User Manual

# EL15 DC Electronic Load

## High performance programmable Mini DC electronic load

User Manual

正点原子 ALIENTEK


### Revision history

| Version | Date | Modify |
|---|---|---|
| V1.0 | 2025/03/10 | First release |
| V1.1 | 2025/05/16 | Added manual reset and unit selection to battery capacity measurement. |
| V1.2 | 2025/07/03 | Added quick clear function for battery capacity measurement. |
| V1.3 | 2025/10/10 | Add Bluetooth, adjust param ranges |

# Contents

**Thank you for purchasing this product. In order to let you have a more complete understanding of the product features and operating methods, we recommend that you read this manual carefully before use.**

# Notes (Must Read)

1. Please use the equipment within the range specified in the manual to avoid instrument damage!
2. Do not use the equipment in flammable, explosive, wet, dusty, high temperature, strong electromagnetic interference and other harsh environment.
3. Do not block the load inlet and outlet, or insert a foreign body. Ensure good ventilation around the equipment!
4. Please use a compliant power supply to ensure proper operation of the device.
5. After accessing the power supply, do not contact the exposed terminal.
6. This equipment is a precision instrument, do not fall, knock, impact!! To avoid damage.
7. Do not disassemble! In case of electric shock or damage to the instrument!
8. If there is any discrepancy between the content of this manual and the physical instrument, please refer to the actual instrument.
9. If you encounter any usage problems, please contact our after-sales service. Do not attempt to dismantle the product privately!
10. The electronic load and the device under test must not be powered by the same power source or adapter!

# 1. Characteristic parameters

EL15 is a high-performance portable Mini DC electronic load instrument designed for use in the field of electronic testing. It is primarily used to simulate load conditions and is specifically designed for testing and validating the performance of DC power supplies, DC/DC converters, chargers, batteries, and other electronic devices. Its main features are as follows:

- 0.1~60V, 0~12A, 150W: High power capacity
- 4mm gold-plated banana jacks: easy to wire
- Supports remote sense input: Ensures accurate testing
- Supports four modes: Constant Voltage (CV), Constant Current (CC), Constant Resistance (CR), Constant Power (CP)
- Supports battery capacity testing and internal resistance testing

- Supports dynamic power testing and automatic testing
- Supports advanced functions such as list testing and sweep testing
- Six-fold protection functions: Robust and reliable
- 1.9-inch IPS LCD screen: Clear and intuitive display
- Full aluminum CNC casing: Premium quality and durability
- Supports firmware upgrade functionality
- Color LED indicator at the load input port: Brightness varies with power level
- Intelligent fan speed control: Quiet and energy-efficient

The basic specifications of the EL15 DC electronic load are shown in Table 1.0 below:

| Item | Description |
|---|---|
| Model | EL15 |
| Load Power | 150W(MAX) |
| Voltage Range | 0.1 ~ 60V |
| Current Range | 0 ~ 12A |
| Operating Modes | Constant Voltage (CV), Constant Current (CC), Constant Resistance (CR), Constant Power (CP) |
| Resolution | 1mV / 1mA |
| Input Interface | 4mm banana plug + XT30 |
| Power Supply Interface | TYPE-C(5V⎓2A) |
| Display | 1.9' IPS LCD 320*170 |
| Dimensions | 106mm * 65mm * 48mm |
| Net Weight | ≈300g |

Table 1.0 EL15 Basic Specifications

The detailed specifications of the EL15 DC electronic load are shown in Table 1.1 below:

| Item | Range | Resolution | Accuracy |
|---|---|---|---|
| Constant Voltage (CV) Mode | 0.1-60V | 1mV | ±(0.05%+0.1%FS) |
| Constant Current (CC) Mode | 0-12A | 1mA | ±(0.025%+0.025%FS) |
| Constant Resistance (CR) Mode | 0.1-7500R | 100mR | ±(0.1%+0.5%FS) |
| Constant Power (CP) Mode | 0-150W | 10mW | ±(0.1%+0.1%FS) |
| Voltage Readback | 0.1-60V | 1mV | ±(0.05%+0.1%FS) |
| Current Readback | 0-12A | 0.1mA | ±(0.025%+0.025%FS) |
| Power Readback | 0-150W | 1mW | ±(0.05%+0.1%FS) |
| Over Voltage Protection (OVP) | 0.5-62V | 100mV | -- |
| Over Current Protection (OCP) | 0.1-12.4A | 100mA | -- |
| Over Power Protection (OPP) | 0.5-153W | 100mW | -- |
| Under Voltage Protection (UVP) | 0.1 ~ 60V | 100mV | -- |
| Over Temperature Protection (OTP) | 50-90℃ | 1℃ | ±5℃ |
| Reverse Polarity Protection (RPP) | -- | -- | -- |

Table 1.1 EL15 Detailed Specifications

# 2. Quick Start

## 2.1 Appearance Description

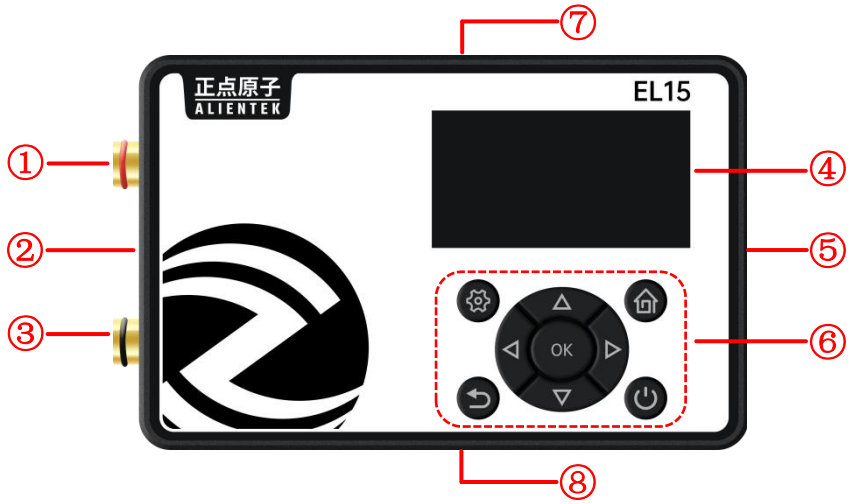


Figure 2.1 External View of the EL15 DC Electronic Load

① 4mm Load Input Port Positive (+) (Red)
② Remote Sense Input Port (XT30 Male Connector)
③ 4mm Load Input Port Negative (-) (Blue)
④ 1.9-inch IPS LCD Screen
⑤ USB TYPE-C Power Input Port
⑥ Multi-function Keypad
⑦ Heat Exhaust Vent
⑧ Heat Intake Vent

## 2.2 Button Functions

The functions and operation instructions for the 9 buttons on the device are shown in Table 2.2.

| Button | Single Click | Long Press |
|---|---|---|
| ⚙ | Enter / Exit Settings Interface | Invalid |
| ⌂ | Enter Main Interface | Invalid |
| OK | Confirm | Invalid |
| ⮌ | Exit / Return | Invalid |
| △ | Move Up / Adjust Value | Move Up / Adjust Value |
| ▽ | Move Down / Adjust Value | Move Down / Adjust Value |
| ◁ | Move Left / Return / Adjust Cursor | Move Left / Return / Adjust Cursor |
| ▷ | Move Right / Enter / Adjust Cursor | Move Right / Enter / Adjust Cursor |

| | | |
|---|---|---|
| ⏻ | Turn Load On / Off | Lock/Unlock Buttons |

Table 2.2 Button Functions Description

# 2.3 Connection for Testing

### 2.3.1 Precautions for Connecting the Device Under Test (DUT)

- Before connecting the DUT, ensure that the electronic load is turned off to avoid damage caused by inrush current or voltage during connection.
- The test leads used must have a rated current higher than the maximum output current of the DUT to ensure safety and reliability during testing. If the maximum current capacity of the test leads is insufficient, multiple leads can be connected in parallel.
- Pay attention to the correct polarity when connecting the wires to avoid damage to the equipment or measurement errors caused by reverse polarity.
- The electronic load and the device under test must not be powered by the same power source or adapter!

### 2.3.2 Local Measurement

The wiring method for local measurement is shown in Figure 2.3.2.1. This wiring method is suitable for quick measurement scenarios, where only two load wires (positive and negative) are required to connect the electronic load to the DUT. In this mode, the voltage measured by the load is the potential difference between the "LOAD+" and "LOAD-" terminals, not the actual output voltage of the DUT. Therefore, when the electronic load draws a large current, the voltage drop across the connection wires between the DUT and the load terminals will become significant, affecting measurement accuracy.

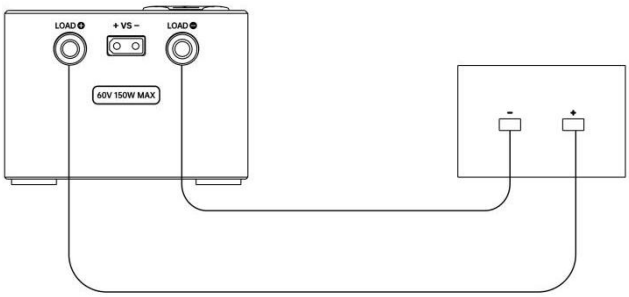


Figure 2.3.2.1 Wiring Diagram for Local Measurement

After completing the wiring, you need to configure the load wiring mode: **Settings → Connection→Local**, as shown in Figure 2.3.2.2.


Figure 2.3.2.2 Local Measurement Settings

### 2.3.3 Remote Measurement

The wiring method for remote measurement is shown in Figure 2.3.3.1. This wiring method is suitable for high-precision measurement scenarios. Four wires are required to connect the electronic load to the DUT: two load wires (positive and negative) for current transmission, and two remote sense wires (connected to the XT30 male connector) for detecting the actual output voltage of the DUT. In this mode, the load directly measures the output voltage of the DUT through the remote sense wires, eliminating the voltage drop caused by the resistance of the connection wires and ensuring measurement accuracy. Therefore, even when the electronic load draws a large current, the measurement results can still accurately reflect the true output voltage of the DUT.

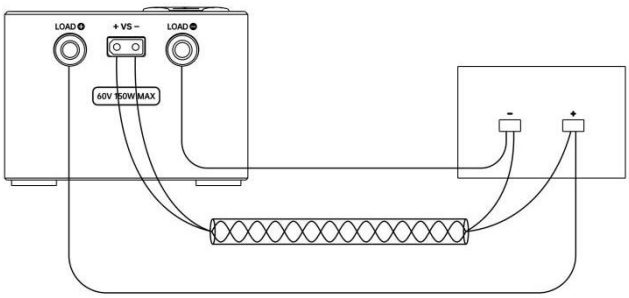


Figure 2.3.3.1 Wiring Diagram for Remote Measurement

It is recommended to use twisted-pair wires for the remote sense connections, and shielded cables should be used whenever possible to reduce external interference. Additionally, the wiring should be kept as short as possible to minimize signal attenuation and noise interference. After connecting to the remote sense input port, you need to configure the load wiring mode: **Settings→Connection→Remote**, to ensure measurement accuracy and proper system operation.


Figure 2.3.3.2 Remote Measurement Settings

# 3. Interface Description

## 3.1 Main Interface

When the instrument is powered on, it defaults to the main interface. The main interface includes five functional options: Basic Measurement, Battery Measurement, Power Supply Measurement, Advanced Measurement, and Settings, as shown in Figure 3.1.


Figure 3.1.1 Main Interface

The functional descriptions of the main interface are shown in Table 3.1.1.

| Option | Function |
|---|---|
| Basic Measurement | Includes four basic load modes (CC/CV/CR/CP). |
| Battery Measurement | Supports battery capacity testing and internal resistance testing modes. |
| Power Supply Measurement | Supports dynamic power supply testing and automatic testing modes. |
| Advanced Measurement | Supports list testing and sweep testing modes. |
| Settings | Used for detailed configuration of the instrument's various functions. |

Table 3.1.1 Main Interface Functional Description

## 3.2 System Settings Interface


3.2.1 System Settings Interface

The system settings interface contains a total of 12 items. The description, factory settings, and adjustable range for each item are shown in Table 3.2.1.

| Item | Description | Factory Setting | Adjustable Range |
|---|---|---|---|
| 1. Screen OFF | Sets the screen timeout duration. The system will turn off the screen after no operation for the set time. | 30 min | ● 5 min<br>● 10 min<br>● 30 min<br>● Never |
| 2. Temperature | Supports switching between two temperature units. | Celsius ℃ | ● Celsius ℃ |

| | | | |
|---|---|---|---|
| | | | ● Fahrenheit °F |
| 3. Language | Sets the system language. | 中文简体 | ● 中文简体<br>● 中文繁體<br>● English |
| 4. Buzzer | Sets the buzzer volume. | 2 | 0 ~ 4 |
| 5. Backlight | Sets the backlight brightness. | 7 | 1 ~ 10 |
| 6. Connection | Sets whether to use the remote sense input port. | Local | ● Local<br>● Remote |
| 7. OVP | Automatically shuts down if the input voltage exceeds the set value. | 62V | 0.5 ~ 62V |
| 8. OCP | Automatically shuts down if the input current exceeds the set value. | 12.5A | 0.1 ~ 12.5A |
| 9. OPP | Automatically shuts down if the input power exceeds the set value. | 153W | 0.5 ~ 153W |
| 10. OTP | Internal heatsink temperature exceeding the set value triggers protection.(The cooling fan will reach maximum speed before OTP is triggered.) | 90°C | (50 ~ 90°C) / (122 ~ 194°F) |
| 11. Log on | Sets the default interface when the load is powered on. | Main | ● Main<br>● Basic<br>● Battery<br>● Power<br>● Advanced |
| 12. Others | Restore Factory Settings: Restores all settings to factory defaults. | / | / |
| | Firmware Upgrade: Click to enter the upgrade interface. | / | / |
| | Bluetooth | Disabled | ● Disable<br>● Enable |
| 13. About | Displays manufacturer, model, serial number, hardware version, firmware version, Bluetooth name, and other information. | / | / |

Table 3.2.1 Settings Interface Functional Description

The system settings operation instructions are shown in Table 3.2.2.

| Button | Single Click | Long Press |
|---|---|---|
| | Enter Main Interface | Invalid |
| OK | Confirm | Invalid |
| | Exit / Return | Invalid |
| | Move Up / Adjust Value | Move Up / Adjust Value |
| | Move Down / Adjust Value | Move Down / Adjust Value |
| | Move Left / Return / Adjust Cursor | Move Left / Return / Adjust Cursor |
| | Move Right / Enter / Adjust Cursor | Move Right / Enter / Adjust Cursor |

Table 3.2.2 System Settings Interface Operation Instructions

# 3.3 Basic Measurement Interface

## 3.3.1 Operation Interface

In the operation interface, voltage, current, power, load switch status, and other information are displayed, as shown in Figure 3.3.1.


Figure 3.3.1 Basic Measurement Operation Interface

The functional description of the operation interface is shown in Table 3.3.1.1:

| No. | Function |
|---|---|
| ① | **Status Bar** includes the following:<br>1. **Load Switch**: ON - Enabled; OFF - Disabled<br>2. **Fan Speed**: indicates fan speed 0, indicates speed 1, and so on, up to a maximum speed of 5.<br>3. **Bluetooth Connection Status**: The icon will not be displayed if Bluetooth is not enabled or connected.<br>4. **Load Function**: Displays the currently active function.<br>5. **Key Lock Status**<br>6. **Operating Mode**: CC - Constant Current, CV - Constant Voltage, CR - Constant Resistance, CP - Constant Power. |
| ② | **Real-time Voltage** |
| ③ | **Real-time Current** |
| ④ | **Real-time Power** |
| ⑤ | **Working Time**: Records the real-time operating duration of the load. |
| ⑥ | ● Timer Mode enable: Displays remaining timer duration.<br>● Timer Mode disable: Displays device temperature. |
| ⑦ | Note: This position parameter can be adjusted using the buttons.<br>● CC Mode: Displays the set current value (Range: 00.000A ~ 12.000A)<br>● CV Mode: Displays the set voltage value (Range: 00.100V ~ 60.000V)<br>● CR Mode: Displays the set resistance value (Range: 0000.1 Ω ~ 7500.0 Ω )<br>● CP Mode: Displays the set power value (Range: 000.00W ~ 150.00W) |

Table 3.3.1.1 Basic Measurement Operation Interface Functional Description

The operation instructions are shown in Table 3.3.1.2:

| Button | Single Click | Long Press |
|---|---|---|
| | Enter / Exit Settings Interface | Invalid |
| | Enter Main Interface | Invalid |
| OK | Parameter Adjust / Confirm | Invalid |

| | | |
|---|---|---|
| ⮌ | Exit / Return to Previous Level | Invalid |
| ⏻ | Turn Load On / Off | Lock/Unlock Buttons |
| ◁ or ▷ | Move Cursor | Move Cursor |
| △ or ▽ | Adjust Value | Adjust Value |

Table 3.3.1.2 Basic Measurement Operation Interface Operation Instructions

### 3.3.2 Setting Interface

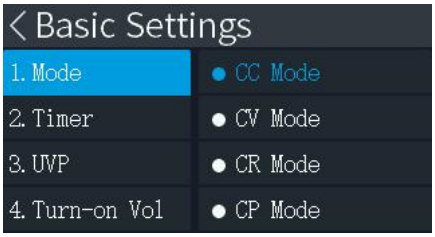


Figure 3.3.2 Basic Measurement Settings Interface

The descriptions, factory settings, and adjustable ranges of the items on the settings interface are shown in Table 3.3.2.1.

| Item | Description | Factory Setting | Adjustable Range |
|---|---|---|---|
| 1. Mode | Selects the mode in which the current function operates. | CC Mode | ● CC Mode<br>● CV Mode<br>● CR Mode<br>● CP Mode |
| 2. Timer | Supports enabling/disabling the timer mode. | Disable | ● Disable<br>● Enable |
| | Allows setting the timer duration. | 01:00:00 | 00:00:01 ~ 99:59:59 |
| 3. UVP[1] | Supports enabling/disabling under voltage protection. | Disabled | ● Disable<br>● Enable |
| | Automatically shuts down if the load input voltage is below the set value. | 3V | (0.1 ~ 60V) or<br>(0.1 ~ Turn-on Vol) |
| 4. Turn-on Vol[2] | Supports enabling/disabling auto turn-on. | Disabled | ● Disable<br>● Enable |
| | Automatically turns on if the load input voltage is above the set value. | 3.7V | (0.1 ~ 60V) or<br>(UVP ~ 60V) |

**Note 1**: When setting under voltage protection (UVP), if the turn-on voltage is not enabled, the adjustable range is between **0.1 ~ 60V**. If enabled, the range changes to **0.5 ~ the turn-on voltage value**. In this case, the maximum value of under voltage protection cannot exceed the turn-on voltage.

**Note 2**: When setting turn-on protection, if under voltage protection is not enabled, the adjustable range is between **0.1 ~ 60V**. If enabled, the range changes to **the UVP value ~ 60V**. In this case, the minimum value of the turn-on voltage cannot be lower than the under voltage protection setting.

Table 3.3.2.1 Basic Measurement Settings Interface Functional Description

The operation instructions for the settings interface are shown in Table 3.3.2.2.

| Button | Single Click | Long Press |
|---|---|---|
| ⚙ | Enter / Exit Settings Interface | Invalid |
| ⌂ | Enter Main Interface | Invalid |
| OK | Confirm | Invalid |

| | | |
|---|---|---|
| | Exit / Return | Invalid |
| | Move Up / Adjust Value | Move Up / Adjust Value |
| | Move Down / Adjust Value | Move Down / Adjust Value |
| | Move Left / Return / Adjust Cursor | Move Left / Return / Adjust Cursor |
| | Move Right / Enter / Adjust Cursor | Move Right / Enter / Adjust Cursor |

Table 3.3.2.2 Basic Measurement Settings Interface Operation Instructions

# 3.4 Battery Measurement

## 3.4.1 Operation Interface


Figure 3.4.1 Battery Measurement Operation Interface

The functional description of the operation interface is shown in Table 3.4.1.1.

| No. | Function |
|---|---|
| ① | Refer to the description in Table 3.3.1.1 for details. |
| ② | |
| ③ | |
| ④ | |
| ⑤ | ● Capacity Test Mode: Displays the first load current during testing.<br>● Internal Resistance Test Mode: Shows the initial load current during testing. |
| ⑥ | ● Capacity Test Mode: Press the button to enter or exit current setting mode. In current setting mode, this display shows the set current value (range: 0 ~ 12000mA); after exiting, it shows the measured battery energy in watt-hours (Wh).<br>● Internal Resistance Test Mode: Shows the second load current during testing. |
| ⑦ | ● Capacity Test Mode: Displays real-time measured capacity (units: Ah).<br>● Internal Resistance Test Mode: Displays measured DC internal resistance. |

Table 3.4.1.1 Battery Measurement Operation Interface Functional Description

The operation instructions are shown in Table 3.4.1.2.

| Button | | Single Click | Long Press |
|---|---|---|---|
| | | Enter / Exit Settings Interface | Invalid |
| | | Enter Main Interface | Invalid |
| OK | | Parameter Adjust / Confirm | Invalid |
| | | Exit / Return to Previous Level | Clear Capacity Measurement |
| | | Turn Load On / Off | Lock/Unlock Buttons |
| or | Capacity Test | Move Cursor | Move Cursor |

| | | | |
|---|---|---|---|
| | DCR Test | Invalid | Invalid |
| △ or ▽ | Capacity Test | Adjust Value | Adjust Value |
| | DCR Test | Invalid | Invalid |

Table 3.4.1.2 Battery Measurement Operation Interface Operation Instructions

### 3.4.2 Setting Interface

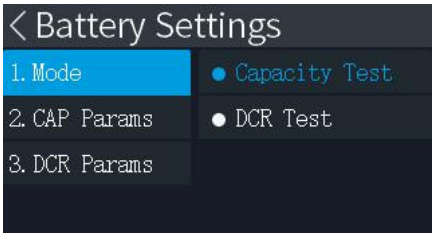


Figure 3.4.2 Battery Measurement Settings Interface

The descriptions, factory settings, and adjustable ranges of the items on the settings interface are shown in Table 3.4.2.1.

| Item | | Description | Factory Setting | Adjustable Range |
|---|---|---|---|---|
| 1. Mode | | Selects the mode in which the current function operates. | Capacity Test | ● Capacity Test<br>● DCR Test |
| 2. CAP Params | Timer | Supports enabling/disabling the timer mode. | Disable | ● Disable<br>● Enable |
| | | Allows setting the timer duration. | 01:00:00 | 00:00:01 ~ 99:59:59 |
| | Cutoff vol | The load automatically shuts down if the input voltage is below this set value. | 3.0V | 0.1 ~ 60V |
| | Record Clear | Clear the recorded capacity values and time. | / | / |
| 3.DCR Params | Current I1 | The first test current for internal resistance measurement. | 20mA | 20 ~ 12000mA |
| | Current I2 | The second test current for internal resistance measurement. | 1000mA | 20 ~ 12000mA |
| | Timer | Sets the duration for which the test current is applied. | 2S | 1 ~ 99S |

Table 3.4.2.1 Battery Measurement Settings Interface Functional Description

The operation instructions for the settings interface are shown in Table 3.4.2.2.

| Button | Single Click | Long Press |
|---|---|---|
| ⚙ | Enter / Exit Settings Interface | Invalid |
| ⌂ | Enter Main Interface | Invalid |
| OK | Confirm | Invalid |
| ↩ | Exit / Return | Invalid |
| △ | Move Up / Adjust Value | Move Up / Adjust Value |
| ▽ | Move Down / Adjust Value | Move Down / Adjust Value |
| ◁ | Move Left / Return / Adjust Cursor | Move Left / Return / Adjust Cursor |
| ▷ | Move Right / Enter / Adjust Cursor | Move Right / Enter / Adjust Cursor |

Table 3.4.2.2 Battery Measurement Operation Interface Operation Instructions

# 3.5 Power Supply Measurement

## 3.5.1 Operation Interface


Figure 3.5.1 Power Supply Measurement Operation Interface

The functional description of the operation interface is shown in Table 3.5.1.1.

| No. | Function |
|---|---|
| ① | Refer to the description in Table 3.3.1.1 for details. |
| ② | |
| ③ | |
| ④ | |
| ⑤ | ● Dynamic Test: Displays load current and duration for Current A.<br>● Auto Test: Shows estimated remaining time until measurement ends. |
| ⑥ | ● Dynamic Test: Displays load current and duration for Current B.<br>● Auto Test: Shows user-set Start Current. |
| ⑦ | ● Dynamic Test Mode: Displays remaining cycles for load operation.<br>● Auto Test Mode: Shows user-set ending current. |

Table 3.5.1.1 Power Supply Measurement Operation Interface Functional Description

The operation instructions are shown in Table 3.5.1.2.

| Button | Single Click | Long Press |
|---|---|---|
| ⚙ | Enter / Exit Settings Interface | Invalid |
| ⌂ | Enter Main Interface | Invalid |
| ↩ | Exit / Return to Previous Level | Invalid |
| ⏻ | Turn Load On / Off | Lock/Unlock Buttons |

Table 3.5.1.2 Power Supply Measurement Operation Interface Operation Instructions

## 3.5.2 Setting Interface

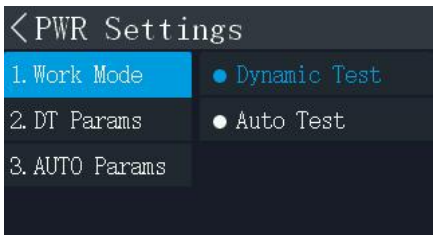


Figure 3.5.2 Power Supply Measurement Settings Interface

The descriptions, factory settings, and adjustable ranges of the items on the settings interface are shown in Table 3.5.2.1.

| Item | | Description | Factory Setting | Adjustable Range |
|---|---|---|---|---|
| 1. Mode | | Selects the mode in which the current function operates. | Dynamic Test | ● Dynamic Test<br>● Auto Test |
| 2. DT Params | CurrentA | Set value for Current A | 500mA | 20 ~ 12000mA |
| | Time A [2] | Duration for which Current A is maintained | 100ms | 1 ~ 99999.9ms |
| | CurrentB | Set value for Current B | 1000mA | 20 ~ 12000mA |
| | Time B [2] | Duration for which Current B is maintained | 100ms | 1 ~ 99999.9ms |
| | Cycle Switch | Controls whether cycle mode is enabled | Disabled | ● Disabled<br>● Enabled |
| | Cycle Count | In cycle mode, the load automatically shuts down after reaching the set number of cycles. | 1000 | 1 ~ 99999 |
| 3. AUTO Params | Rated Cur [1] | Nominal rated current of the input power supply | 1000mA | / |
| | Start Cur | Initial current value at which the load begins the test | 500mA | 20 ~ 12000mA |
| | End Cur | Final current value at which the load ends the test | 1500mA | 20 ~ 12000mA |
| | Step Cur | Increment/decrement value for each change in current from start to end current | 50mA | 1 ~ 1000mA |

**Note 1**: The adjustable range of the Rated Current is limited between the Start Current and the Stop Current. Therefore, when adjusting the Start Current and Stop Current, the value of the Rated Current may also be adjusted accordingly.

**Note 2**: The available time range varies depending on the hardware version (V1x: 1~99999.9 ms. V2x: 0.1~99999.9 ms)

Table 3.5.2.1 Power Supply Measurement Settings Interface Functional Description

The operation instructions for are shown in Table 3.5.2.2.

| Button | Single Click | Long Press |
|---|---|---|
|  | Enter / Exit Settings Interface | Invalid |
|  | Enter Main Interface | Invalid |
|  | Confirm | Invalid |
|  | Exit / Return | Invalid |
|  | Move Up / Adjust Value | Move Up / Adjust Value |
|  | Move Down / Adjust Value | Move Down / Adjust Value |
|  | Move Left / Return / Adjust Cursor | Move Left / Return / Adjust Cursor |
|  | Move Right / Enter / Adjust Cursor | Move Right / Enter / Adjust Cursor |

Table 3.5.2.2 Power Supply Measurement Operation Interface Operation Instructions

### 3.5.3 Automatic Test Report

After the load completes the automatic test, a test report will be generated and displayed, showing the performance parameters of the device under test (e.g., power supply or battery), as shown in Figure 3.5.3.


Figure 3.5.3 Automatic Test Report Interface

The detailed descriptions of each parameter in the test report are shown in Table 3.5.3.

| No. | Function |
|---|---|
| ① | **No-load Voltage ($V_{NL}$):** The output voltage of the device under test (DUT) under no-load conditions. |
| ② | **Maximum Current ($I_{MAX}$):** The maximum load current recorded during the test. |
| ③ | **Maximum Power ($P_{MAX}$):** The maximum input power recorded during the test. |
| ④ | **Load Regulation(δ):** Reflects the stability of the output voltage of the DUT under varying load conditions. Calculated as follows: $\delta = \frac{(V_{NL} - V_{Rated})}{V_{Rated}} \times 100\%$ A smaller value indicates better load regulation and more stable output voltage. |
| ⑤ | **Rated Voltage ($V_{Rated}$):** The output voltage of the DUT under rated load current conditions. |
| ⑥ | **Rated Current ($I_{Rated}$):** The nominal operating current of the DUT (set by the user, not a measured value). |
| ⑦ | **Rated Power ($P_{Rated}$):** The output power of the DUT under rated current load conditions. |

Table 3.5.3 Automatic Test Report Parameter Description Table

# 3.6 Advanced Measurement

## 3.6.1 Operation Interface


Figure 3.6.1 Advanced Measurement Operation Interface

The functional description of the operation interface is shown in Table 3.6.1.1.

| No. | Function |
|---|---|
| ① | Refer to the description in Table 3.3.1.1 for details. |
| ② | |
| ③ | |
| ④ | |

| | |
|---|---|
| ⑤ | ● List Test: Displays the timed duration of the currently executing step.<br>● Scan Test: Shows the low current value and its rise time. |
| ⑥ | ● List Test: Displays the current set value of the executing step.<br>● Scan Test: Shows the high current value and its fall time. |
| ⑦ | Cycle Mode records remaining unexecuted cycles when enabled. |

Table 3.6.1.1 Advanced Measurement Operation Interface Functional Description

The operation instructions for the operation interface are shown in Table 3.6.1.2.

| Button | Single Click | Long Press |
|---|---|---|
| ⚙ | Enter / Exit Settings Interface | Invalid |
| ⌂ | Enter Main Interface | Invalid |
| ↩ | Exit / Return to Previous Level | Invalid |
| ⏻ | Turn Load On / Off | Lock/Unlock Buttons |

Table 3.6.1.2 Advanced Measurement Operation Interface Operation Instructions

### 3.6.2 Setting Interface

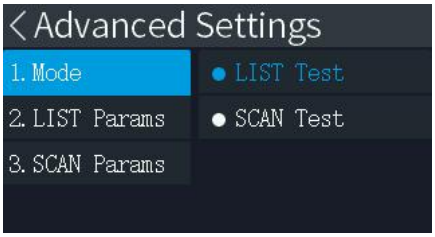


Figure 3.6.2 Advanced Measurement Settings Interface

The descriptions, factory settings, and adjustable ranges of the items on the settings interface are shown in Table 3.6.2.1.

| Item | | Description | Factory Setting | Adjustable Range |
|---|---|---|---|---|
| 1. Work Mode | | Selects the mode in which the current function operates. | LIST Test | ● LIST Test<br>● SCAN Test |
| 2. LIST Params | L0~L9 Set | **Switch:** Each step can be individually enabled. If disabled, the load will skip this step during execution. | Enabled | ● Disabled<br>● Enabled |
| | | **Current Set Value** | 500~5000mA | 20 ~ 12000mA |
| | | **Current Execution Duration** | 1000mS | 1 ~ 99999mS |
| | Cycle Switch | Controls whether cycle mode is enabled | Disabled | ● Disabled<br>● Enabled |
| | Cycle Count | In cycle mode, the load automatically shuts down after reaching the set number of cycles. | 1000 | 1 ~ 99999 |
| 3. SCAN Params | CurrentL | The low current value for the scan | 500mA | 20 ~ 11980mA |
| | Rise T [1] | The time required for the current to rise from the low current to the high current | 1mS | 1 ~ 99999mS |
| | CurrentH | The high current value for the scan | 2000mA | 20 ~ 12000mA |
| | Fall T [1] | The time required for the current to fall from the high current to the low current | 1mS | 1 ~ 99999mS |

| | | | | |
|---|---|---|---|---|
| | Cycle Switch | Controls whether cycle mode is enabled | Disabled | ● Disabled<br>● Enabled |
| | Cycle Count | In cycle mode, the load automatically shuts down after reaching the set number of cycles. | 1000 | 1 ~ 99999 |

**Note 1**: The available time range varies depending on the hardware version (V1x: 1~99999.9 ms. V2x: 0.1~99999.9 ms)

Table 3.6.2.1 Advanced Measurement Settings Interface Functional Description

The operation instructions for the settings interface are shown in Table 3.6.2.2 below:

| Button | Single Click | Long Press |
|---|---|---|
| ⚙ | Enter / Exit Settings Interface | Invalid |
| ⌂ | Enter Main Interface | Invalid |
| OK | Confirm | Invalid |
| ↩ | Exit / Return | Invalid |
| △ | Move Up / Adjust Value | Move Up / Adjust Value |
| ▽ | Move Down / Adjust Value | Move Down / Adjust Value |
| ◁ | Move Left / Return / Adjust Cursor | Move Left / Return / Adjust Cursor |
| ▷ | Move Right / Enter / Adjust Cursor | Move Right / Enter / Adjust Cursor |

Table 3.6.2.2 Advanced Measurement Operation Interface Operation Instructions

# 3.7 Firmware Upgrade

The firmware upgrade software, **ATK-EL15 UPGRADE**, is provided in the resource package. Follow the upgrade steps outlined in the software to proceed. Figure 3.7.1 demonstrates how to perform a local firmware upgrade operation:

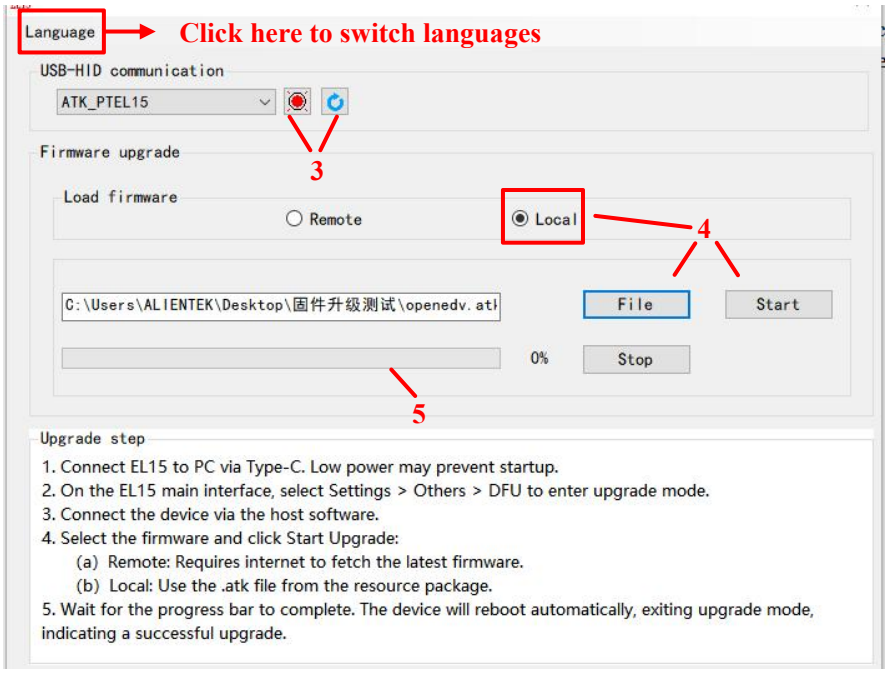


Figure 3.7.1 Firmware Upgrade Host Computer Operation Instructions Diagram

# 3.7 Bluetooth

Search for "atk-xtool" in the application store, find the "atk-xtool" software, download and install it. At the same time, turn on the Bluetooth function in the settings menu of the EL15 device.


Figure 4.4.1 Bluetooth function instructions

After successfully connecting to Bluetooth, you can use the APP to set some parameters for the device and check its status.

# 4. Function Introduction

## 4.1 Basic Measurement Functions

The basic measurement function offers four operating modes. Additionally, settings such as timer duration, turn-on voltage, and under-voltage protection can be configured to control the automatic turn-on/off of the load. Detailed descriptions of the different operating modes are shown in Table 4.1:

| Mode | Description |
|---|---|
| Constant Current (CC) | Regardless of changes in the input voltage, the electronic load always consumes a constant current. |
| Constant Voltage (CV) | The electronic load will draw sufficient current to maintain the input voltage at a constant value. |
| Constant Resistance (CR) | The electronic load is equivalent to a constant resistor, linearly adjusting the input current as the input voltage changes. |
| Constant Power (CP) | If the input voltage increases, the electronic load will reduce the input current to maintain the consumed power (P = V × I) at a constant value. |

Table 4.1 Introduction to Basic Measurement Functions

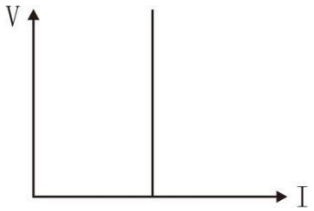


Figure 4.1.1 CC Mode

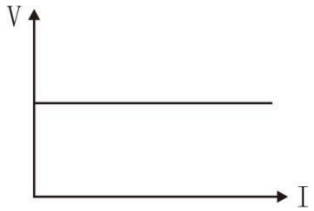


Figure 4.1.2 CV Mode

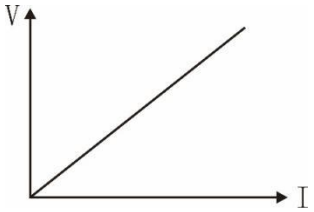


Figure 4.1.3 CR Mode

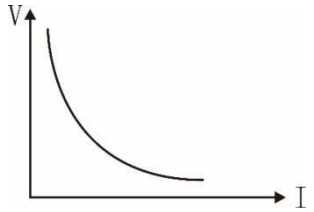


Figure 4.1.4 CP Mode

## 4.2 Battery Measurement Functions

### 4.2.1 Capacity Test (CAP)

Capacity measurement involves recording parameters such as discharge time, current, and voltage through constant-current discharge to accurately calculate the actual capacity (unit: Ah/Wh) of a battery or energy storage device. This feature allows users to set cutoff conditions (voltage,

time), and the load will automatically shut off when the conditions are met to ensure battery safety. It is suitable for applications such as battery capacity evaluation, energy storage device testing, battery aging analysis, and product quality inspection.

### 4.2.2 DC Internal Resistance Test (DCR)

**Principle of DC Internal Resistance Measurement:** First, measure the input voltage V1 after briefly applying a discharge current I1. Then, measure the input voltage V2 after applying a discharge current I2. Finally, calculate the DC internal resistance R based on the change in input voltage when the load current changes.

$$R = (V1 - V2)/(I2 - I1)$$

**Note:** The selected discharge current should not exceed the maximum allowable value of the device under test to avoid overheating, damage, or reduced lifespan.

## 4.3 Power Supply Measurement Functions

### 4.3.1 Dynamic Test (DT)

The dynamic test allows users to set two different load currents and their corresponding test durations. During the test, the load will automatically switch between these two current values based on the set durations, simulating real-world load variations.

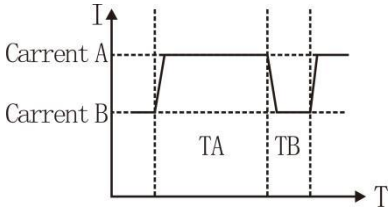


Figure 4.3.1 Dynamic Test Current-Time Graph

### 4.3.2 Automatic Test (AUTO)

The automatic test function is an intelligent testing mode. By setting four parameters—initial current, rated current, end current, and step current—the load automatically performs a step-by-step test from the initial current to the end current, records key data (such as no-load voltage, rated voltage, maximum power, etc.), and finally generates a test report. The detailed test process is as follows:

1. Measure the no-load voltage.
2. Gradually change the current from the initial current to the end current, with each step equal to the set step current value.
3. Throughout the process, record the power supply's output voltage, current, and power.
4. If a short circuit occurs during the test, the load will immediately stop after recording the short-circuit current. If no short circuit occurs, the load will stop after reaching the end current.
5. After the load stops, the screen will display a test report as shown in Figure 3.5.3

# 4.4 Advance Measurement Functions

### 4.4.1 List Test (LIST)

The list test allows users to perform complex multi-condition testing on power supplies or batteries using predefined test steps. Each step can be independently set to operate in constant current mode, and users can customize parameters such as load current and duration for each step. This is suitable for scenarios requiring multi-condition verification.

### 4.4.2 Scan Test (SCAN)

The scan test function is a dynamic test mode in the electronic load, used to simulate the process of load current continuously changing between a set low current (CurrentL) and high current (CurrentH). By setting the rise time (Rise T) and fall time (Fall T), users can test the response characteristics of power supplies or batteries under dynamic load conditions.

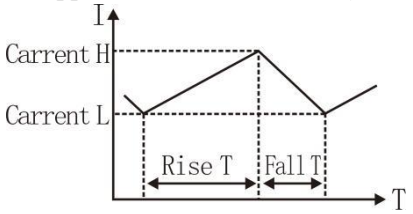


Figure 4.4.2 Scan Test Current-Time Graph

# 5. FAQs

| Issue/Phenomenon | Solution |
|---|---|
| Host Computer Connection Failure | 1. Check if the Type-C cable supports data communication.<br>2. Try powering off and then restarting the EL15.<br>3. Contact after-sales support. |
| Device Fails to Power On or Restarts | 1. Check if the Type-C cable is properly connected.<br>2. Ensure the power supply meets the requirements (5V 2A).<br>3. Contact after-sales support. |
| Large Voltage Display Deviation | Use the remote sense interface for compensation. |
| Screen Displays "Load Abnormal!" | Contact after-sales support. |
| Screen Displays "Power shortage!" | When this prompt appears, the load can still perform operations like "firmware upgrade." If load functions are required, switch to a suitable power supply; otherwise, the device may shut down and restart. |
| | |

Table 5.1 Summary of Common Issues

# 6. Warranty Terms

EL15 host has a one-year free warranty service in the case of non-artificial damage. Please contact the dealer for warranty service.

# 7. Contact Us

Official store : https://www.aliexpress.com/store/1102909571
Download Resources: www.alientek.com
Technical forum : http://www.openedv.com/forum.php

Company website : www.alientek.com
Email Address : fae-smt@alientek.com
Fax: 020-36773971
Tel: 020-38271790