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Aideepen X-HX0598A

Aideepen 18650 Battery Capacity Tester Module

User Instruction Manual for Model X-HX0598A

1. Product Overview

The Aideepen 18650 Battery Capacity Tester Module (Model X-HX0598A) is a compact and efficient device designed for accurately measuring the capacity and internal resistance of 18650 lithium batteries. It features a Type-C power input, a clear display, and user-friendly controls, making it ideal for hobbyists and professionals alike. This module supports adjustable test cycles and provides comprehensive data for battery analysis.



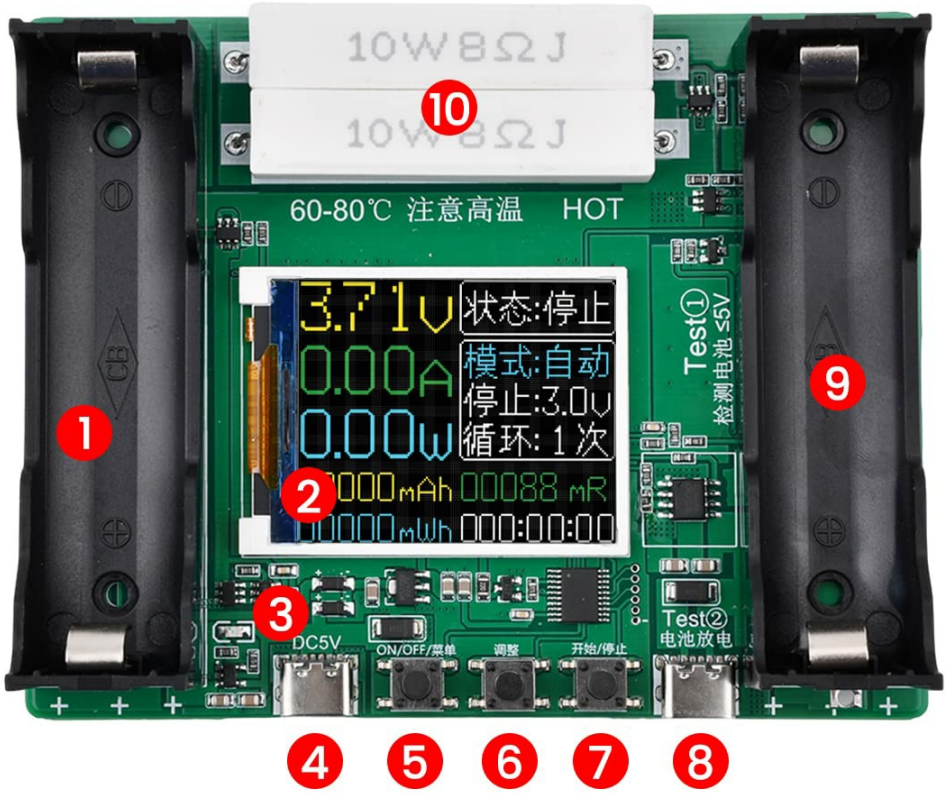
Figure 1: Angled view of the Aideepen 18650 Battery Capacity Tester Module.



Figure 2: Top-down view of the Aideepen 18650 Battery Capacity Tester Module.

2. Components and Interface

Familiarize yourself with the various components and the display interface of the battery tester for optimal operation.



① 動作するバッテリーコンパートメント（0.5Aまでの充電に対応するようにハードウェアが制御されており、充電容量の測定はできない）

② 1.77型ディスプレイ

③ バッテリーコンパートメントの充電インジケーターが動作する（充電中は点灯、満充電時は無点灯）

④ Type-C 5V電源コネクタ　⑤ ON/OFF/Laylist」ボタン　⑥ ""調整 ""ボタン

⑦ ""Start/Stop ""ボタン　⑧ テスト2：Type-C外部放電コネクタ

⑨ テスト1：18650バッテリーコンパートメントの充放電（ソフトウェア制御による約1Aまでの充放電）

ステップ8と9は同時にはテストできません"

Figure 3: Labeled components of the battery capacity tester.

1. **Working Battery Compartment:** This slot is hardware-controlled for a 0.5A discharge. Note that capacity cannot be measured in this compartment.
2. **1.77-inch Display:** Provides real-time data and status information.
3. **Battery Compartment Charging Indicator:** Illuminates during charging and turns off when the battery is fully charged.
4. **Type-C Power Connector:** Used to supply power to the module.
5. **ON/OFF/Laylist Button:** Controls power and navigates menus.
6. **"Adjust" Button:** Used for adjusting settings and values.
7. **"Start/Stop" Button:** Initiates or terminates testing procedures.
8. **Test 2: Type-C External Discharge Connector:** For external discharge testing.
9. **Test 1: 18650 Battery Compartment:** For charge/discharge testing, software-controlled at approximately 1A.
10. **10W 8Ω J Resistors:** Heat dissipation components.

The module features a clear display that provides various real-time measurements and status indicators:



Figure 4: Detailed view of the display interface and its indicators.

1. **Real-time Voltage (V)**
2. **Real-time Current (A)**
3. **Real-time Power (W)**
4. **Accumulated Capacity (mAh)**
5. **Accumulated Energy (mWh)**
6. **Accumulated Run Time (hh:mm:ss)**
7. **Internal Resistance (mR)**
8. **Operation Mode Menu**
9. **Discharge Stop Voltage Menu**
10. **Cycle Time Menu**
11. **Status Display**

3. Setup and Power Supply

To begin using the Aideepen Battery Capacity Tester Module, follow these setup instructions:

- **Power Source:** The module requires a DC5V external power supply. You can use a standard Type-C power adapter (such as a mobile phone charger) and a Type-C cable. Please note that the power cable is not supplied with the module and must be provided by the user.
- **Alternative Power:** The module can also be powered by an 18650 battery inserted into the designated power supply battery slot.
- **Connecting Power:** Connect the Type-C power cable to the Type-C power connector on the module.
- **Initial Power On:** Once power is connected, the display should illuminate, indicating the module is ready for operation.

4. Operating Instructions

4.1. Battery Compatibility

This tester is designed for 18650 lithium batteries that meet specific criteria:

- The battery should be charged to 4.2V.
- The battery's discharge stop voltage should be between 2.5V and 3.5V.

4.2. Testing Procedure

To perform a battery capacity test:

1. Ensure the module is powered on.
2. Insert the 18650 battery to be tested into the **Test 1: 18650 Battery Compartment** (the right slot, as indicated in Figure 3). Ensure correct polarity.
3. Use the **"Adjust" Button** (6) to navigate through the display menus and set desired parameters, such as discharge stop voltage (from 2.5V to 3.5V, adjustable in 11 steps) or operation mode.
4. Press the **"Start/Stop" Button** (7) to begin the test. The module will start discharging the battery and measuring its capacity.
5. Monitor the real-time voltage, current, power, accumulated capacity, accumulated energy, and run time on the display.
6. The test will automatically stop when the battery reaches the set discharge stop voltage. The final accumulated capacity (mAh) and energy (mWh) will be displayed.

4.3. Cycle Testing

The module supports cycle testing to evaluate battery performance over multiple charge/discharge cycles:

- Navigate to the Cycle Time Menu (8-3 on the display, Figure 4) using the "Adjust" button.
- Adjust the number of cycles from 1 to 9 as required.
- Start the test using the "Start/Stop" button. The module will automatically perform the set number of charge and discharge cycles, providing data for each cycle.

5. Internal Resistance Measurement

The module can measure the internal resistance of batteries using a DC two-wire method. This method is generally accurate when the battery is fully charged. For higher precision requirements, a dedicated 4-wire AC internal resistance meter is recommended.

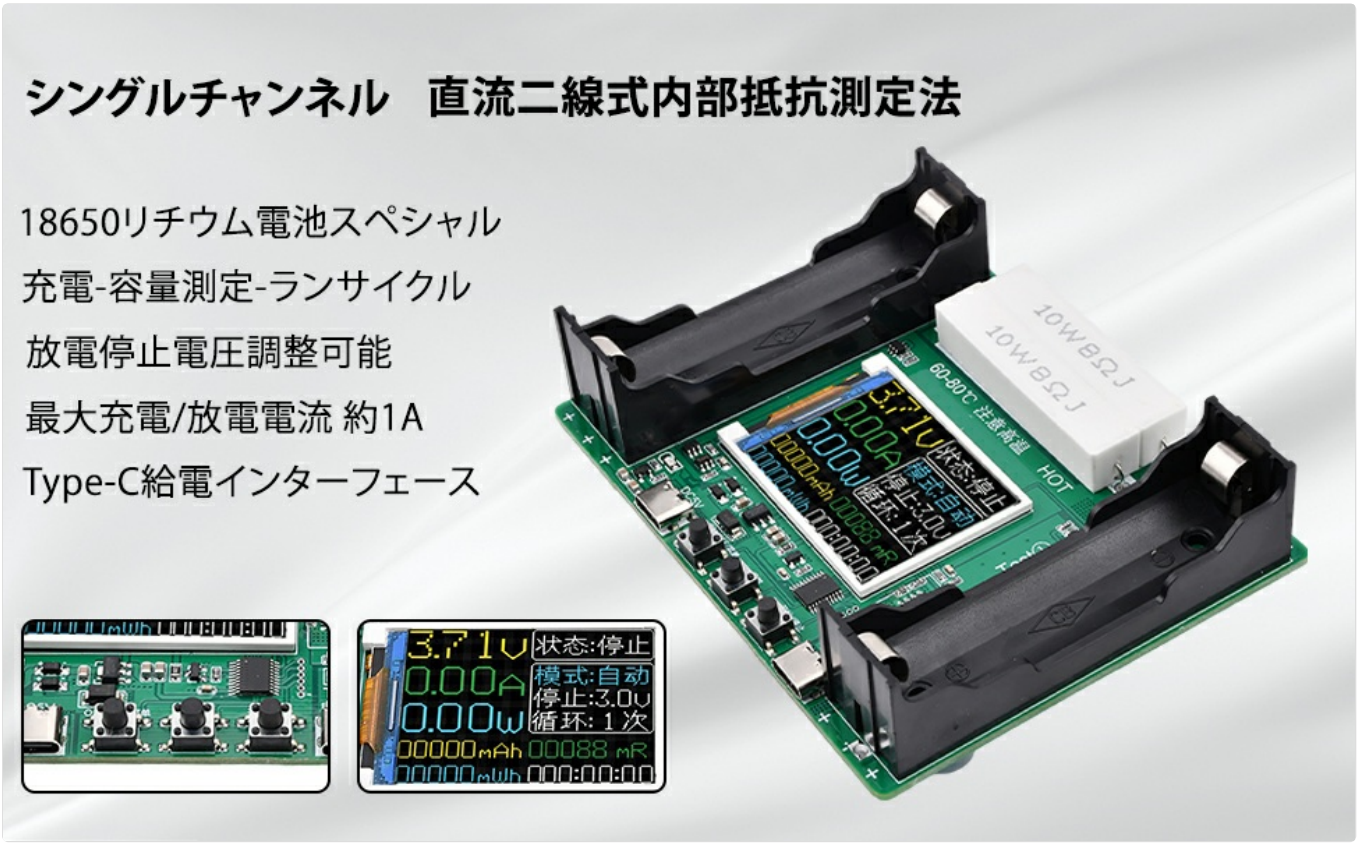


Figure 5: Single Channel DC Two-Wire Internal Resistance Measurement Method.

5.1. Measurement Accuracy Comparison

The table below compares the internal resistance measurements obtained from this product (using the 2-wire method) with those from a 4-wire internal resistance meter. Values are in milliohms (mΩ).

内部抵抗測定精度の比較

本製品は、電池の内部抵抗をテストするためにDC 2線式を使用しています。値は、電池が完全に充電されているときに正確です。テスト結果は、同じバッチのテスト電池間の参考比較に使用されます。内部抵抗の高精度の要件については、テストのために専門の内部抵抗計の4線式AC方式を使用してください。

テスト原理

直流インピーダンスは物理式R=V/Iに基づき、試験装置により電池に大きな直流定電流を短時間（通常2～3秒）流し（現在は10A～80Aの大電流が一般的）、この時の電池間電圧を測定して、電池の電流内部抵抗を式により算出する。

測定電圧(V)	本製品（ミリオーム）	4線式内部抵抗測定器（ミリオーム）
3.7	18	16
4.0	62	62
4.18	58	70
4.16	22	17
3.77	68	57
3.47	95	0
3.99	80	77
3.69	79	69
4.05	90	104
3.85	96	119

Figure 6: Comparison of Internal Resistance Measurement Accuracy.

5.2. Capacity Test Accuracy Standards

The following table presents the results of capacity tests performed on five LGABB4 18650 batteries (nominal capacity 2600mAh) using the automatic mode of this tester.

キャパシティ・テスト用精度基準

LGABB4 1865O 電池5本（公称容量2600mAh）を使用し、自動モードでテストした結果は以下の通りです。

バッテリー製造番号	電池内部抵抗（ミリオーム）	電池容量(mAh)
1	51	2650
2	56	2602
3	50	2609
4	63	2616
5	53	2643

Figure 7: Capacity Test Accuracy Standards.

6. Maintenance

To ensure the longevity and accurate performance of your Aideepen Battery Capacity Tester Module, follow these maintenance guidelines:

- **Cleaning:** Regularly wipe the device with a soft, dry cloth to remove dust and debris. Avoid using abrasive cleaners or solvents.
- **Storage:** Store the module in a cool, dry place away from direct sunlight, extreme temperatures, and high humidity.
- **Handling:** Handle the device with care. Avoid dropping it or subjecting it to strong impacts, which could damage internal components.
- **Battery Contacts:** Periodically inspect the battery contacts for any signs of corrosion or dirt. Clean them gently if necessary to ensure good electrical connection.

7. Troubleshooting

If you encounter issues with your Aideepen Battery Capacity Tester Module, consider the following common troubleshooting steps:

- **Device Not Powering On:**
  - Ensure the Type-C power cable is securely connected to both the module and a working DC5V power source.
  - If using an 18650 battery for power, ensure it is correctly inserted with the right polarity and is sufficiently charged.
- **Incorrect Readings:**
  - Verify that the battery being tested is compatible with the module (4.2V charged, 2.5-3.5V discharge stop).
  - Ensure the battery is properly seated in the test compartment with correct polarity.
  - Clean battery contacts if they appear dirty or corroded.
- **Test Not Starting/Stopping:**
  - Check if the discharge stop voltage is set correctly.
  - Ensure the "Start/Stop" button is pressed firmly.
- **Overheating:**
  - During discharge, the 10W 8Ω J resistors (10 in Figure 3) will generate heat. This is normal. Ensure adequate ventilation around the device.
  - If the device feels excessively hot, disconnect power and allow it to cool down before resuming operation.

If these steps do not resolve the issue, please refer to the Warranty and Support section for further assistance.

8. Specifications

Below are the detailed specifications for the Aideepen 18650 Battery Capacity Tester Module (Model X-HX0598A):

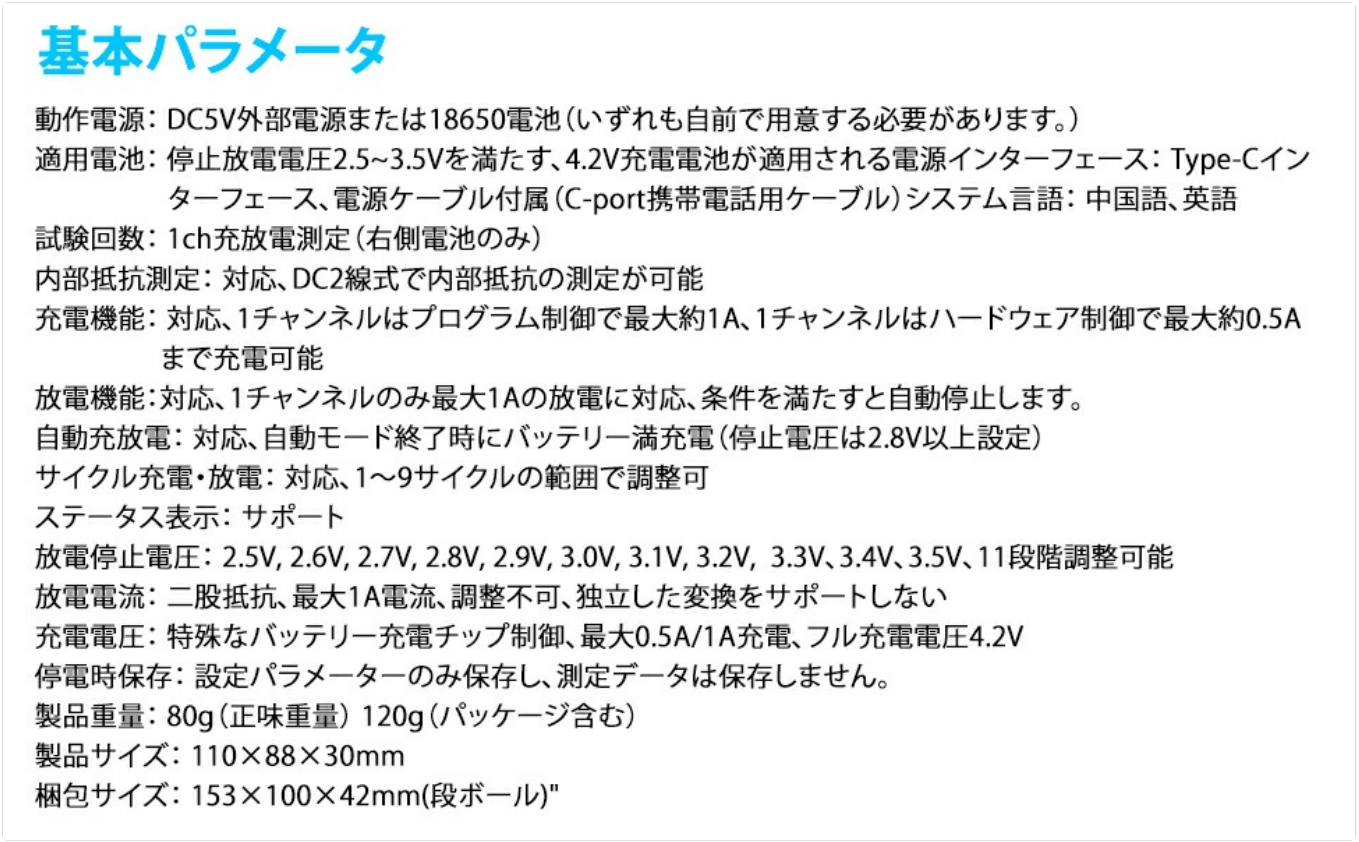


Figure 8: Basic Parameters of the Aideepen Battery Tester.

Feature	Detail
Model Number	X-HX0598A
Working Power	DC5V external power supply or 18650 battery (user-supplied)
Applicable Battery	Batteries with 4.2V charge and 2.5V-3.5V discharge stop voltage
Power Interface	Type-C interface (requires user-supplied C-port mobile phone cable)
Test Channels	1 channel for charge/discharge measurement (right battery compartment only)
Internal Resistance Measurement	Supported (DC 2-wire method)
Charging Function	Supported, 1 channel program control up to 1A, 1 channel hardware control up to 0.5A
Discharge Function	Supported, 1 channel max 1A discharge, automatic stop when conditions met
Automatic Charge/Discharge	Supported, battery fully charged at end of automatic mode (stop voltage 2.8V or higher)
Cycle Charge/Discharge	Adjustable from 1 to 9 cycles
Status Display	Supported
Discharge Stop Voltage	2.5V, 2.6V, 2.7V, 2.8V, 2.9V, 3.0V, 3.1V, 3.2V, 3.3V, 3.4V, 3.5V (11 adjustable steps)
Max Discharge Current	Approx. 1A (fixed, no independent adjustment)
Charging Current	Special battery charging chip, max 0.5A/1A charge, full charge 4.2V
Power-off Retention	Only set parameters are retained; measurement data is not retained.
Product Weight	80g (net weight), 120g (including package)

Feature	Detail
Product Dimensions	110 x 88 x 30 mm
Package Size	153 x 100 x 42 mm

9. Warranty and Support

Aideepen is committed to providing high-quality products and excellent customer service. We stand behind our products with a comprehensive warranty and support system.

- **Warranty Period:** Each product purchased from Aideepen comes with a 24-month service period.
- **Quality Issues:** If you experience any quality-related issues with your item within the warranty period, you are eligible for a new replacement.
- **Contact Support:** For any questions, technical assistance, or warranty claims, please contact Aideepen customer support through the platform where you purchased the product. Provide your order details and a clear description of the issue to facilitate a quick resolution.

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