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## UMLIFE UMLIFE-001

# UMLIFE 8PCS 2A 5V Charge Discharge Integrated Module User Manual

Model: UMLIFE-001 | Brand: UMLIFE

## 1. Introduction

This manual provides detailed instructions for the UMLIFE 8PCS 2A 5V Charge Discharge Integrated Module. This versatile module combines charging, discharging, lithium battery protection, and battery level indication functionalities, making it ideal for various portable power applications. Please read this manual thoroughly before use to ensure proper operation and safety.

## 2. Product Overview

The UMLIFE Charge Discharge Module is a compact PCB designed for 3.7V/4.2V 18650 lithium batteries. It features multiple connection points for input, battery, and output, along with a control key and battery status LEDs.

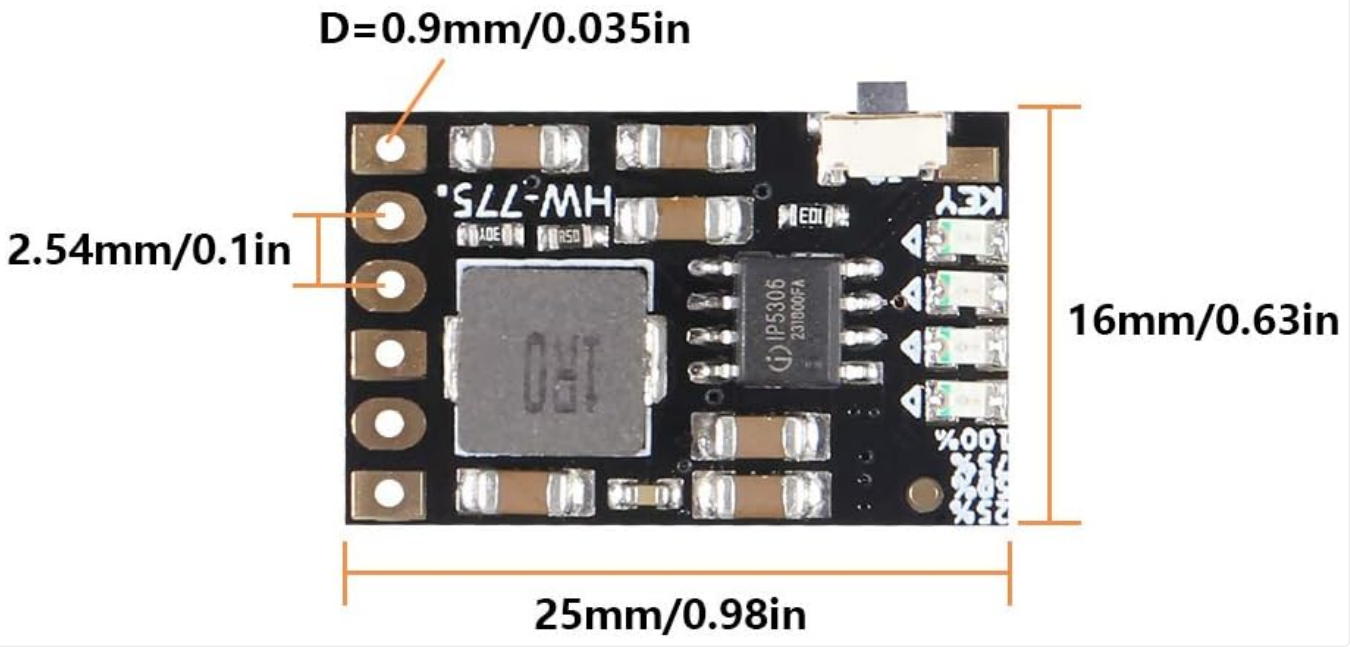



**Figure 1: Module Dimensions.** This image displays the compact size of the UMLIFE Charge Discharge Module, measuring approximately 25mm (0.98in) in length, 16mm (0.63in) in width, and featuring standard 2.54mm (0.1in) pin spacing with 0.9mm (0.035in) diameter holes for easy integration.

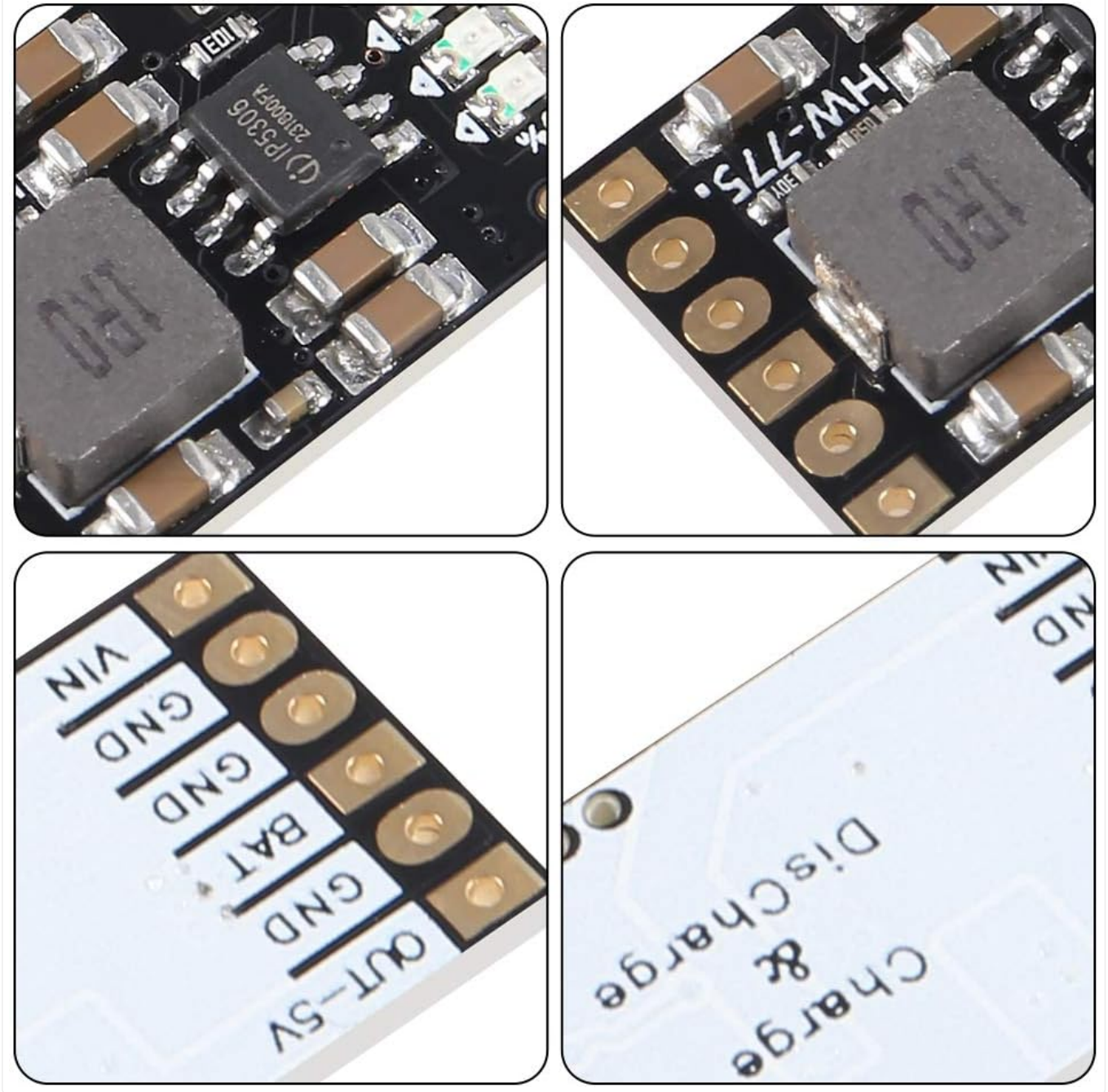



**Figure 2: Module Components and Ports.** A detailed view showing the key components including the inductor, integrated circuits, and clearly labeled connection pads: VIN (Voltage Input), GND (Ground), BAT (Battery), OUT-5V (5V Output), and the KEY button for control.

### Key Features:

- **4-in-1 Functionality:** Integrated charging, discharging, lithium battery protection, and battery level indication.
- **Battery Protection:** Includes over-current, over-voltage, over-temperature, and short-circuit protection.
- **High Efficiency:** Discharge efficiency up to 96%.
- **Automatic Output Control:** Intelligent load detection for automatic output activation/deactivation.
- **MCU Compatibility:** KEY port can be triggered by microcontrollers for continuous operation under small loads.

## 3. Specifications

| Feature | Description |
| --- | --- |
| Model Number | UMLIFE-001 |

| Feature | Description |
|---|---|
| Input Voltage (Charging) | 4.5V - 5V DC (2A-3A recommended) |
| Output Voltage (Discharging) | 5V |
| Compatible Battery | 3.7V / 4.2V 18650 Lithium Battery |
| Discharge Efficiency | Up to 96% |
| Protection Functions | Over-current, Over-voltage, Over-temperature, Short-circuit |
| Dimensions (L x W x H) | 25mm x 16mm x 4mm (approx. 0.98" x 0.63" x 0.16") |
| Weight | 20g (approx.) |
| Hardware Interface | USB (implied for 5V output/input) |

## 4. Setup and Connections

Proper connection is crucial for the safe and effective operation of the module. Refer to the wiring diagram below for guidance.

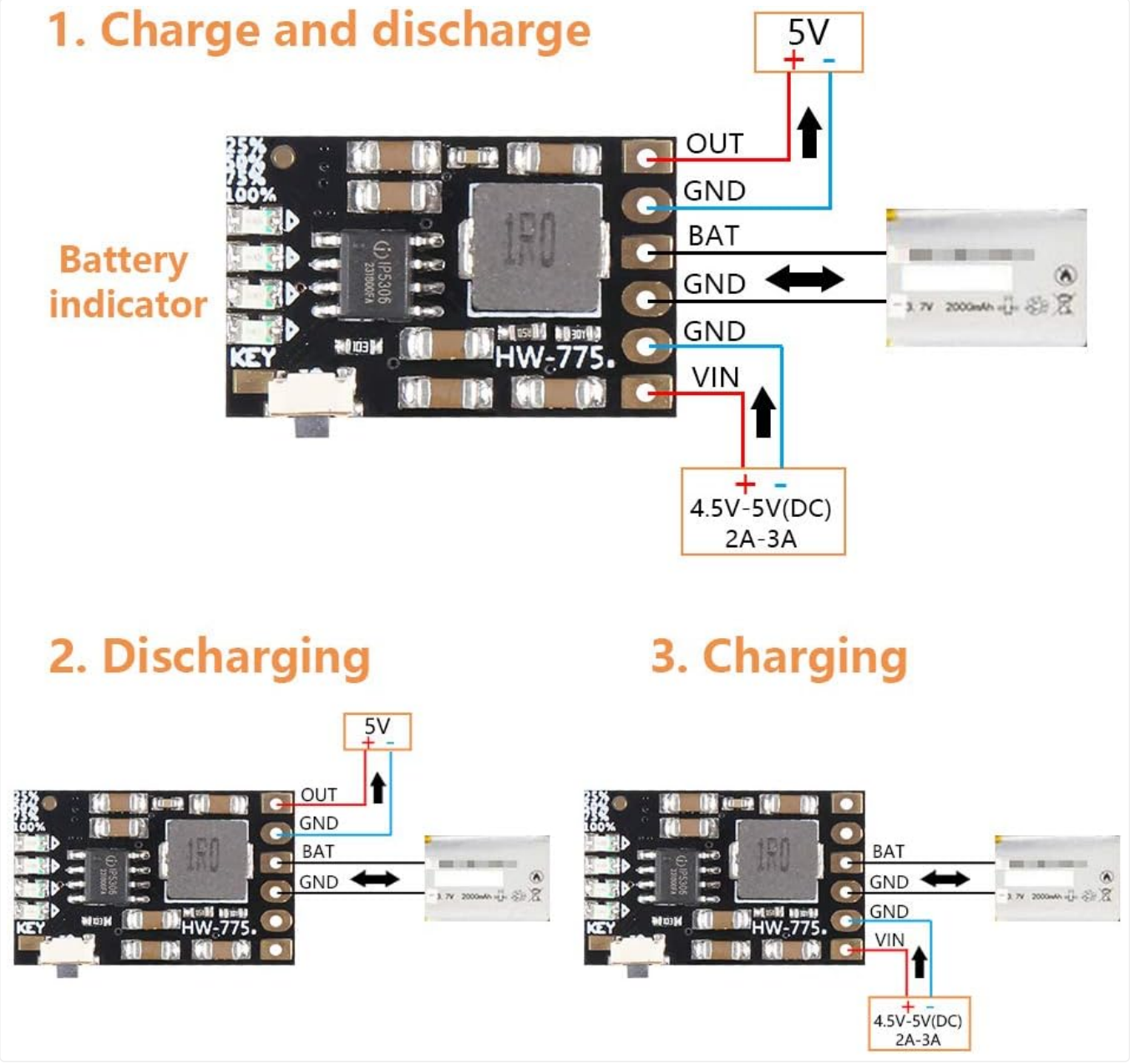


**Figure 3: Connection Diagram.** This diagram illustrates the wiring for combined charge and discharge, discharge only, and charge only modes. It shows connections for input power (VIN, GND), battery (BAT, GND), and 5V output (OUT, GND), along with the battery indicator LEDs.

### Connection Steps:

1. **Connect the Battery:** Connect the positive terminal of your 3.7V/4.2V lithium battery to the **BAT** pad and the negative terminal to one of the **GND** pads. Ensure correct polarity to prevent damage.
2. **Connect Input Power (for Charging):** For charging the battery, connect a 4.5V-5V DC power source (2A-3A recommended) to the **VIN** pad (positive) and a **GND** pad (negative). A micro-USB port is also available for input.
3. **Connect Output Load (for Discharging):** To power external devices, connect the positive terminal of your load to the **OUT-5V** pad and the negative terminal to a **GND** pad. The module will provide a stable 5V output.
4. **KEY Pin Connection (Optional for MCU Users):** If using a microcontroller (MCU) to maintain output under small loads, connect the KEY pin to the MCU. Providing a low-level signal (ground) for approximately 20 seconds will keep the module active.

***Important:*** *Always double-check all connections for correct polarity and secure contact before applying power. Incorrect wiring can damage the module or connected devices.*

## 5. Operating Instructions

### 5.1. Output Control (Discharge Mode)

- **Activate Output:** Trigger the **KEY** port once (momentary press or low-level signal) to enable the 5V output.
- **Deactivate Output:** Continuously trigger the **KEY** port twice (two quick presses or low-level signals) to disable the 5V output.
- *Note: The KEY function is inactive during charging mode.*

### 5.2. Automatic Output Behavior

- When a load is first connected, the output will automatically activate.
- If the connected load draws less than 50mA, the module will automatically close the output after 30 seconds to conserve power.
- If the connected load draws more than 50mA, the output will remain open automatically.

### 5.3. Battery Level Indicator

The module features LED indicators to display the current charge level of the connected lithium battery. Refer to the module's markings for specific percentage indications (e.g., 25%, 50%, 75%, 100%).

## 6. Applications

This versatile module can be integrated into a wide range of projects and devices:

- Solar panel to mobile phone charging solutions.
- Automotive charging retrofits (e.g., USB ports in cars).
- Power supply for driving recorders and other vehicle accessories.
- DIY mobile power banks (power treasures).
- Household power supply projects and intelligent plugging transformations.
- Fast charging adapter integration for various portable devices.




**Figure 4: Example Applications.** This image illustrates various practical uses for the module, including powering driving recorders, enabling car charging retrofits, creating mobile power banks, and charging portable devices like smartphones and tablets.

## 7. Maintenance

The UMLIFE Charge Discharge Module is designed for durability and requires minimal maintenance. To ensure its longevity and optimal performance:

- Keep the module dry and away from moisture or liquids.
- Avoid exposing the module to extreme temperatures (very hot or very cold).
- Handle with care to prevent physical damage to the PCB or components.
- Ensure proper ventilation when in operation, especially under heavy loads, to prevent overheating.
- Periodically check connections for looseness or corrosion.

## 8. Troubleshooting

If you encounter issues with your module, consider the following troubleshooting steps:

| Problem | Possible Cause / Solution |
| --- | --- |
| No 5V output | ◦ Check battery connection and ensure it is charged.<br>◦ Verify load is connected correctly to OUT-5V and GND.<br>◦ Ensure the output is activated (trigger KEY once).<br>◦ If load is < 50mA, output may have automatically turned off after 30s. Re-activate.<br>◦ Check for short circuits on the output. |
| Battery not charging | ◦ Verify input power (4.5V-5V DC) is connected to VIN and GND.<br>◦ Ensure input power source can supply sufficient current (2A-3A recommended).<br>◦ Check battery connection and polarity.<br>◦ Battery may already be fully charged. |
| Module overheating | ◦ Ensure the load current does not exceed the module's capabilities.<br>◦ Provide adequate ventilation around the module.<br>◦ Check for short circuits in the load or wiring. |
| Battery indicator LEDs not working | ◦ Check battery connection.<br>◦ Battery may be completely discharged or not connected. |

## 9. Safety Information

Please observe the following safety precautions to prevent injury or damage to the module and connected devices:

- **Electrical Safety:** Always disconnect power before making or changing connections. Do not touch exposed wires or components when power is applied.
- **Polarity:** Pay close attention to polarity when connecting batteries and power sources. Incorrect polarity can cause severe damage.
- **Battery Handling:** Use only compatible lithium batteries (3.7V/4.2V 18650). Do not short-circuit batteries. Do not expose batteries to extreme heat or puncture them.
- **Load Limits:** Do not exceed the specified current and voltage ratings for the input and output. Overloading can damage the module and connected devices.
- **Environment:** Operate the module in a dry, well-ventilated area. Avoid environments with high humidity, dust, or corrosive substances.
- **Professional Installation:** If you are unsure about any aspect of installation or wiring, seek assistance from a qualified professional.
- **Children:** Keep the module and its components out of reach of children.

## 10. Warranty and Support

For warranty information and technical support, please refer to the documentation provided with your purchase or contact the seller directly. Keep your purchase receipt as proof of purchase.
For further assistance, you may visit the UMLIFE Store on Amazon.

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