

# EARTH RESISTANCE METER

## MRU-200



**MRU-200**  
is the unique meter in the market  
which uses all measurement methods.

#### Possible measurements:

- earth resistance measurement with 2-pole, 3-pole, 4-pole method,
- selective earth resistance measurement with clamp (no influence from parallel earths; no opening of rusty junctions is needed),
- impulse earth resistance measurement, three kinds of measuring impulse 4/10 $\mu$ s, 8/20 $\mu$ s, 10/350 $\mu$ s,
- two clamps earth resistance measurement without auxiliary test probs,
- earth resistivity measurement,
- leakage current measurement,

#### Standard accessories of the meter MRU-200:

- Test lead with banana plug; 1,2m; red
- Test lead with banana plugs 2,2m; black
- Test lead on a reel with banana plugs; 25m red
- Test lead on a reel with banana plugs; 25m blue
- Shielded test lead on a reel with banana plugs; 50m yellow
- USB transmission cable
- charger for battery loading from the socket of car lighter (12V)
- Earth contact test probe (rod); 0,30m - (4 pcs.)

- WAPR1X2REBB** - Carrying case L2
- WAPR2X2BLBB** - Ni-MH battery package 4,8V 4,2Ah
- WAPR025REBBSZ** - „Crocodile” clip K01; black
- WAPR025BUBBSZ** - „Crocodile” clip K02; red
- WAPR050YEBBSZE** - Cramp
- WAPRZUSB** - Power supply adaptor Z7
- WAPRZLAD12SAM** - Cable for battery charger
- WASONG30** - Hanging straps
- Calibration certificate issued by calibration laboratory

- WAFUTL2**
- WAAKU07**
- WAKROBL20K01**
- WAKRORE20K02**
- WAZACIMA1**
- WAZASZ7**
- WAPRZLAD230**
- WAPOZSZEKPL**

#### Optional accessories of the meter MRU-200:

- Hard carrying case
- Earth contact test probe (rod); 0,80m
- Test lead with banana plugs 2m (N-1)
- Current clamp C-3 ( $\varnothing=52$ mm)
- Current clamp N-1 ( $\varnothing=52$ mm)
- Current flexible clamp (Rogowsky coil) F-1 ( $\varnothing=400$ mm)

- WAWALX13** - Battery case LR14 (size C)
- WASONG80** - Software for creation of documentation from electrical measurements „SONEL PE4”
- WAPR002DZBB** - Carrying case L3
- WACEG30KR**
- WACEGN1BB**
- WACEGF10KR**

- WAPOJ1**
- WAPROSONPE4**
- WAFUTL3**

**Sonel S.A.**  
Wokulskiego 11  
58-100 Świdnica, PL  
tel. +48 74 85 83 860  
fax +48 74 85 83 809

[export@sonel.pl](mailto:export@sonel.pl)  
[www.sonel.pl](http://www.sonel.pl)



# MRU-200

## • It allows to take the measurements of:

- earthing resistance using auxiliary electrodes,
- earthing resistance using auxiliary electrodes and clamp (for measurements of multiple earthing)
- earthing resistance using double clamps (for measurement of earthing when it is impossible to use auxiliary electrodes),
- impulse earth resistance (without disconnecting measured earthing),
- ground resistivity (Wenner method),
- current using the clamp (e.g. leakage) and flexible clamp (Rogowsky coil),
- measurement of continuity of equipotential bondings and protective conductors (meeting the requirements of IEC 60364-6-61:2000 section 6.12.2) with auto-zero function – with current 200mA.

## • Additionally:

- measurement of resistance of auxiliary electrodes  $R_s$  and  $R_H$ ,
- measurement of interference voltage,
- measurement of interference frequency,
- measurement in the presence of interference voltage in the power network with frequency 16 2/3 Hz, 50Hz, 60Hz and 400Hz (with automatic selection of proper frequency of measuring signal or with manual selection),
- selection of maximum measuring voltage (25V and 50V)
- introducing the distance between the electrodes for the resistivity in metres (m) and feet (ft),
- memory of 990 measurements (10 banks of 99 cells each),
- calibration of clamp used,
- real time clock (RTC),
- data transmission to the computer (USB),
- indication of battery state.

### Electric security:

- type of insulation double, according to EN 61010-1 and IEC 61557
- measurement category CAT IV 300V acc. to EN 61010-1
- protection class acc. to EN 60529 IP54

### Rated operational conditions:

- operation temperature -10...+50°C
- storage temperature -20...+70°C
- humidity 20...80%

### Other technical data:

- LCD display graphic, backlighted
- interface USB
- number of measurements carried out of set of batteries > 1200
- warranty 24 months

### Measurement of interference voltage

Range	Resolution	Accuracy
0...100V	1V	±(2% m.v. + 3 digits)

### Measurement of interference frequency

Range	Resolution	Accuracy
15...450Hz	1Hz	±(1% m.v. + 2 digits)

### Measurement of earthing resistance (method 3- and 4-pole)

measurement range to IEC61557-5: **0,100Ω...19,9kΩ**

Range	Resolution	Accuracy
0,000...3,999Ω	0,001Ω	±(2% m.v. + 4 digits)
4,0...39,99Ω	0,01Ω	±(2% m.v. + 2 digits)
40...399,9Ω	0,1Ω	
400...3999Ω	1Ω	
4,00k...19,99kΩ	0,01kΩ	±(5% m.v. + 2 digits)

### Measurement of continuity of equipotential bondings and protective conductors ( $R_{cont}$ ) measurement range to IEC61557-4: **0,045Ω...19,99kΩ**

Range	Resolution	Accuracy
0,00...3,999Ω*	0,001Ω	±(2% m.v. + 4 digits)
4,0...39,99Ω	0,01Ω	±(2% m.v. + 2 digits)
40,0...399,9Ω	0,1Ω	
400...3999Ω	1Ω	
4,0k...19,99kΩ	0,01kΩ	±(5% m.v. + 2 digits)

\* - in range 0,000...0,045Ω the accuracy is not specified.

### Measurement of resistance of auxiliary electrodes $R_H$ and $R_S$

Range	Resolution	Accuracy
0...999Ω	1Ω	±(5% ( $R_S+R_E+R_H$ )) + 8 digits)
1,00k...9,99kΩ	0,01kΩ	
10,0k...19,9kΩ	0,1kΩ	

### Measurement of multiple earthing resistance with using the clamp and auxiliary electrodes (3p + clamp) measurement range to IEC61557-5: **0,120Ω...1999Ω**

Range	Resolution	Accuracy
0,00...3,999Ω*	0,001Ω	±(8% m.v. + 4 digits)
4,0...39,99Ω	0,01Ω	±(8% m.v. + 3 digits)
40...399,9Ω	0,1Ω	
400...1999Ω	1Ω	

\* - in range 0,000...0,045Ω the accuracy is not specified.

### Measurement of multiple earthing resistance with using double clamps

Range	Resolution	Accuracy
0,00...19,99Ω	0,01Ω	±(10% m.v. + 3 digits)
20,0...149,9Ω	0,1Ω	±(20% m.v. + 3 digits)

### Measurement of ground resistivity Measurement method: Wenner, $\rho=2\pi LR_E$

Range	Resolution	Accuracy
0,0...199,9Ωm	0,1Ωm	depending on measurement accuracy $R_E$ with 4p method, but not less than ±1 digit
200...1999Ωm	1Ωm	
2,00k...19,99kΩm	0,01kΩm	
20,0k...99,9kΩm	0,1kΩm	
100k...999kΩm	1kΩm	

L – distance between probes: 1...50m

### Measurement of AC current (leakage)

Range	Resolution	Accuracy
0,1...99,9mA <sup>1</sup>	0,1mA	±(8% m.v. + 5 digits)
100...999mA <sup>1</sup>	1mA	±(8% m.v. + 3 digits)
1,00...4,99A <sup>1,2</sup>	0,01A	±(5% m.v. + 5 digits) <sup>1</sup> unspecified <sup>2</sup>
5,00...9,99A <sup>1,2</sup>	0,01A	±(5% m.v. + 5 digits)
10,0...99,9A <sup>1,2</sup>	0,1A	
100...300A <sup>1,2</sup>	1A	

<sup>1</sup> – receiving clamp (diameter 52mm) – C-3

<sup>2</sup> – flexible clamp (Rogowsky coil) with diameter 400 mm – F-1

### Measurement of dynamic earthing resistance ( $R_b$ ) with impulse wave method (4 p<sup>1</sup>)

Range	Resolution	Accuracy
0,0...99,9Ω	0,1Ω	±(2,5% m.v. + 3 digits)
100...199Ω	1Ω	

choice impulse edges: 4/10μs, 8/20μs, 10/350μs

„m.v.”- measured value