User's Manual

Surface Resistance Meter
SRM®200

Firmware 2.x

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Wolfgang Warmbier®
Systeme gegen Elektrostatik

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Introduction

The SRM®200 is a pocket size, lightweight, auto ranging surface resistance tester.
Measured values are displayed on an LCD dot matrix module and can be stored in the internal memory.
Each measurement includes the current temperature and relative humidity.
Built-in electrodes with conductive rubber make good contact with the object under test.
IEC compatible electrodes can be externally connected for tests according to **IEC 61340-4-1**, **IEC 61340-2-3** and **IEC 61340-4-5.**

Operating Instructions

■ Operation Description

1. Socket for external probes
2. LCD-Display
3. Range LED's

LED	Measuring range	Definition
Green	$< 1 \times 10^4 \; \Omega$	Electrostatic conductive
Yellow	$\geq 1 \times 10^4 \; \Omega$ - $9 \times 10^{10} \; \Omega$	Electrostatic dissipative
Red	$\geq 1 \times 10^{11} \; \Omega$	Electrostatic insulating

4. Buttons Up / Down / MENU / OK

Button	Function
MENU	- Open menu - Return from sub-menu
OK	- Confirm or change value
▼	- Increase value - Scroll down in menu
▲	- Decrease value - Scroll up in menu

Simultaneously pressing ▲ ▼ turns the instrument off.

5. "Push to test" button to switch ON and start measurement
6. USB connector for battery charger and PC connection
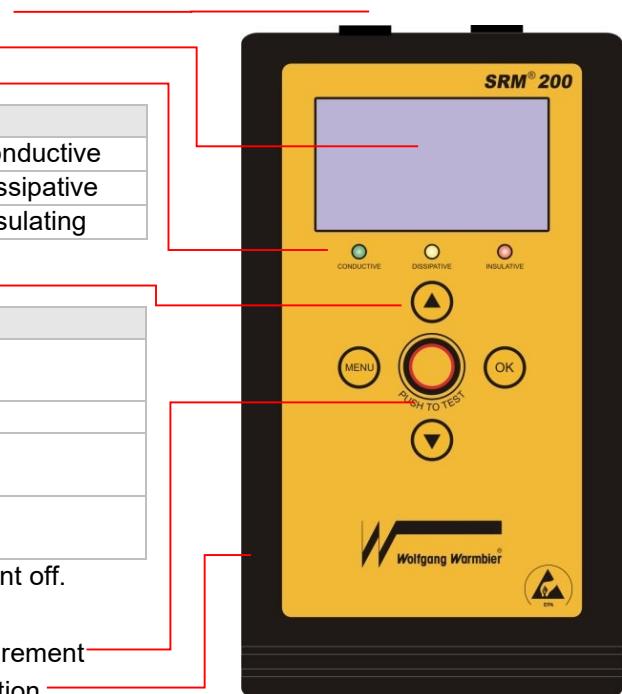
Menu structure overview

View results	Display measurement results
Delete results	Delete measurement data
Delete all data	Delete all measurement data
Limit	Display or change limit values (max. 19)
Folder name	Display or change folder names (max. 99) _Folder names can be entered more convenient by using the PC software_
Timeout	Turn-off delay time
Temperature	Change temperature between °C and °F
Date	Adjust date and time
Calibration	Display calibration date and software version
Language	Language selection German / English

LCD display overview

Measured value

(**V**) View result mode active
(**D**) Delete mode active

Value is below
selected limit

Temperature

Assigned limit

Value exceeds
selected limit

Relative humidity

$> 6 * 10^9$ Ohm

$22°C ◄ LIMIT01 ► 52\%$

05   01/10/09 11:09

Storage folder   Date   Time   Battery status
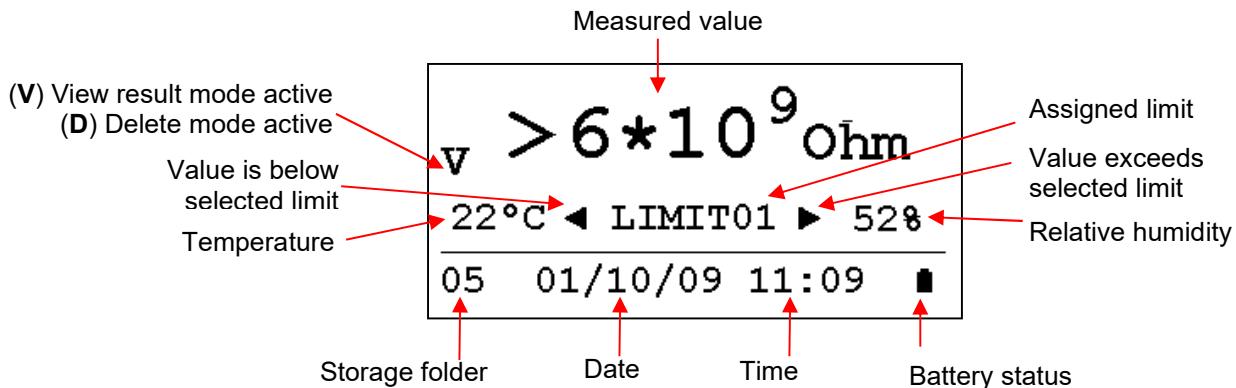
■ Measuring Surface Resistance

- To measure the surface resistance of an object, hold the instrument onto the surface and press the "PUSH TO TEST" button.
- The value is indicated on the display. The coloured LED's additionally indicate the measuring range if no limit is assigned. If the limit is assigned, the limit arrows on the display will indicate the measured value being below or above the limit range.
- ▼▲ selects the storage folder; **OK** stores the current measurement value to the selected folder.


PUSH TO TEST
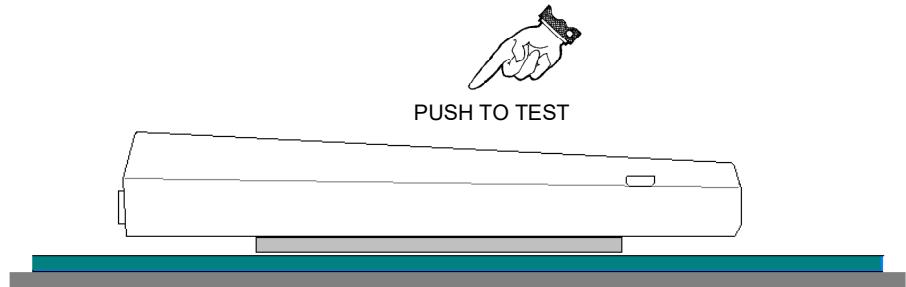
■ Measuring Resistance to Ground

- Plug in the supplied grounding cord at one socket of the instrument. The associated internal electrode will be disconnected.
- Connect the opposite end of the grounding cord to "ground" or a "groundable point".
- Hold the instrument onto the surface like described above and press the button.

PUSH TO TEST

Wolfgang Warmbier ®
Systeme gegen Elektrostatik
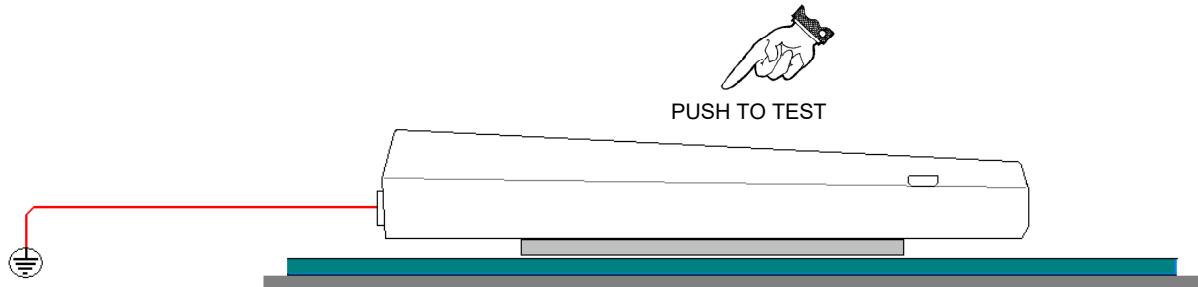
■ Other Measurements

By connecting external electrodes to the instrument's sockets it is possible to measure "point to point resistance", or "volume resistance" for example.

Volume resistance R_V

Metal counter electrode

Probe model 850

Probe model 850

Surface resistance R_{PP}
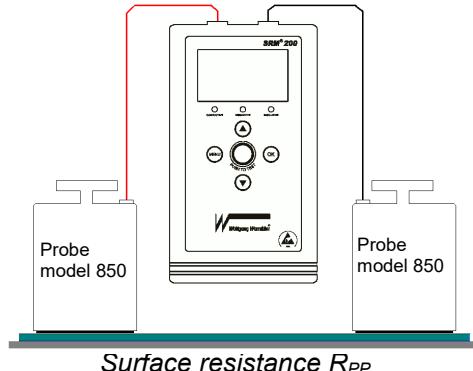
Test values Storage

The included software can be used to transfer and process test values to the computer.
The functionality includes:

- ➢ Measurement data transfer
- ➢ Store and export measurement data
- ➢ Print measurement report

- ➢ Limit value definition
- ➢ Labelling of measurement folders
- ➢ Adjust Date and time

Functions

The following functions are available. Most of them can be accessed more conveniently by the PC software.

■ View results

MENU - press button
View results - select
OK - confirm
▼▲ - select folder (1-99)
OK - confirm folder
▼▲ - select record (1-99)
OK - display value

Folder
Record
Date
Time
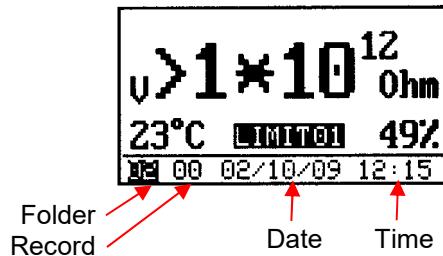
■ Delete results

MENU - press button
Delete results - select
OK - confirm
▼▲ - select folder (1-99)
OK - confirm folder
▼▲ - select record (1-99)
OK - confirm to delete
▼▲ - select yes
OK - delete value
MENU - back to menu

Delete data
Series all
Delete all
Yes / No

■ Change Limits

MENU - press button
Limit - select limit
    OK - select limit (1-19)
▼ - down to name
    OK - enter name for limit
▼ - down to values

Limit
Limit 1
Name:FLOOR
1×10^5 1×10^9

OK - change values
  ▼▲ - increase/decrease
  OK - next value
 MENU - back to limit
MENU - back to menu

```
Set Limit
1*10^5
1*10^9
```
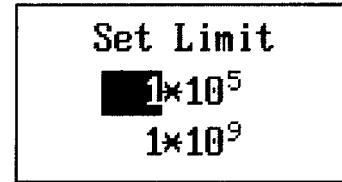
■ Folder names

MENU - press button
Folder Name - select
▼▲ - select folder to change
OK - enter text
  ▼▲ - select character
  OK - insert character
  MENU - back to folder names
MENU - back to menu

```
Folder name
1 2 3 4 5 6 7 8 9 0 A
Ä B C D E F G H I J K
L M N O ö P Q R S T U
ü V W X Y Z   c A End
01  FOLDER 1
```

■ Timeout

MENU - press button
Timeout - select timeout
  OK - change value
MENU - back to menu

```
Limit
Folder Name
Time out  30s
Temperature °C
Date
```
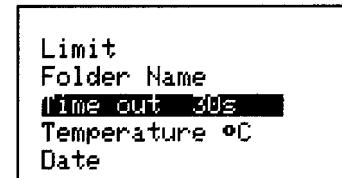
■ Temperature

MENU - press button
Temperature - select temperature
OK - change between °C or °F
MENU Z- back to menu

```
Folder Name
Time out  30s
Temperature °C
Date
Calibration
```
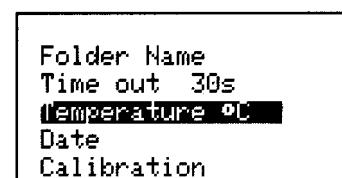
■ Date

MENU - press button
Date - select date
OK - change date
  ▼▲ - increase/decrease value
  OK - accept value
MENU - back to menu

```
Date
02/10/09
12:15:06
```
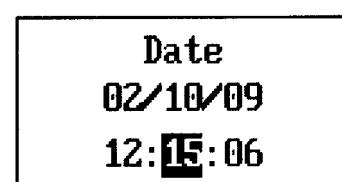
■ Calibration

Calibration date and firmware version display
MENU - press button
Calibration - select calibration
OK - display
MENU - back to menu

```
Calibration
10/06/09
Firmware v2.0
```
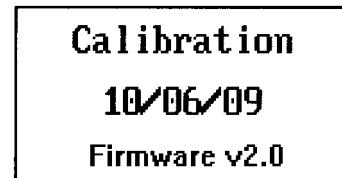
■ Language

MENU - press button
Language - select language
OK - change language
MENU Z- back to menu

```
Time out  30s
Temperature °C
Date
Calibration
Language English
```
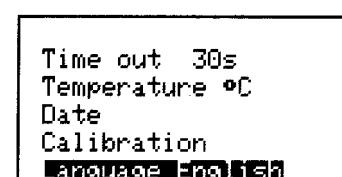
Additional user instructions for the Software are available on the CD-ROM.

Packing List

The SRM®200 includes:

1. Surface Resistance Meter SRM®200
2. Conductive carrying case
3. USB data cable
4. Software on CD-ROM
5. Grounding cord and small alligator clip
6. User's manual (DE / EN)
7. Calibration certificate (DE / EN)

Technical Data

Power supply:	Rechargeable Lithium Battery 3.6V, 900 mAh R6 (AA)
	Charged via external power supply or USB interface
Operating conditions:	- 5 ... + 40 °C, up to 75 % rel. humidity, noncondensing
Storing conditions:	- 10 ... + 50 °C, up to 85 % rel. humidity, noncondensing
Connectors:	2 banana sockets - short version (15 mm)
Resistance measuring range:	1×10^3 - 1×10^{12} Ω
Temperature measuring range:	0 - 50 °C +/- 1 °C
Humidity measuring range:	10 - 90 % r.F. +/- 5 %
Memory:	9801 measuring values
Test voltage (open-circuit):	100 V
Dimensions:	145 x 80 x 35 mm (L x B x H)
PC interface:	USB 2.0
Case:	ABS
Weight:	290 g

Measuring range	Display range	Resolution	Accuracy
10^3 Ω	1×10^3 - 9×10^3	1 kΩ	10 % reading
10^4 Ω	1×10^4 - 9×10^4	10 kΩ	10 % reading
10^5 Ω	1×10^5 - 9×10^5	100 kΩ	10 % reading
10^6 Ω	1×10^6 - 9×10^6	1 MΩ	10 % reading
10^7 Ω	1×10^7 - 9×10^7	10 MΩ	10 % reading
10^8 Ω	1×10^8 - 9×10^8	100 MΩ	10 % reading
10^9 Ω	1×10^9 - 9×10^9	1 GΩ	10 % reading
10^{10} Ω	1×10^{10} - 9×10^{10}	10 GΩ	25 % reading
10^{11} Ω	1×10^{11} - 9×10^{11}	100 GΩ	25 % reading
10^{12} Ω	1×10^{12}	1 TΩ	25 % reading

Spare Parts

Part number	Description
7100.SRM200.RUB	Conductive rubber (Set of 2 pieces)
7100.SRM200.AKKU	Lithium rechargeable battery
7100.SRM200.L.USB	USB Cable

Trouble-Shooting

Problem	Cause	Remedy
No operation	Battery discharged	Connect computer to charge the rechargeable battery
No operation even after charging	Battery defect	Replace battery
No operation after battery replacement, red LED inside the battery case on	Wrong polarity	Insert battery in correct polarity
Conductive rubber defect	Wear	Replace contact rubber

Notice

This instrument is **not** approved for measurements in explosion hazard areas!

High electrostatic charges or measuring insulating highly charged materials might damage the instrument!

Using the instrument in power plants is **not** permitted.

Maintenance

Battery condition is permanently monitored in the LCD display.
Connect the instrument to a computer to charge the rechargeable battery in time.
The unit won't switch on if the battery is damaged. Unscrew the battery lid at the backside of the unit to replace the battery. Replace only a rechargeable battery of the **same type** and take care of the polarity.

Warranty

The warranty does not include the rechargeable battery, battery damage due to drainage, and mechanical damage of the instrument. The warranty is void if the unit is opened.

Repair

Repairs shall be carried out by qualified personnel only.

In case you send the instrument for repair, please pack it safely and state clearly the problem

Calibration

The recommended calibration interval is 2 years.

Waste Disposal

According to WEEE Directive 2012/19/EU the device is marked with this symbol.

This device must therefore not be disposed of with the household waste.

Batteries or **rechargeable batteries** must be disposed at the arranged collection points or according to the relevant national guidelines.