Proster AK3-AT1-GL-M-X

Proster 2000 Count TRMS Digital Clamp Multimeter

Model: AK3-AT1-GL-M-X

1. Introduction

The Proster 2000 Count TRMS Digital Clamp Multimeter is a versatile and reliable instrument designed for accurate measurement of AC current, AC/DC voltage, resistance, capacitance, frequency, and temperature. It also features diode testing, continuity testing, and Non-Contact Voltage (NCV) detection. This manual provides detailed instructions for safe and effective use of the device, ensuring optimal performance and longevity.

2. Safety Information

Always observe safety precautions when using electrical testing equipment. Failure to follow these instructions may result in electric shock, fire, or damage to the meter.

- Read all instructions thoroughly before operating the meter.
- Do not exceed the maximum input values for any function as specified in the specifications section.
- Ensure test leads are properly connected to the correct input jacks before making any measurements.
- Do not use the meter if it appears damaged or if it is operating abnormally. Inspect the meter and test leads for any damage before use.
- Exercise extreme caution when working with voltages above 30V AC RMS, 42V peak, or 60V DC. These voltages pose a significant shock hazard.
- When measuring AC current with the clamp, ensure that only a single conductor is placed within the clamp jaw. If you place two wires (e.g., live and neutral) in the clamp jaw, the reading will be zero as the magnetic fields cancel each other out.
- Avoid using the meter in environments with high humidity, extreme temperatures, or explosive gases.
- Replace batteries promptly when the low battery indicator appears to ensure accurate readings.

3. Product Overview

3.1. Package Contents

The following items are included in your package:

- 1 x Proster Digital Clamp Multimeter
- 1 x K-Type Thermocouple
- 1 x Pair of Test Leads (Red and Black)
- 1 x Pair of Alligator Clips (Red and Black)
- 2 x AAA 1.5V Batteries (pre-installed inside the meter)
- 1 x Cloth Carrying Case
- 1 x User Manual (this document)

Figure 3.1: Proster Clamp Meter and its accessories.

3.2. Device Layout

Familiarize yourself with the main components of the clamp multimeter:

- **Clamp Jaw:** Used for non-contact AC current measurement. Maximum opening of 28mm.
- **Function Rotary Switch:** Selects the desired measurement function (e.g., ACV, DCV, ACA, Resistance, Temperature, NCV).
- **LCD Display Screen:** Shows measurement readings, units, and various indicators (e.g., low battery, data hold, auto-ranging). Features a backlight for improved visibility.

- **Input Jacks:**
    - **COM (Common):** For the black test lead.
    - **VΩHz:** For the red test lead when measuring voltage, resistance, frequency, diode, and continuity.
    - **A:** (Not explicitly labeled as a separate jack for current measurement via leads, as clamp is primary for AC current. This meter uses the clamp for AC current, and VΩHz for other functions.)
- **Buttons:**
    - **MAX/MIN:** Toggles between maximum and minimum recorded values during a measurement session.
    - **RANGE:** Switches between auto-ranging and manual ranging modes.
    - **HOLD/Backlight:** A short press activates/deactivates data hold. A long press activates/deactivates the display backlight.
    - **SELECT:** Cycles through sub-functions on certain rotary switch positions (e.g., Diode/Continuity, °C/°F).

Figure 3.2: Key components of the Proster Clamp Multimeter.

Figure 3.3: Physical dimensions of the Proster Clamp Multimeter.

4. Setup

4.1. Battery Installation

The meter comes with 2 AAA 1.5V batteries pre-installed. If replacement is needed, open the battery compartment cover on the back of the meter and insert new batteries, observing the correct polarity markings. Securely close the cover.

4.2. Connecting Test Leads

For most measurements (voltage, resistance, frequency, diode, continuity, temperature), test leads are required:

- Insert the black test lead into the 'COM' (Common) input jack.
- Insert the red test lead into the 'VΩHz' input jack.

Ensure the connections are firm and secure before proceeding with any measurements.

5. Operating Instructions

Before taking any measurement, ensure the meter is set to the correct function and range. Always start with a higher range if the approximate value is unknown to prevent overload.

5.1. AC Current Measurement (Clamp)

This function measures AC current without breaking the circuit.

1. Turn the rotary switch to the '2A/20A' or '200A/600A' position.
2. Press the trigger to open the clamp jaw.
3. Enclose a single conductor (e.g., a live wire, not a power cord containing multiple wires) through the center of the clamp jaw.
4. Release the trigger to close the jaw securely around the conductor.
5. Read the AC current value directly on the LCD.

5.2. DC/AC Voltage Measurement

Measures the potential difference between two points in a circuit.

1. Turn the rotary switch to 'V~' for AC voltage or 'V=' for DC voltage.
2. Connect the black test lead to the 'COM' jack and the red test lead to the 'VΩHz' jack.
3. Connect the test probes in parallel across the component or circuit to be measured. For DC voltage, ensure correct polarity (red to positive, black to negative).
4. Read the voltage value on the LCD.

Figure 5.1: DC and AC Voltage Measurement.

5.3. Resistance Measurement

Measures the electrical resistance of a component or circuit.

1. Turn the rotary switch to the 'Ω' position.
2. Connect the black test lead to 'COM' and the red test lead to 'VΩHz'.
3. Ensure the circuit or component is de-energized before connecting the test probes across it.
4. Read the resistance value on the LCD.

5.4. Continuity Test

Checks for an unbroken path in a circuit, indicated by an audible tone.

1. Turn the rotary switch to the 'Ω' position.
2. Press the 'SELECT' button repeatedly until the continuity symbol (a speaker icon) appears on the display.
3. Connect the black test lead to 'COM' and the red test lead to 'VΩHz'.
4. Connect the test probes across the circuit or component.
5. If the resistance is below approximately 50Ω, the meter will emit a continuous beep, indicating continuity.

5.5. Diode Test

Tests the functionality of a diode by measuring its forward voltage drop.

1. Turn the rotary switch to the 'Ω' position.
2. Press the 'SELECT' button repeatedly until the diode symbol appears on the display.
3. Connect the black test lead to 'COM' and the red test lead to 'VΩHz'.
4. Connect the red test probe to the anode (+) and the black test probe to the cathode (-) of the diode.
5. Read the forward voltage drop on the LCD. A good silicon diode typically shows a reading between 0.5V and 0.8V. Reversing the leads should show 'OL' (Open Line).

5.6. Frequency Measurement

Measures the frequency of an AC signal.

1. Turn the rotary switch to the 'Hz' position.
2. Connect the black test lead to 'COM' and the red test lead to 'VΩHz'.
3. Connect the test probes across the circuit where frequency is to be measured.
4. Read the frequency value on the LCD.

5.7. Temperature Measurement

Measures temperature using the included K-type thermocouple.

1. Turn the rotary switch to the '°C/°F' position.
2. Connect the K-type thermocouple to the input jacks, ensuring correct polarity (the wider flat pin usually goes into the 'COM' jack, and the narrower pin into 'VΩHz').
3. Place the tip of the thermocouple on or in the object whose temperature is to be measured.
4. Read the temperature value on the LCD. Press the 'SELECT' button to switch between Celsius (°C) and Fahrenheit (°F).

Figure 5.2: Temperature Measurement with Thermocouple.

5.8. Non-Contact Voltage (NCV) Detection

Detects the presence of AC voltage without direct contact, useful for identifying live wires.

1. Turn the rotary switch to the 'NCV' position.
2. Move the top part of the meter (the NCV sensor area) close to the AC voltage source, such as a live wire, power outlet, or electrical appliance.
3. The meter will indicate the presence of AC voltage with an audible alarm and a flashing light, with the intensity of the alarm increasing as the meter gets closer to the voltage source.

Figure 5.3: Non-Contact Voltage (NCV) Detection.

5.9. Special Functions

- **MAX/MIN:** Press this button to display the maximum or minimum measured value recorded during the current measurement session. Press again to cycle through MAX, MIN, and current readings.
- **RANGE:** In auto-ranging modes, the meter automatically selects the appropriate measurement range. Pressing the RANGE button allows you to switch to manual ranging, enabling you to select a specific range. Press again to return to auto-ranging.
- **HOLD/Backlight:** A short press of this button will freeze the current reading on the display (Data Hold). Press again to release. A long press (approx. 2 seconds) will turn the display backlight ON or OFF, improving visibility in low-light conditions.

6. Maintenance

6.1. Cleaning

To clean the meter, wipe the case with a damp cloth and a mild detergent. Do not use abrasives, solvents, or alcohol, as these may damage the casing or internal components.

6.2. Battery Replacement

When the low battery indicator appears on the display, it is time to replace the batteries. Turn off the meter, open the battery compartment on the back, remove the old batteries, and insert two new AAA 1.5V batteries, ensuring correct polarity. Close the battery compartment securely.

6.3. Storage

If the meter is not to be used for an extended period, remove the batteries to prevent leakage and corrosion. Store the meter in its cloth carrying case in a dry, cool, and dust-free environment, away from direct sunlight and extreme temperatures.

7. Troubleshooting

If you encounter issues with your Proster Clamp Multimeter, refer to the following common problems and solutions:

- **No display or meter does not power on:**
  Check if the rotary switch is set to an 'OFF' position. Ensure batteries are correctly installed and have sufficient charge. Replace batteries if necessary.
- **Incorrect or unstable readings:**
  Verify that the correct function and range are selected for the measurement. Ensure test leads are securely connected to the proper input jacks. For AC current, confirm that only a single conductor is within the clamp jaw. Clean test lead tips and input jacks if there is any dirt or corrosion.
- **'OL' or 'OVER' displayed:**
  This indicates an overload or that the measured value is out of the selected range. Switch to a higher range if available, or ensure the input is within the meter's maximum specified limits.
- **No NCV detection:**
  Ensure the rotary switch is set to the 'NCV' position. Make sure the NCV sensor area of the meter is brought sufficiently close to a live AC voltage source.
- **Buzzer does not sound during continuity test:**
  Ensure the continuity function is selected (speaker icon on display). Check if the circuit resistance is below the continuity threshold (approx. 50Ω).

If the problem persists after attempting these solutions, please contact customer support.

8. Specifications

8.1. Basic Functions & Ranges

Function	Range	Accuracy
DC Voltage (DCV)	200mV/2V/20V/200V/600V	±(0.5%+3)
AC Voltage (ACV)	200mV/2V/20V/200V/600V	±(0.8%+5)
AC Current (ACA)	2A/20A/200A/600A	±(2.0%+30)
Resistance	200Ω/2kΩ/20kΩ/200kΩ/2MΩ/20MΩ	±(0.8%+3)
Frequency	100Hz-100MHz	±(0.1%+3)
Temperature	(-40~1000)°C / (0~1832)°F	±(1.0%+5)

8.2. Special Functions

- Diode Test: Yes
- Continuity Test: Yes (Buzzer sounds if resistance < 50Ω±10Ω)
- Low Battery Indication: Yes (Approx. < 2.6V)
- Data Hold: Yes
- NCV (Non-Contact Voltage): Yes
- Auto Power Off: Yes (Approx. 15 minutes of inactivity)
- Function Protection: Yes
- Backlight Display: Yes
- Input Impedance: 10MΩ
- Sampling Rate: 3 times/second
- AC Frequency Response: Current 50-60 Hz / Voltage 50-400 Hz
- Operating Method: Auto Range or Manual Range
- Maximum Display: 2000 Counts
- Clamp Opening: 28mm
- Battery Type: 3V (2 x AAA batteries)

8.3. General Characteristics

- Meter Color: Orange and Black
- Meter Weight: Approx. 200g (including battery)
- Meter Dimensions: 210 × 110 × 45 mm

9. Warranty and Support

Proster products are designed for reliability and performance. For technical support, troubleshooting assistance, or warranty inquiries, please contact Proster customer service through their official channels or the retailer where the product was purchased. Please have your product model number (AK3-AT1-GL-M-X) and purchase information ready when contacting support.

You can also visit the official Proster store on Amazon for more information and support:Proster Amazon Store