MASTECH MS8050

MASTECH MS8050 High-Precision Bench Digital Multimeter User Manual

Model: MS8050 | Brand: MASTECH

1. Introduction

The MASTECH MS8050 is a high-accuracy, high-stability digital multimeter designed for precise measurements in various applications. It features a 24-bit A/D converter and a direct digit display up to 53000 counts. This instrument supports DC, AC RMS, and mixed signal DC+AC RMS voltage measurements up to 1000V, and current measurements up to 10A. With a 1 microvolt DC and 20KHz AC frequency resolution, it meets diverse measurement requirements. It also functions as a frequency meter, capable of measuring pulses over 2MHz and linear frequencies up to 200KHz, including current frequency. The MS8050 offers measurements for large resistors up to 50MΩ, capacitors up to 5000μF, and includes functions for maximum, minimum, relative, average values, decibel measurements, diode tests, and continuity checks. Its color fluorescent digital display and 30-full storage function enhance usability. The device includes an RS-232C interface with PC software for data display, recording, and dynamic mapping, transforming it into a versatile measuring recorder. Misoperation protection ensures safety.

This image displays the MASTECH MS8050 Bench Digital Multimeter from a slightly elevated front-right angle, showcasing its green casing, large digital display, function buttons, and input terminals.

2. Key Features

- 53000 counts measurement. Auto/Manual range. ACV and ACV measurements reach up to 1000V. DC measurement accuracy reaches up to 0.03%.
- 0.1Ω resistance and 1μV voltage resolution. Voltage/Current linear frequency measurement. Logic frequency/duty cycle measurement.
- Capacitance measurement from 0.01nF to 5000μF. AC/AC + DC true RMS/dBm measurement. MAX/MIN/MAX-MIN value, relative value, average value measurement.
- Data hold function. RS-232C interface and PC Windows software for data logging and analysis. Software calibrates automatically. Full overload protection.
- Color fluorescent double display. Full screen memory function. Insulating performance reaching 1000V CATII.

3. Setup

Before operating the MASTECH MS8050, ensure proper setup to guarantee accurate measurements and user safety.

3.1 Unpacking and Inspection

- Carefully remove the multimeter from its packaging.
- Inspect the device for any signs of physical damage. If damage is found, do not use the device and contact customer support.
- Verify that all accessories, including test leads, power cord, and RS-232C cable, are present.

3.2 Power Connection

1. Ensure the multimeter's power switch is in the OFF position.
2. Connect the provided power cord to the power input socket on the rear of the multimeter.
3. Plug the other end of the power cord into a suitable AC power outlet.

3.3 Connecting Test Leads

1. For most voltage, resistance, and continuity measurements, insert the red test lead into the**VΩ** input terminal and the black test lead into the **COM** (common) input terminal.
2. For current measurements, insert the red test lead into the**mA** or **10A** input terminal, depending on the expected current range, and the black test lead into the **COM** terminal.
3. Always ensure test leads are securely connected before taking measurements.

A direct front view of the MASTECH MS8050 Bench Digital Multimeter, highlighting the display, control panel, and input jacks. The integrated stand is visible at the bottom.

4. Operating Instructions

This section details the operation of the MASTECH MS8050 for various measurement functions.

4.1 Powering On/Off

- To power on the device, press the green power button located on the front panel.
- To power off, press the power button again.

4.2 Function Selection

Use the function buttons on the front panel to select the desired measurement mode:

- **V⎓**: DC Voltage measurement.
- **V~**: AC Voltage measurement.
- **A⎓**: DC Current measurement.
- **A~**: AC Current measurement.
- **Ω**: Resistance measurement.
- **CAP**: Capacitance measurement.
- **Hz**: Frequency measurement.
- **DIODE**: Diode test.
- **CONT**: Continuity test.

4.3 Range Selection

The MS8050 supports both auto-ranging and manual ranging. Press the**RANGE** button to switch between auto and manual modes. In manual mode, repeatedly press **RANGE** to cycle through available ranges for the selected function.

4.4 Special Functions

- **MAX/MIN**: Press this button to record and display the maximum and minimum values measured during a session.
- **REL (Relative)**: Press to set the current reading as a reference value, and subsequent measurements will be displayed as a deviation from this reference.
- **AVG (Average)**: Calculates and displays the average of measurements over time.
- **HOLD**: Freezes the current display reading. Press again to release.
- **dBm**: Measures decibels relative to 1 milliwatt.
- **True RMS**: The multimeter automatically performs True RMS measurements for AC voltage and current, providing accurate readings for non-sinusoidal waveforms.

4.5 PC Software and RS-232C Interface

The MS8050 includes an RS-232C interface for connection to a personal computer. Use the provided RS-232C cable and Windows software to:

- Display real-time measurement data on the computer screen.
- Record and log measurement data over time.
- Generate graphs and charts of measurement trends.
- Perform automatic calibration of the instrument via software.

Refer to the software's dedicated manual for detailed installation and operation instructions.

5. Maintenance

Proper maintenance ensures the longevity and accuracy of your MASTECH MS8050 multimeter.

5.1 Cleaning

- Always disconnect the power cord and test leads before cleaning.
- Wipe the exterior of the multimeter with a soft, damp cloth. Do not use abrasive cleaners or solvents.
- Ensure no moisture enters the device through the input terminals or ventilation openings.

5.2 Calibration

The MS8050 features software-based automatic calibration. Regular calibration, as recommended by MASTECH, helps maintain the instrument's high accuracy. Refer to the PC software manual for calibration procedures.

5.3 Storage

- Store the multimeter in a cool, dry place, away from direct sunlight and extreme temperatures.
- Keep the device free from dust and moisture.
- If storing for extended periods, ensure the device is powered off and disconnected from all power

sources.

6. Troubleshooting

This section provides solutions to common issues you might encounter with the MS8050 multimeter.

6.1 No Display or Power

- Check if the power cord is securely connected to both the multimeter and the AC outlet.
- Verify that the AC outlet is functional by plugging in another device.
- Ensure the power switch on the multimeter is in the ON position.

6.2 Incorrect or Unstable Readings

- Ensure test leads are correctly inserted into the appropriate input terminals for the selected function.
- Check for loose or damaged test leads. Replace if necessary.
- Verify that the correct measurement function and range are selected for the circuit being tested.
- Ensure good contact between the test probes and the circuit points.
- Environmental factors like strong electromagnetic interference can affect readings. Move the multimeter away from such sources.

6.3 PC Software Connection Issues

- Ensure the RS-232C cable is securely connected to both the multimeter and the computer.
- Verify that the correct COM port is selected in the PC software settings.
- Check if the necessary drivers for the RS-232C interface are installed on your computer.
- Restart both the multimeter and the computer, then try connecting again.

7. Specifications

Detailed technical specifications for the MASTECH MS8050 Bench Digital Multimeter:

Specification	Value
Brand	MASTECH
Model	MS8050
Measurement Type	Multimeter
Display Counts	53000
DC Voltage Accuracy	0.03%
Max Voltage Measurement	1000V (DC/AC RMS)
Max Current Measurement	10A
Resistance Resolution	0.1Ω

Specification	Value
Voltage Resolution	1µV
Capacitance Measurement Range	0.01nF to 5000µF
Frequency Measurement Range	Pulse >2MHz, Linear 200KHz
Interface	RS-232C
Power Source	Manual (AC Power)
Style	Digital
Min. Operating Voltage	1 Microvolts
UPC	760970480348
Manufacturer	China
Item Package Quantity	1
Batteries Included?	No
Batteries Required?	No
Date First Available	January 25, 2018

8. Safety Information

Always observe the following safety precautions when operating the MASTECH MS8050 multimeter to prevent personal injury or damage to the instrument:

- Do not exceed the maximum input limits for any function.
- Never apply voltage to the current input terminals (mA, 10A) when the function switch is set to a current range.
- Ensure the multimeter is in good working condition and that test leads are not damaged before use.
- Do not operate the multimeter in wet environments or with wet hands.
- Be cautious when working with voltages above 30V AC RMS, 42V peak, or 60V DC, as these pose a shock hazard.
- Always disconnect power to the circuit under test before connecting or disconnecting test leads for current measurements.
- Use the correct terminals, function, and range for your measurements.
- Refer to the CAT rating of the instrument (1000V CATII) and ensure it is suitable for your application.

9. Limited Warranty

MASTECH products are manufactured to high-quality standards. This product is covered by a limited warranty against defects in materials and workmanship. The specific terms and duration of the warranty may vary by region and retailer. Please retain your proof of purchase for warranty claims. For detailed warranty information, refer to the documentation included with your purchase or contact MASTECH customer support.

10. Customer Support

For technical assistance, troubleshooting, or inquiries regarding your MASTECH MS8050 multimeter, please contact MASTECH customer support. Contact information can typically be found on the MASTECH official website or in the product packaging. When contacting support, please have your product model number (MS8050) and purchase details ready.