Aoleaby IT8512A+

Aoleaby IT8512A+ Programmable Electronic Load User Manual

Model: IT8512A+

1. Introduction

The Aoleaby IT8512A+ is a high-accuracy programmable electronic load designed for various testing applications. It offers precise control and measurement capabilities for voltage, current, and power, making it suitable for power supply testing, battery discharge testing, and other electronic component evaluations. This manual provides essential information for the safe and effective operation of the IT8512A+.

Key Features:

- Four operating modes: Constant Current (CC), Constant Voltage (CV), Constant Resistance (CR), and Constant Power (CW).
- High resolution: Up to 0.1mV for voltage and 1mA for current measurements.
- Dynamic mode with frequencies up to 10KHz for transient response testing.
- Integrated protection functions: Over Voltage Protection (OVP), Over Current Protection (OCP), Over Power Protection (OPP), and Over Temperature Protection (OTP).
- Specialized functions: Battery test, automatic test, and short-circuit test.

2. Product Overview

Familiarize yourself with the front and rear panels of the IT8512A+ electronic load.

Figure 2.1: Front panel of the Aoleaby IT8512A+ Programmable Electronic Load, showing the display, control knob, function buttons, and input terminals.

Figure 2.2: Rear panel of the Aoleaby IT8512A+ Programmable Electronic Load, featuring the AC power input, cooling vents, and communication ports.

3. Setup and Connection

1. **Unpacking:** Carefully remove the electronic load from its packaging. Inspect for any signs of damage during transit.
2. **Power Connection:** Connect the provided AC power cord to the power input on the rear panel (refer to Figure 2.2) and then to a suitable AC power outlet (220V/110V, as specified for your region).
3. **Load Connection:** Connect the device under test (DUT) to the input terminals on the front panel. Ensure correct polarity (positive to positive, negative to negative) and secure connections to prevent arcing or poor contact.
4. **Ventilation:** Ensure adequate ventilation around the unit. Do not block the cooling vents on the sides and rear panels.
5. **Power On:** Press the power switch, typically located on the front or rear panel, to turn on the unit. The display should illuminate.

4. Operating Modes

The IT8512A+ supports four primary operating modes:

4.1. Constant Current (CC) Mode

In CC mode, the electronic load draws a constant current regardless of the input voltage. This mode is ideal for testing power supplies, batteries, and current sources.

- **Setting Current:** Use the control knob and function buttons to set the desired current value.
- **Ranges:** 0-3A (Resolution: 0.1mA), 0-30A (Resolution: 1mA).

4.2. Constant Voltage (CV) Mode

In CV mode, the electronic load maintains a constant voltage across its input terminals by adjusting the current drawn. This is useful for testing current-limited power supplies or battery chargers.

- **Setting Voltage:** Use the control knob and function buttons to set the desired voltage value.
- **Ranges:** 0-18V (Resolution: 1mV), 0-150V (Resolution: 10mV).

4.3. Constant Resistance (CR) Mode

In CR mode, the electronic load simulates a constant resistance. The current drawn is proportional to the input voltage (I = V/R). This mode is suitable for testing power supplies under resistive load conditions.

- **Setting Resistance:** Use the control knob and function buttons to set the desired resistance value.
- **Ranges:** 0.05-10 Ohms (Resolution: 0.01 Ohm), 10-7.5K Ohms (Resolution: 1 Ohm).

4.4. Constant Power (CW) Mode

In CW mode, the electronic load draws a constant power from the source. The current drawn will adjust inversely with the input voltage to maintain the set power (P = V * I).

- **Setting Power:** Use the control knob and function buttons to set the desired power value.
- **Range:** 0-300W (Resolution: 10mW).

5. Advanced Functions

5.1. Dynamic Test Function

The dynamic test function allows for simulating transient load conditions, useful for evaluating the transient response of power supplies. It supports continuous, pulse, and toggle modes with frequencies up to 10KHz.

- **Accessing Dynamic Mode:** Refer to the device's on-screen menu or specific function button for dynamic test settings.
- **Parameters:** Configure parameters such as frequency, duty cycle, and load levels (A1/A2 or V1/V2 depending on the primary mode).

5.2. Battery Test Function

This function is designed for evaluating battery capacity and discharge characteristics. It allows setting discharge current, cut-off voltage, and monitoring discharge time and capacity.

- **Setup:** Connect the battery to the load terminals. Set the desired discharge current and the battery's cut-off voltage.
- **Monitoring:** The unit will display real-time voltage, current, discharged capacity (Ah), and discharge time.

5.3. Automatic Test Function

The automatic test function allows for programming a sequence of test steps, each with different load conditions

(mode, voltage, current, resistance, power, and duration). This is useful for automated testing and characterization.

- **Programming Steps:** Define each step's parameters through the user interface.
- **Execution:** Start the sequence, and the load will automatically cycle through the programmed steps.

5.4. Short-Circuit Test Function

This function allows for simulating a short-circuit condition to test the protection mechanisms of power supplies. The load can draw approximately 3A or 30A depending on the range, with a resistance of about 40mΩ.

6. Specifications

The following table details the technical specifications of the Aoleaby IT8512A+ Programmable Electronic Load.

Parameter	Specification
Input Rating	300W / 150V / 30A
CC Mode Range	0-3A (0.1mA resolution), 0-30A (1mA resolution)
CC Mode Accuracy	0.05% + 0.05%FS
CR Mode Range	0.05-10Ω (0.01Ω resolution), 10-7.5KΩ (1Ω resolution)
CR Mode Accuracy	0.01% + 0.08S, 0.01% + 0.0008S
CV Mode Range	0-18V (1mV resolution), 0-150V (10mV resolution)
CV Mode Accuracy	0.05% + 0.02%FS, 0.05% + 0.025%FS
CW Mode Range	0-300W (10mW resolution)
CW Mode Accuracy	±(0.1% + 0.1%FS)
Voltage Measurement Range	0-18V (0.1mV resolution), 0-150V (1mV resolution)
Voltage Measurement Accuracy	0.025% + 0.025%FS
Current Measurement Range	0-3A (0.1mA resolution), 0-30A (1mA resolution)
Current Measurement Accuracy	0.05% + 0.05%FS
Power Measurement Range	300W (10mW resolution)
Power Measurement Accuracy	0.1% + 0.1%FS
Short Circuit Current	Approx. 3A/30A
Short Circuit Resistance	Approx. 40mΩ
Input Terminal Impedance	150KΩ
Protection (OPP/OCP/OVP/OTP)	Approx. 320W / 33A / 160V / 85°C
Dimensions (WxHxD)	214.5 x 88.2 x 354.6 mm
Item Weight	18.74 pounds

7. Maintenance

- **Cleaning:** Regularly clean the exterior of the unit with a soft, dry cloth. Do not use abrasive cleaners or solvents. Ensure the unit is powered off and disconnected from the mains before cleaning.
- **Ventilation:** Keep the cooling vents clear of dust and obstructions to ensure proper airflow and prevent overheating.
- **Storage:** When not in use for extended periods, store the unit in a dry, dust-free environment within its specified operating temperature range.
- **Inspection:** Periodically inspect power cords and connection cables for any signs of damage. Replace damaged cables immediately.

8. Troubleshooting

This section provides solutions to common issues encountered during operation.

- **Unit does not power on:**
  - Check if the power cord is securely connected to both the unit and the AC outlet.
  - Verify that the AC outlet is functional.
  - Ensure the power switch is in the 'ON' position.
- **No load current/voltage displayed:**
  - Ensure the device under test (DUT) is properly connected to the input terminals with correct polarity.
  - Verify that the DUT is powered on and supplying voltage/current.
  - Check the selected operating mode and ensure parameters are set correctly.
- **Over-protection error (OVP, OCP, OPP, OTP):**
  - An over-protection error indicates that the input voltage, current, power, or internal temperature has exceeded safe limits.
  - Reduce the input power or adjust the load settings to stay within the unit's specifications.
  - Ensure adequate ventilation to prevent overheating (OTP).
- **Inaccurate readings:**
  - Ensure proper calibration. If persistent, contact support.
  - Check for loose connections or damaged cables.

9. Warranty and Support

The Aoleaby IT8512A+ Programmable Electronic Load is covered by a standard manufacturer's warranty. For specific warranty terms and conditions, please refer to the documentation provided with your purchase or contact Aoleaby customer support.
For technical assistance, troubleshooting beyond this manual, or service inquiries, please contact Aoleaby customer support through their official website or the contact information provided at the time of purchase. When contacting support, please have your model number (IT8512A+) and purchase details readily available.