

## UCTRONICS RS2818

# UCTRONICS Electronic USB Load Tester Instruction Manual

Model: RS2818

### 1. PRODUCT OVERVIEW

The UCTRONICS Electronic USB Load Tester is a versatile device designed for testing and evaluating various USB power sources, including chargers, power banks, and cables. It functions as an adjustable discharge resistor module with a maximum discharging power of 35W and supports current ranges from 0.03A to 5.00A. This module is equipped with intelligent temperature control and a cooling fan to ensure stable operation during testing.

Beyond basic load testing, it can also detect and trigger various fast charge protocols such as QC2.0, QC3.0, AFC, and FCP, supporting output voltages of 5V, 9V, 12V, and 20V. Its comprehensive safety features, including anti-reverse protection, overvoltage protection (OVP), overcurrent protection (OCP), over-power protection (OPP), low-voltage protection (LVP), and over-temperature protection (OTP), make it a reliable tool for electronic enthusiasts and professionals.



Figure 1.1: UCTRONICS Electronic USB Load Tester, showcasing its compact design with an integrated cooling fan and LCD display.

## 2. KEY COMPONENTS AND INTERFACES

Familiarize yourself with the main components and connection interfaces of the USB Load Tester:

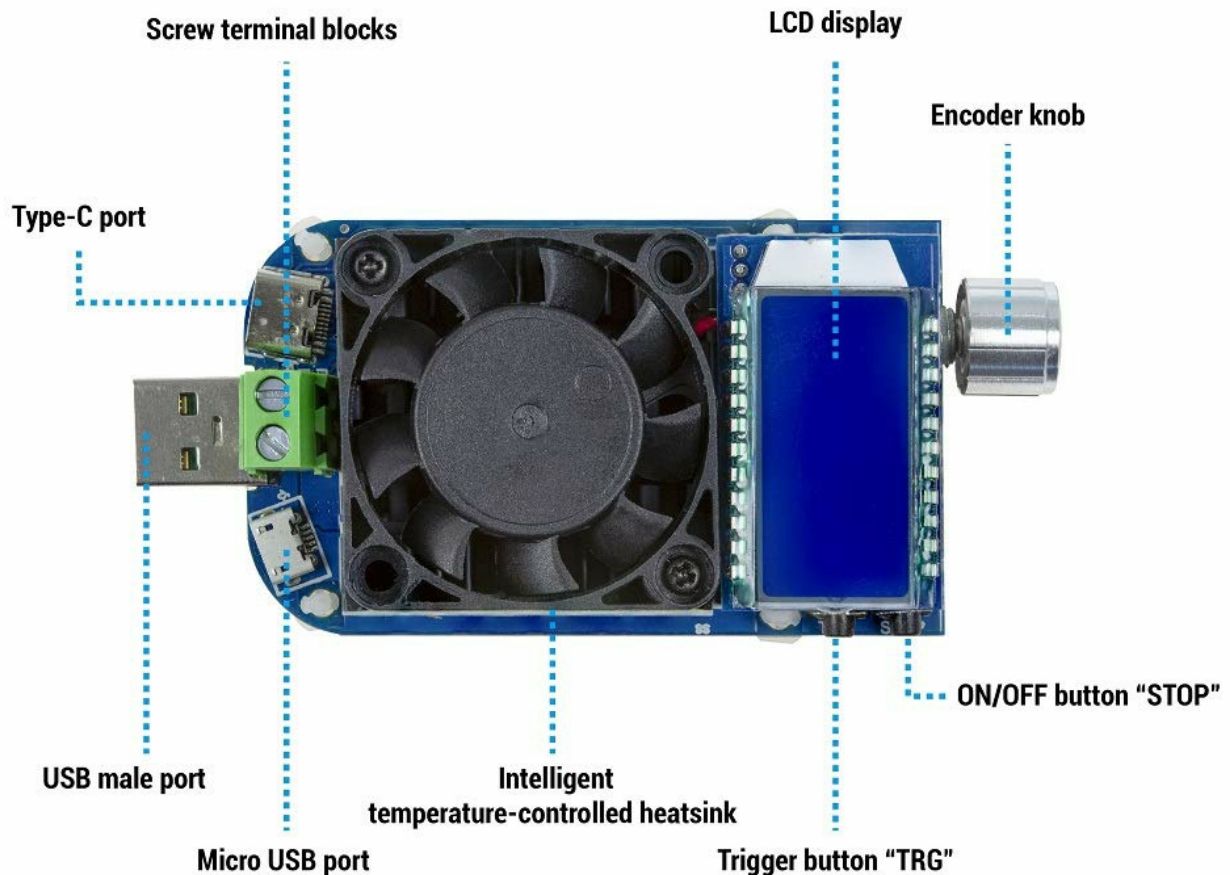
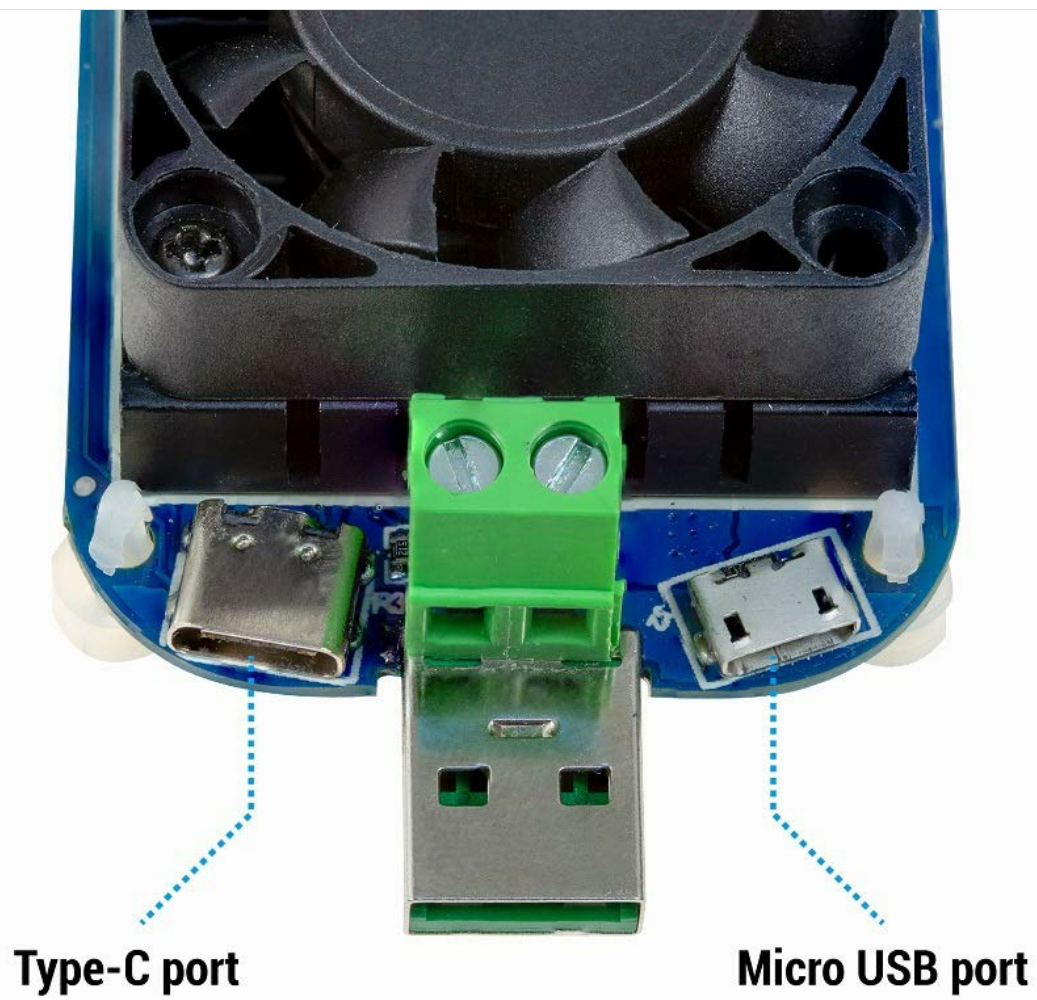


Figure 2.1: Labeled diagram of the USB Load Tester, highlighting its key components.

- **USB Male Port:** Standard USB-A connector for direct connection to USB power sources.
- **Micro USB Port:** Input port for connecting devices via Micro USB cable.
- **Type-C Port:** Input port for connecting devices via USB Type-C cable.
- **Screw Terminal Blocks:** External wiring ports for connecting power sources that do not use standard USB connectors.
- **Intelligent Temperature-Controlled Heatsink with Cooling Fan:** Dissipates heat generated during discharge, ensuring stable operation and preventing overheating.
- **LCD Display:** Shows real-time voltage, current, power, capacity (Ah), energy (Wh), and elapsed time.
- **Encoder Knob:** Used to navigate menus, adjust current values, and select modes. It can also be pressed for confirmation.
- **"TRG" (Trigger) Button:** Initiates fast charge protocol detection or mode selection.
- **"STOP" (ON/OFF) Button:** Functions as an ON/OFF switch for the discharge process.



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Figure 2.2: Detailed view of the Type-C and Micro USB input ports.



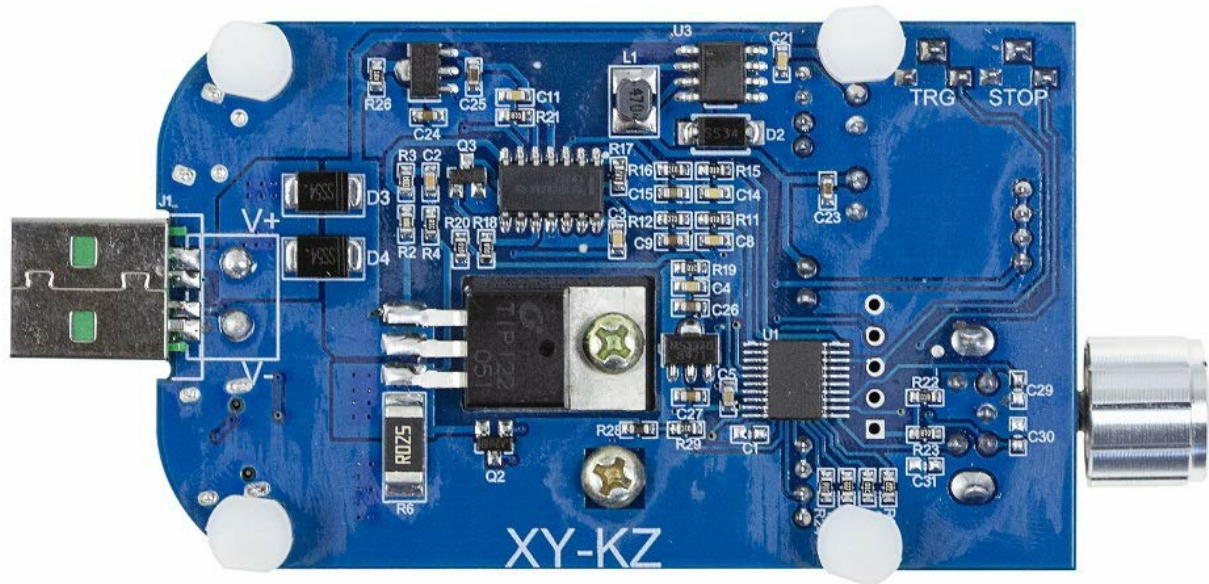


Figure 2.3: Underside view of the module, revealing the printed circuit board (PCB) and components.

### 3. SETUP AND INITIAL OPERATION

1. **Powering On:** Connect the USB Load Tester to a USB power source (e.g., charger, power bank) using the appropriate input port (USB-A male, Micro USB, Type-C, or screw terminals). The LCD display will light up, indicating the device is powered on.
2. **Initial Display:** Upon power-on, the display will typically show the input voltage and a flashing current value (e.g., "0.00A" or a previously set value). A flashing current value indicates that the module is in an "off" state and not actively discharging current.

## 4. OPERATING INSTRUCTIONS

### 4.1. Testing Quick Charge Protocols

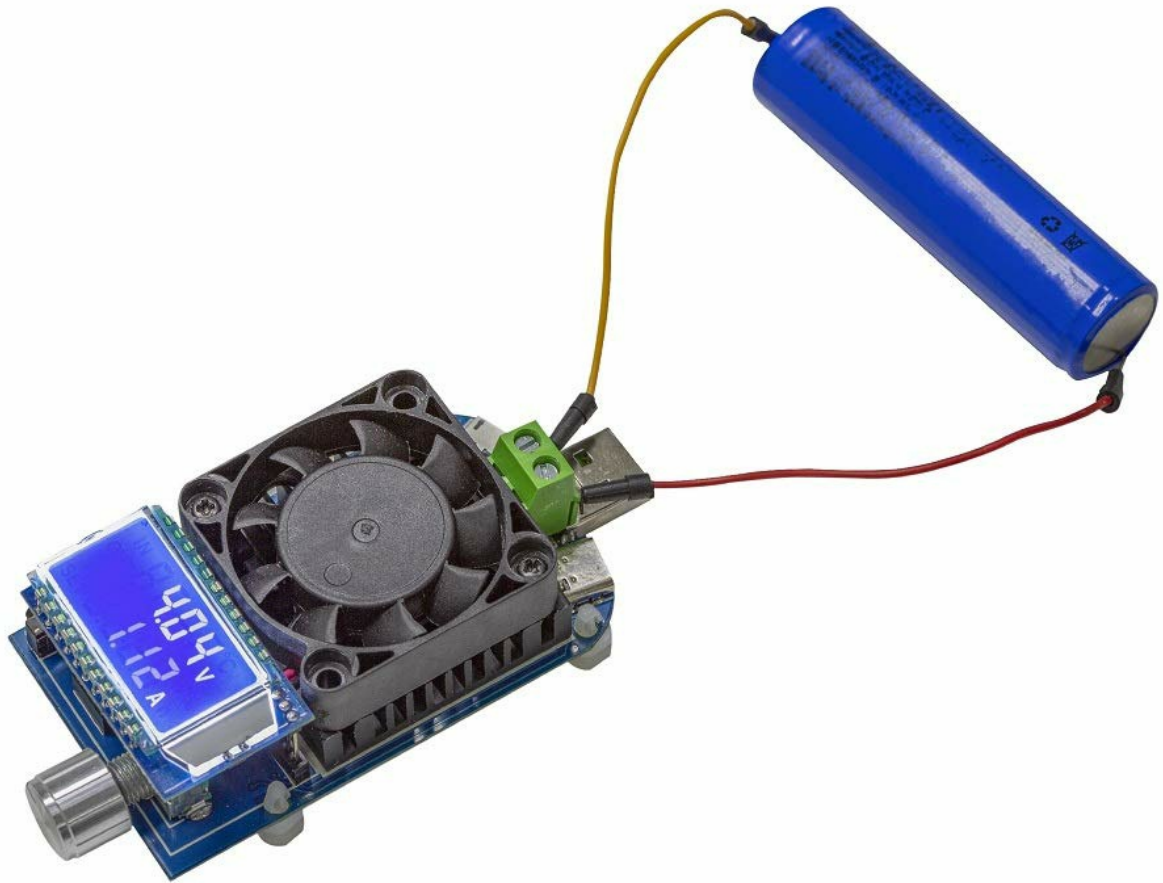
To determine the fast charge protocols supported by a charger and trigger specific voltages:

1. Connect the charger to the USB Load Tester using any of its input ports.
2. Press and hold the "TRG" (Trigger) button for a few seconds. The module will begin communicating with the charger to identify compatible fast charge protocols (e.g., QC2.0, QC3.0, AFC, FCP).
3. The LCD will cycle through the detected protocols and their corresponding voltages (e.g., 5V, 9V, 12V, 20V).
4. To manually select a compatible mode, briefly press the "TRG" button. Then, rotate the encoder knob to cycle through the available modes. Press the encoder knob to confirm your selection. The module will then attempt to trigger that specific voltage from the charger.

### 4.2. Performing Load Tests (Discharge)

To perform a constant current discharge test on a power source:

1. Ensure the module is connected to the power source you wish to test. The current value on the LCD should be flashing, indicating it's in the "off" state.
2. Rotate the encoder knob to adjust the desired discharge current. The current value will change on the display.
3. Once the desired current is set, press the "STOP" (ON/OFF) button. The current value will stop flashing, and the module will begin discharging at the set current. The fan will activate if necessary to maintain temperature.
4. During discharge, the LCD will display real-time voltage and current. Press the encoder knob briefly to cycle through other displayed metrics:
  - **Power (W)**: Instantaneous power consumption.
  - **Capacity (Ah)**: Accumulated charge discharged in Ampere-hours.
  - **Energy (Wh)**: Accumulated energy discharged in Watt-hours.
  - **Elapsed Time (h)**: Duration of the discharge test.
5. To stop the discharge, press the "STOP" (ON/OFF) button again. The current value will start flashing, indicating the discharge has ceased.



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Figure 4.1: The load tester connected to a battery, demonstrating its use in discharge testing.



Figure 4.2: The load tester connected to a wall charger, used for evaluating charger performance.

## 5. SAFETY FEATURES AND PROTECTIONS

The UCTRONICS USB Load Tester incorporates several safety mechanisms to protect both the device and the connected power source:

- **Anti-Reverse Protection:** Prevents damage if the input polarity is accidentally reversed.
- **Overvoltage Protection (OVP):** Automatically stops discharge if the input voltage exceeds a safe limit (adjustable).
- **Overcurrent Protection (OCP):** Stops discharge if the current draw exceeds the set maximum.
- **Over-Power Protection (OPP):** Stops discharge if the power consumption exceeds the maximum rated power (35W, adjustable).
- **Low-Voltage Protection (LVP):** Stops discharge if the input voltage drops below a critical threshold, protecting the power source from deep discharge.



- **Over-Temperature Protection (OTP):** The intelligent cooling fan and internal circuitry prevent the device from overheating during prolonged use.

These protection limits can often be adjusted via the device's menu. To access and adjust these settings, refer to the device's on-screen menu by pressing and holding the encoder knob. The display will show options like OVP, OHP (Over-Hour Protection), OAH (Over-Ampere-Hour Protection), and OPP.



Figure 5.1: The LCD display showing adjustable protection settings for safe operation.

## 6. TROUBLESHOOTING

- **Device Not Powering On:**

Ensure the power source is active and providing sufficient voltage (DC 4.0-25.0V). Check all cable connections for proper seating. Try a different power source or cable.

- **Current Setting Stuck/Cannot Adjust:**

If the current setting is unresponsive, try disconnecting and reconnecting the power. Ensure the device is in the

"off" state (flashing current value) before attempting to adjust the current with the encoder knob. If the issue persists, a factory reset might be needed (refer to advanced settings if available, or contact support).

• **"OPP" Flashing on Display:**

This indicates Over-Power Protection has been triggered. The current power draw (Voltage x Current) exceeds the set OPP limit. Reduce the discharge current or adjust the OPP setting if appropriate for your test setup.

• **Fan Not Spinning:**

The fan is temperature-controlled and will only activate when the heatsink reaches a certain temperature during discharge. If the fan does not spin even under high load, ensure there are no obstructions and contact support if necessary.

• **Inaccurate Readings:**

Ensure connections are secure and clean. For cable quality testing, note that a significant voltage drop indicates a lower quality cable. Compare readings with a calibrated multimeter if precision is critical.

7. MAINTENANCE

To ensure the longevity and optimal performance of your UCTRONICS USB Load Tester:

- **Cleaning:** Use a soft, dry cloth to clean the device. Avoid using liquids or abrasive cleaners. Ensure the fan and heatsink fins are free from dust and debris for efficient cooling.
- **Storage:** Store the device in a cool, dry place away from direct sunlight and extreme temperatures.
- **Handling:** Handle the device with care. Avoid dropping it or subjecting it to strong impacts, as this can damage internal components or the LCD screen.

8. SPECIFICATIONS

Feature	Specification
Model Number	RS2818
Brand	UCTRONICS
Rated Operational Voltage	DC 4.0-25.0V
Max Discharging Power	35W
Rated Operational Current	0.03-5.00A
Supported Fast Charge Protocols	QC2.0, QC3.0, AFC, FCP
Trigger Output Voltages	5V, 9V, 12V, 20V
Connection Ports	USB-A Male, Micro USB, Type-C, External Wiring Port

Feature	Specification
Cooling	Intelligent Temperature Control with Cooling Fan
Safety Protections	Anti-reverse, OVP, OCP, OPP, LVP, OTP
Package Dimensions	4.5 x 2.5 x 1.5 inches
Item Weight	3.21 ounces
Country of Origin	China

## 9. WARRANTY AND SUPPORT

UCTRONICS products are designed for reliability and performance. For any technical assistance, troubleshooting, or warranty inquiries, please contact UCTRONICS customer support through their official channels. Please retain your proof of purchase for warranty claims.

For more information and support, visit the official UCTRONICS website or contact their customer service department.