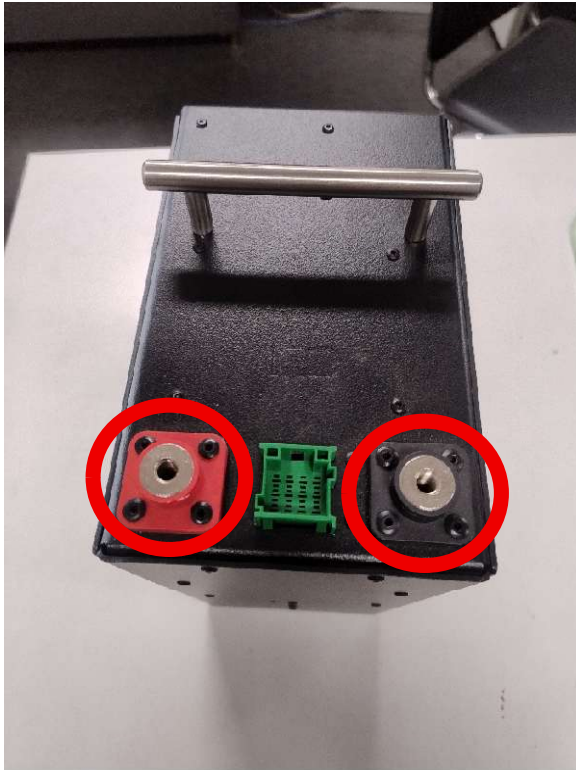


Figure 14 High-Current Output Terminals



Figure 15 High-Current Output Terminals

8. If applying 12.0V to the output terminals didn't wake the battery up, continue to charge cells with the current settings (0.5A, 12.0V) until the cell pack voltage reaches 12.0V. Check for voltage across the high-current terminal. If there is no voltage, disconnect your power supply from the battery and apply 12.0V to the high-current output terminals. If it wakes the battery up, you can charge your battery as usual.
9. If the cell pack has a voltage of 12.0V, and applying 12.0V to the output terminal does not make any difference, please get in touch with Cangoee Tech Support Team.