

## Velleman EDU09

# Velleman EDU09 PC Oscilloscope Educational Kit User Manual

Model: EDU09

## 1. INTRODUCTION

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The Velleman EDU09 is an educational PC oscilloscope kit designed for users to assemble and utilize a personal computer for displaying measurements. This kit provides the core functionalities of a full-featured oscilloscope, spectrum analyzer, and transient recorder. It is intended for educational purposes and for individuals interested in building their own electronic test equipment.

**Note: This is an electronic kit and requires assembly. Detailed instructions and test leads are included with the kit for the assembly process.**

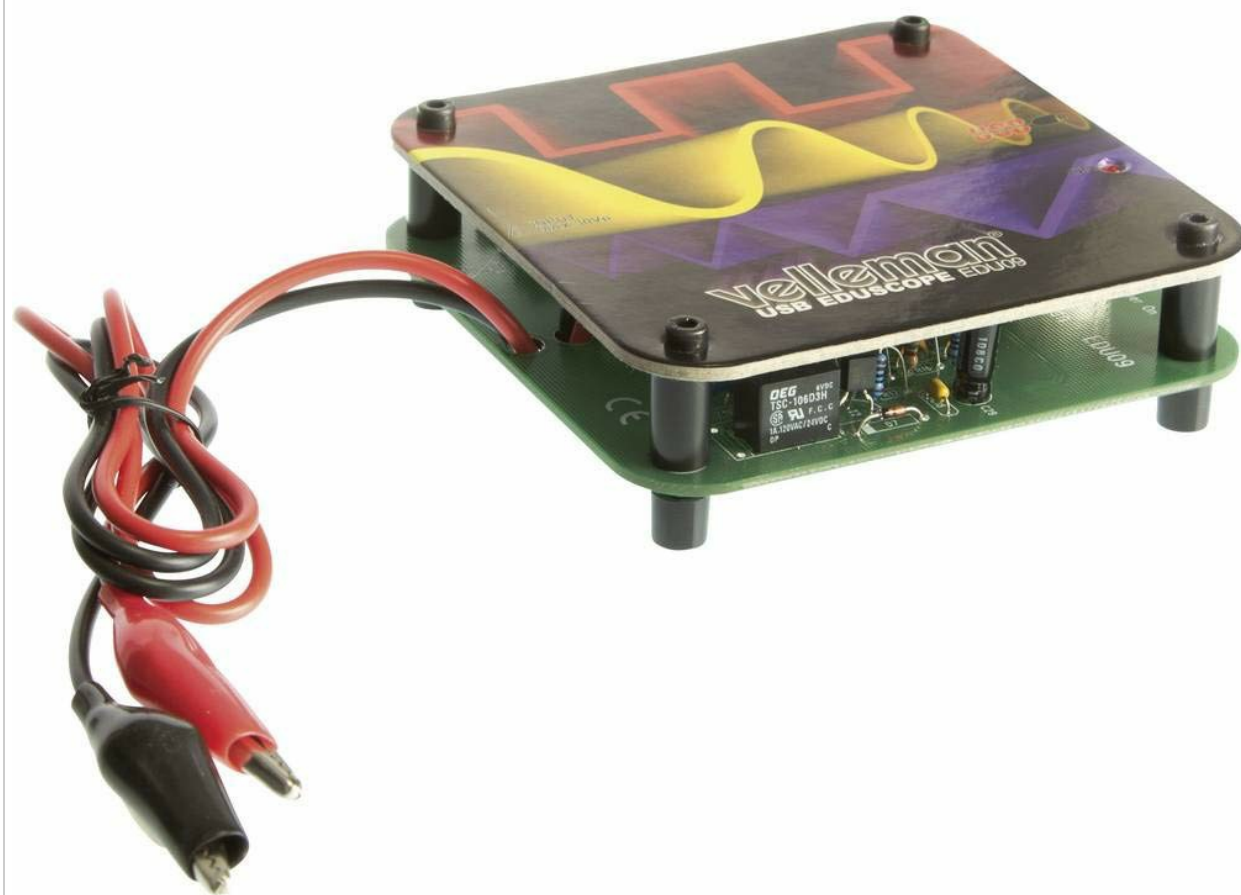
## 2. ASSEMBLY INSTRUCTIONS

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The Velleman EDU09 is supplied as a complete electronic kit. Successful assembly requires basic soldering skills and familiarity with electronic components. Please refer to the dedicated assembly manual included in your kit for step-by-step instructions, component identification, and safety guidelines.



**Figure 1:** The assembled Velleman EDU09 PC Oscilloscope Kit, showing the main unit connected to red and black test leads with alligator clips.



**Figure 2:** A side view of the Velleman EDU09 kit, illustrating the transparent top cover, the main circuit board with various electronic components, and the stand-offs.



**Figure 3:** An angled view of the Velleman EDU09 kit, showcasing the USB port on the side for PC connection and the internal circuit board components.

### 3. SYSTEM SETUP

To prepare your Velleman EDU09 for operation, follow these steps:

1. **Connect to PC:** Connect the assembled EDU09 unit to your computer using a standard USB cable. The device is powered directly through the USB connection.
2. **Driver Installation:** The EDU09 utilizes the Microsoft Human Interface Device (HID) driver, which is typically pre-installed on compatible Windows operating systems. No external driver installation is usually required.
3. **Software Installation:** Download the latest control software for the Velleman EDU09 from the official Velleman website. Follow the on-screen instructions to install the software on your computer.
4. **System Requirements:** Ensure your PC meets the following minimum specifications:
  - Operating System: Windows XP, Vista, 7, 8
  - Display: SVGA display card (minimum 1024 x 768 resolution)
  - USB Port: Free USB 1.1 or 2.0 port

- Power Supply: USB provides +/- 200 mA

## 4. OPERATING INSTRUCTIONS

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The Velleman EDU09 software provides an interface for controlling the device and displaying measurements. The software offers both expert and basic mode selections to suit different user experience levels.

### 4.1. Oscilloscope Functionality

The oscilloscope mode allows for real-time waveform visualization and analysis.

- **Input Coupling:** Select between DC and AC input coupling based on your measurement requirements.
- **Markers:** Utilize amplitude/voltage and frequency/time markers for precise measurements.
- **Readouts:** The software provides various readouts including True RMS, dBV, dBm, peak-to-peak (p to p), Duty cycle, and Frequency.
- **Data Storage:** The software supports storage of both display images and measurement data for later analysis.

### 4.2. Spectrum Analyzer Functionality

The spectrum analyzer mode allows for frequency domain analysis of signals.

- **Operating Principle:** Employs Fast Fourier Transform (FFT) for spectral analysis.
- **FFT Resolution:** Provides a resolution of 512 lines for detailed frequency analysis.

### 4.3. Transient Recorder Functionality

The transient recorder mode is designed for capturing and logging slow-changing signals over extended periods.

- **Automatic Storage:** Features automatic storage of data.
- **Record and Display:** Allows for recording and displaying multiple screens of data.
- **Extended Recording:** Capable of automatic recording for periods exceeding one year.

## 5. TECHNICAL SPECIFICATIONS

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### 5.1. General Information

- Resolution: 8 bit
- Power Supply: Through USB (+/- 200 mA)
- Driver: Microsoft Human Interface Device (HID), no external driver required
- Operating System Compatibility: Windows XP, Vista, 7, 8
- Display Requirement: SVGA display card (min. 1024 x 768)
- USB Port Requirement: Free USB 1.1 or 2.0 port

### 5.2. Oscilloscope Specifications

- Bandwidth: DC to 200 kHz  $\pm$  3 dB
- Input Impedance: 100 kohm / 20 pF
- Maximum Input Voltage: 30 V (AC + DC)
- Time Base: 10  $\mu$ s to 500 ms per division
- Sampling Frequency: 62.5 Hz to 1.5 MHz

- Record Length: 1k samples

### 5.3. Spectrum Analyzer Specifications

- Frequency Range: 0 .. 150 Hz to 75 kHz
- Operating Principle: FFT (Fast Fourier Transform)
- FFT Resolution: 512 lines

### 5.4. Transient Recorder Specifications

- Timescale: 20 ms/div to 2000 s/div
- Maximum Recording Time: 9.4 hours per screen

### 5.5. Physical Dimensions

- Product Dimensions (L x W x H): 0.98 x 4.76 x 7.87 inches
- Item Weight: 0.2 Kilograms (7.05 ounces)

## 6. MAINTENANCE

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To ensure the longevity and proper functioning of your Velleman EDU09 kit, observe the following maintenance guidelines:

- **Cleaning:** Gently wipe the exterior of the device with a soft, dry cloth. Avoid using abrasive cleaners, solvents, or excessive moisture, which can damage electronic components.
- **Storage:** Store the device in a cool, dry environment, away from direct sunlight, extreme temperatures, and high humidity.
- **Handling:** Handle the assembled kit with care to prevent damage to the circuit board or connections. Avoid dropping or subjecting it to strong impacts.
- **Component Integrity:** Periodically inspect soldered joints and components for any signs of damage or loose connections, especially after extended use or if performance issues arise.

## 7. TROUBLESHOOTING

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If you encounter issues with your Velleman EDU09, consider the following troubleshooting steps:

- **Device Not Recognized:**
  - Ensure the USB cable is securely connected to both the EDU09 and your PC.
  - Try connecting to a different USB port on your computer.
  - Verify that your PC meets the minimum system requirements, particularly the operating system and USB port version.
  - Check Device Manager in Windows to see if the device is listed without errors.
- **No Signal or Incorrect Readings:**
  - Confirm that the test leads are properly connected to the signal source and the EDU09 input.
  - Check the input coupling (AC/DC) setting in the software to ensure it matches your signal type.
  - Verify that the signal source is active and within the maximum input voltage limits of the EDU09 (30 V AC+DC).
  - Review your assembly for any soldering errors or incorrectly placed components.

- **Software Issues:**

- Ensure you have the latest version of the Velleman EDU09 software installed from the official website.
- Restart the software and/or your computer.
- If issues persist, try reinstalling the software.

## **8. WARRANTY AND SUPPORT**

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Specific warranty information for the Velleman EDU09 PC Oscilloscope Educational Kit is not provided within this manual. For details regarding warranty coverage, technical support, or service, please refer to the documentation included with your purchase or visit the official Velleman website. Contact information for customer support can typically be found on the manufacturer's website.