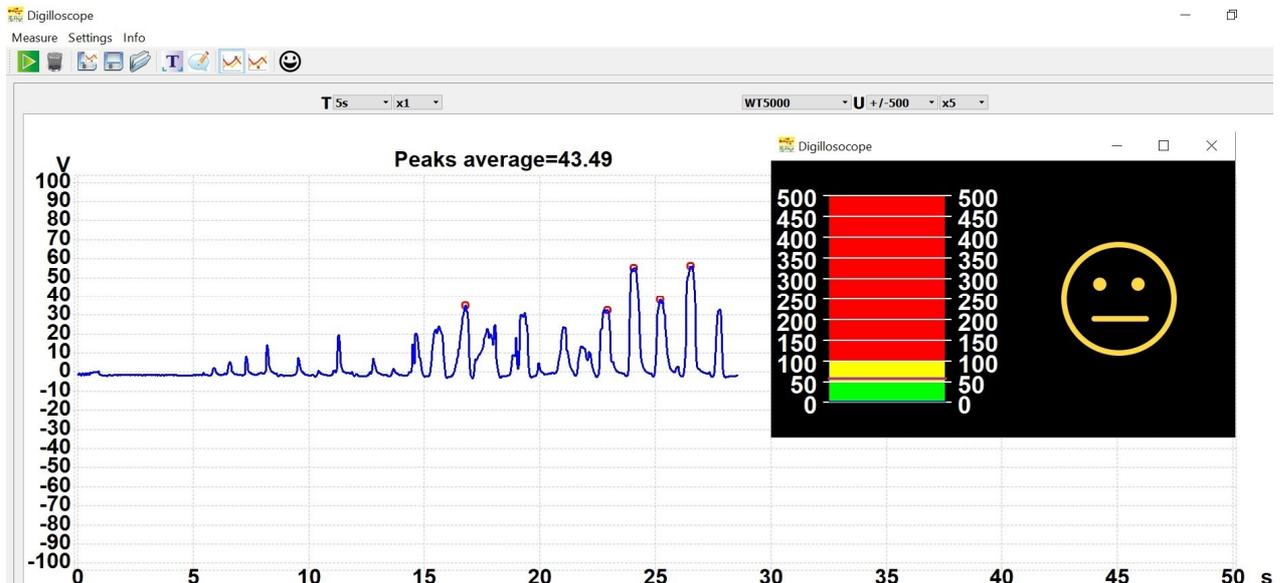
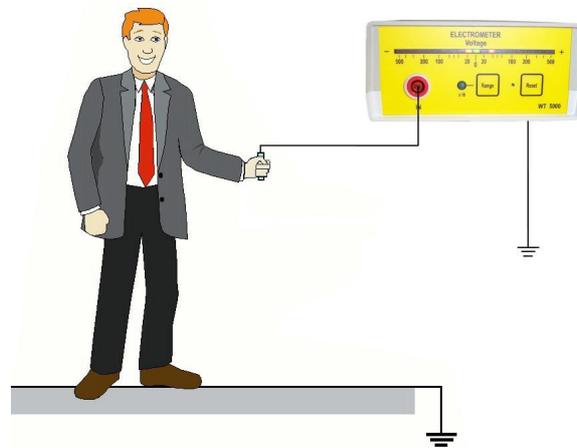


# User's Manual

## Walking Test Kit

### 7100.WT5000.B

#### USB-Version 2



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## Overview

The Walking Test Kit described below, is used to monitor the body voltage on a person. The voltage is taken from the electrometer through the A/D-converter and displayed on a PC or a laptop.

### The kit consists of:

- Electrometer WT5000
- A/D-Converter
- Data acquisition and analysis software
- Handheld probe
- Connecting cable and plugs
- Conductive carrying case

## Technical data

### Electrometer

Dimensions:	190 x 148 x 67 mm (L x W x H)
Weight:	ca. 500g
Input voltage:	$\pm 500V / \pm 5000V$
Input impedance:	$> 10^{14} \Omega$
Input capacity:	$< 5 \text{ pF}$
Response time:	$\leq 10 \text{ ms}$
Output:	Analog $\pm 5V$
Display:	21-digit logarithmic LED display with "Peak Hold"
Power supply:	4 pcs. NiMH rechargeable batteries (AA)
Operating time:	4 to 6 hours
Charger:	7,5V DC, 300 mA
Ranges:	$\pm 500V, \pm 5000V$
Accuracy:	$< 5\%$ of full scale
Battery monitoring:	audible

### A/D-Converter

Input impedance:	10 M $\Omega$
Interface:	USB 2.0 / USB 1.1
Input voltage:	$\pm 5V$
Resolution:	12 Bit
Max. sampling rate:	10 kHz
Power supply:	via USB port

## Operation

### ■ Controls and displays



#### Front side

- (1) Measurement input
- (2) Input range indicator LED x10
- (3) Input range selector
- (4) Trimmer for zero adjustment
- (5) "Peak Hold" reset button
- (6) 21-digit logarithmic LED display

#### Back side

- (7) On-/off button
- (8) Power supply socket for the charger
- (9) Grounding socket
- (10) Analog output (BNC socket) - Analog signal for the A/D-converter

## ■ Function keys

- On/Off (7)** On/Off switch.  
 A beep signal sounds on power on.  
 When not in use, the instrument switches off automatically after 15 minutes.
- Range (3)** Selects input range  $\pm 500\text{V}$  or  $\pm 5000\text{V}$ . The higher range is indicated by the green "x10" LED
- Reset (5)** Resets the "Peak Hold" display

## ■ "Peak Hold" function

The last measured positive and negative peak value is held on the LED display until it is reset with the "Reset" button.

## ■ Measuring range

The two measuring ranges can be switched with the "Range" button.  
 When switched on, the instrument's range is  $\pm 500\text{V}$ . Pressing the "Range" button will switch the instrument to  $\pm 5000\text{V}$ . This range is displayed by the green x10 LED.

**Changing the range will also change the output resolution of the analog output. This has to be taken into account during measurement.**

<i>Range</i>	<i>Output</i>	<i>Multiplier</i>
$\pm 500\text{V}$	$\pm 5\text{V}$	100
$\pm 5000\text{V}$	$\pm 5\text{V}$	1000

# Maintenance

## ■ Battery charging and replacement

An audible signal indicates a battery low state. Plug in the power supply to charge the battery when necessary. The battery is located inside the battery compartment underneath the instrument.

**Only NiMH rechargeable batteries Type (AA) are allowed for this instrument!**

## ■ Zero adjust

Zero adjusting is normally not necessary. If the unit does not indicate 0V while the input is connected to ground, the zero-adjustment trimmer (4) can be used for the adjustment.

## ■ Warranty

Warranty does not include the NiMH rechargeable battery, battery damage due to drain and mechanical damage of the instrument.

The warranty is void if the unit is opened.

## Notice

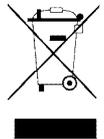
- **This instrument is not approved for measurements in explosion hazard areas.**
- The electrometer must always be grounded during measurement.
- Using the instrument in power plants is not permitted.
- The electrometer is not equipped to detect alternating fields > 100 Hz.

## Calibration

The recommended calibration interval is 2 years.

## Waste Disposal

The instrument is a category 9 product (monitoring and control instrument) in accordance with ElektroG (German and Electronic Device Law). This device is not subject to the RoHS directive. We identify our electrical and electronic devices in accordance with WEEE 2002/96/EG and ElektroG with the symbol shown to the right per DIN EN 50419. These devices may not be disposed of with the trash.



If you use batteries or rechargeable batteries in your instrument or accessories which no longer function properly, they must be duly disposed of in compliance with the applicable national regulations. Batteries or rechargeable batteries may contain harmful substances or heavy metal such as lead (PB), cadmium (CD) or mercury (Hg).

The symbol shown to the right indicates that batteries or rechargeable batteries may not be disposed of with the trash, but must be delivered to collection points specially provided for this purpose.

## Preparation

For data acquisition and storage, the Digilloscope software must be installed on a Computer with Windows operating system and the A/D-converter must be connected to a USB port.

### ■ Connecting the components

1. Insert the USB plug into the computer's USB socket  
(After successful software installation).
2. Connect the BNC-cable with the electrometer.
3. Connect the earth terminal of the electrometer to earth using the crocodile clip of the grounding cord.
4. Connect the handheld probe to the electrometer using the measuring cable.
5. Charge the battery of the electrometer with the external power supply if required.

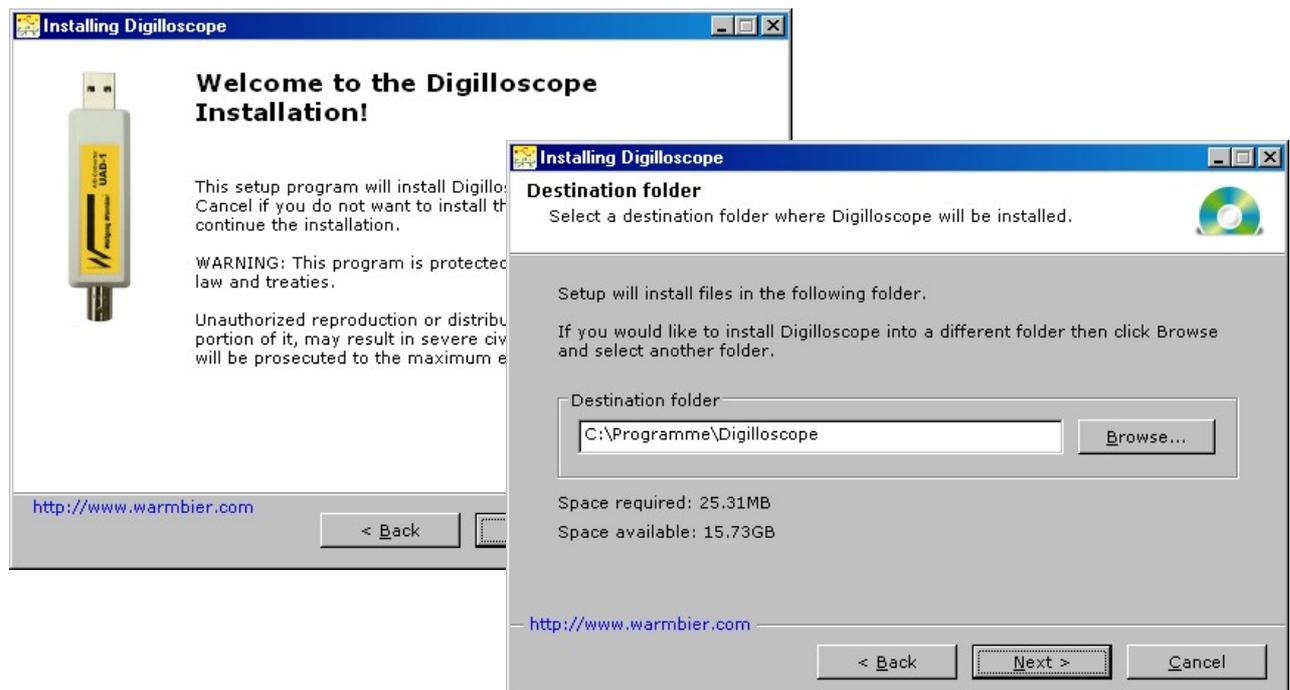


#### Note:

The electrometer must be connected to the computer during the whole measurement.

### ■ Software installation

- Disconnect the USB plug from the computer
- Run the installation program *setup.exe* on the enclosed CD-ROM. You must have administration right to do so
- Connect the USB plug
- Confirm the hardware assistant's automatic driver installation



## ■ Operation

- The software is preset to be operated with the WT5000 Electrometer
- Additional settings can be loaded via **Settings** menu

	Start and stop measurement		
	Clear the measurement		
	Save chart to graphic file		
	Save measurement		Load measurement
	Enter the title		Enter the comment
	Calculate average peaks [F1]		Calculate average valleys [F2]

<b>Measure</b>	
Start	Start and stop measurement
Clear	Clear the measurement
Calculate average peaks	Calculate the 5 highest peaks
Calculate average valleys	Calculate the 5 highest valleys
Title	Enter the title
Comment	Enter the comment
Save snapshot	Save chart to graphic file
Save	Save measurement data (max. 200 sec.) and settings
Load	Load measurement data and settings

<b>Settings</b>	
Remove X markers	Clears all X cursors
Remove Y markers	Clears all Y cursors
Set Y1 indicator	Set cursor Y1 to a preset value
Set Y2 indicator	Set cursor Y2 to a preset value
Grid width	Select the line width for the grid
Grid color	Select the grid color
Background color	Select the background color
Line width	Enter the line width
Line color	Select the line color
Font size	Select font size
Comment font size	Select the font size for comments
Comment	Enter a comment for the current measurement
Save settings	Save ranges and scaling
Load settings	Restore saved settings
Language	Change program language
Levels	Adjust scaling and ranges

## ■ Display adjustment

The graph can be adjusted on the screen with the mouse by pressing the left mouse button. Zoom the time axis with scaling selector **T (X1-X20)** or scrolling the mouse wheel while holding **Key X**. Y-axis can be changed with scaling selector **U (X1-X20)** or scrolling the mouse wheel while holding **Key Y**.

## ■ Cursor positioning

### Horizontal Cursor:

Create: Double-click to X-axis (Time).  
Move: Cursor X1: Press and hold STRG-key while positioning the mouse  
Cursor X2: Press and hold ALT-key while positioning the mouse

### Vertical Cursor:

Create: Double-click to Y-axis (Voltage).  
Move: Cursor Y1: Press and hold SHIFT+STRG-key while positioning the mouse  
Cursor Y2: Press and hold SHIFT+ALT-key while positioning the mouse

**A measuring chart must be displayed to set the cursors!**

## ■ Calculation

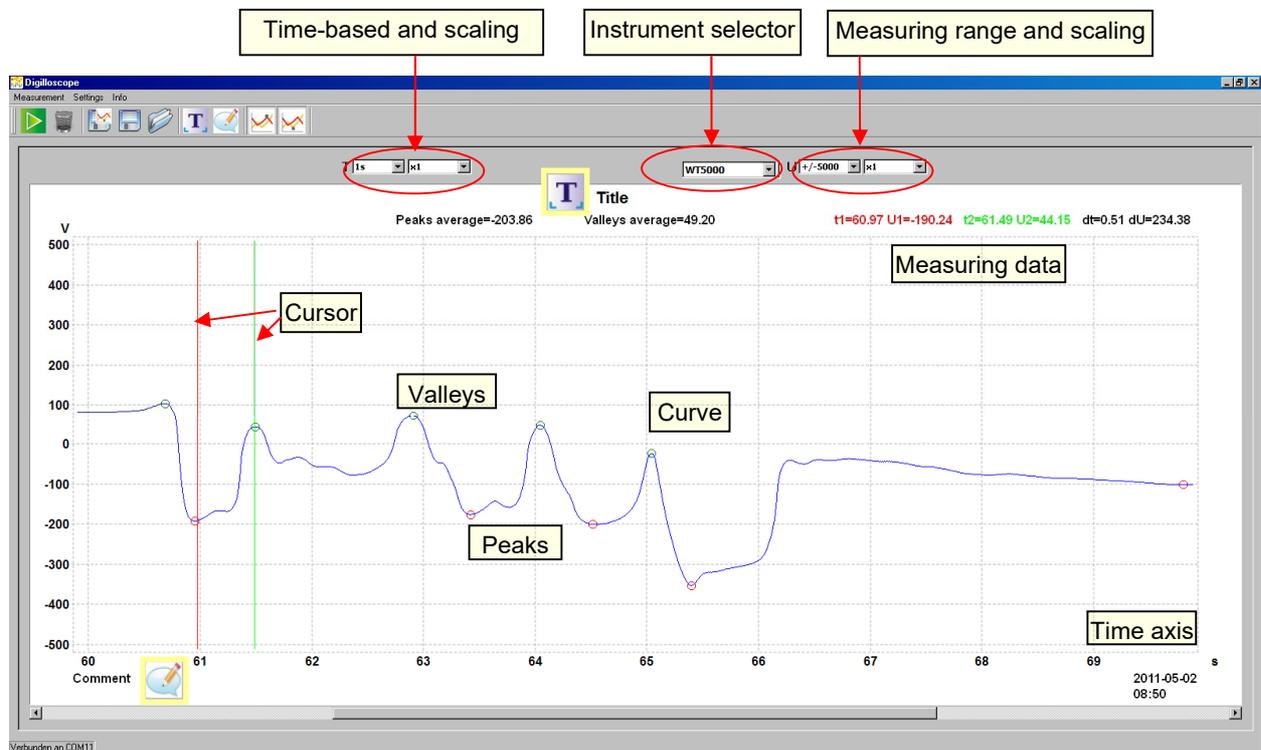
The function "calculate peaks calculate valleys" can be used to calculate the 5 highest peaks or 5 highest valleys according to IEC 61340-4-5

The program tries to determine the measuring points within the displayed area automatically. Therefore, it is necessary to have the entire graph visible.

The five detected **peaks** are marked in **red**. Press **key N** and click onto a measuring point to delete or set a calculation point. Valleys are marked in **green** and can be modified with **key M** accordingly.

## ■ Measuring

- Select instrument **WT5000**
- Set the **X-Scaling** to **1s/Unit**
- Set the **Y-Scaling** to either **± 5000V** or **± 500V** appropriate to the setting of the Electrometer.
- Start measurement with the green start-button in the upper left corner of the window
- Perform the Walking Test and stop measurement afterwards with the same button. The measurement data is rolling continuously on the screen during measurement
- Set the cursors as shown in the picture to measure the curve
- Calculate peaks and valleys with function key **F1** and **F2**
- Apply a title if desired with **Settings - Title**
- If desired enter additional text with **Settings - Comment**
- Store the last 200 seconds of the measurement with **Measurement - Save**.
- **Measurement - Save snapshot** saves the current screen to graphic file



### Adjust Y-scaling

Range U= ± 500V



Function "x10" **not** active

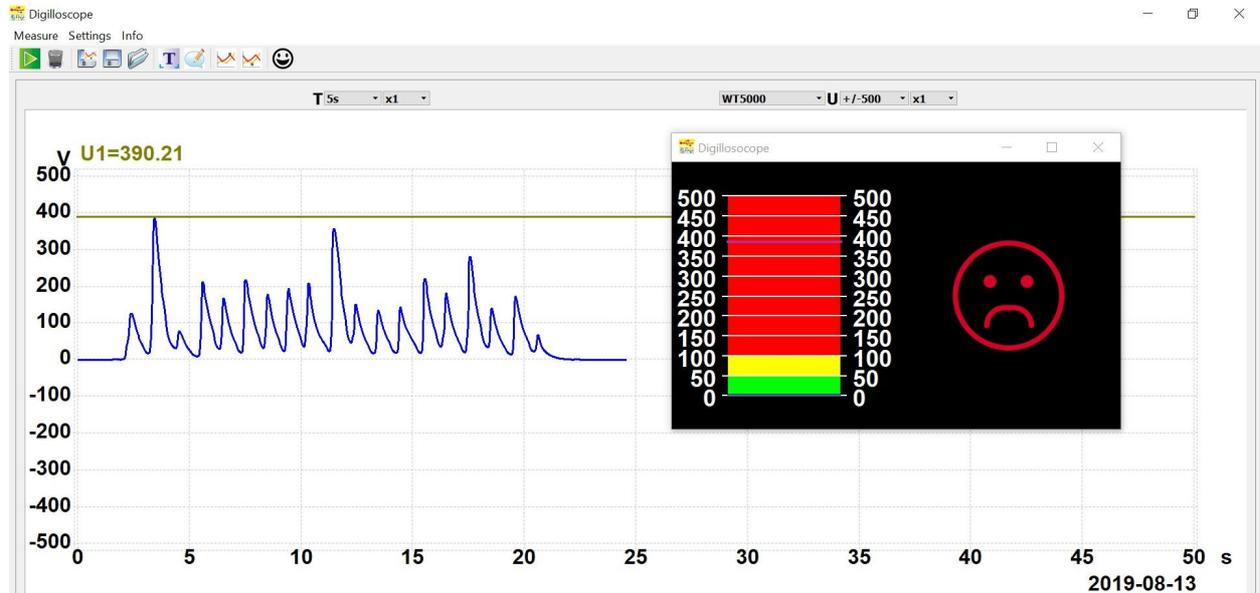
Range U= ± 5000V



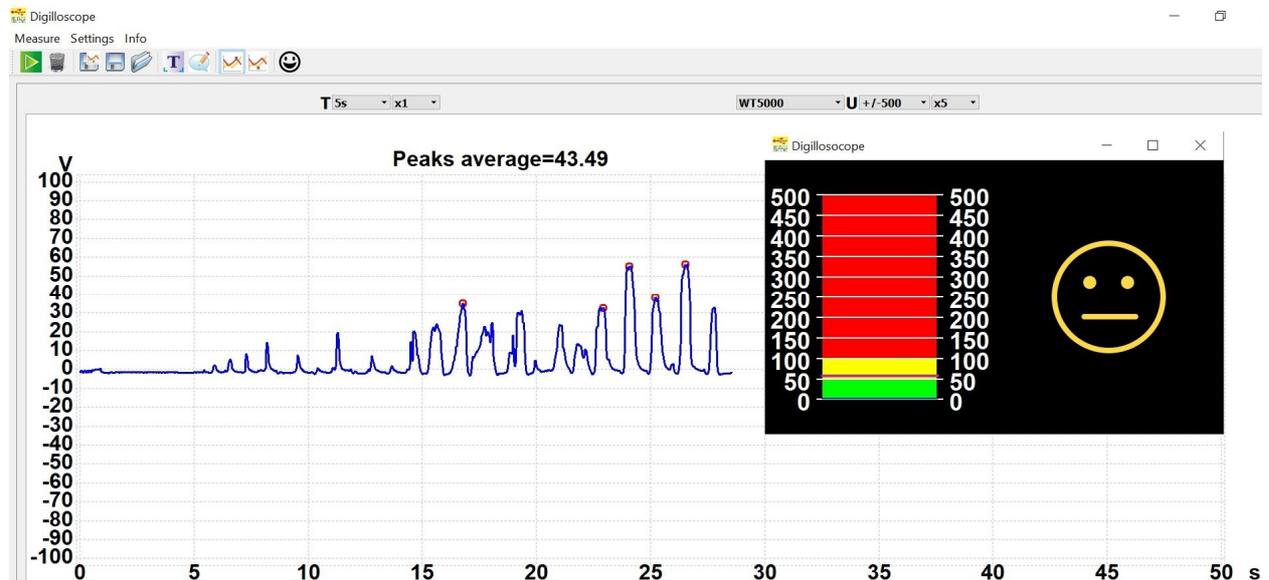
Function "x10" **must** be active

## Emoji function

The Digilloscope version V1.1.07 has an implemented “Emoji display” which can be activated when performing a walking test.



Example 01: Peak value during a walking test exceeds the maximum allowed level of 100 V



Example 02: Peak value during walking test is in the range 50 to 100 V.