

Sonel MRU-200-GPS / MRU-200

Earth Resistance Meter



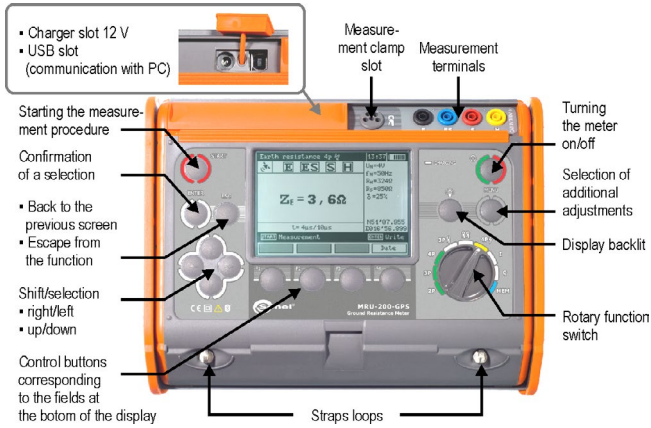
The meter is designed for measurements at interference voltages which do not exceed 24 V for R_E measurements and 3 V for R_{CONT} measurements. The voltage is measured up to 100 V, but above 40 V is indicated as dangerous. The meter must not be connected to voltages exceeding 100 V.



v1.00 | 30.10.2018



WARNINGS AND INFORMATION DISPLAYED BY THE METER



$U_N > 24V!$	The voltage on the measurement points exceeds 24 V but is lower than 40 V. The measurement is blocked.
$U_N > 40V!$ and a continuous sonic signal	The voltage on the measurement points exceeds 40 V. The measurement is blocked.
NOISE!	The value of the interfering signal is too high. The result may be distorted by additional uncertainty.
$R > 19,99k\Omega$ $R_e > 19,99k\Omega$ $R_s > 19,9k\Omega$ $R_p > 19,9k\Omega$ $\rho > 999k\Omega m$	Measurement range exceeded.
LIMIT!	The uncertainty of the electrode resistance >30%. Uncertainties calculated on the basis of the measured values.

$I_L > max$	Excessive interfering current, the measurement error may exceed the basic error.
Power supply status	
	Battery charged.
	Battery low.
	Battery fully discharged.
	Battery fully discharged, measuring blocked.

First steps

- Turn the meter on. Select a measurement method.
- Connect the meter to the object. Using F4 button you can open help.
- Configure the measurement. Enable GPS (only MRU-200-GPS).
- Run the measurement.
- Read out the result and GPS coordinates (F4) and save them to the memory.

Wire continuity measurement

Connect the meter to the measured wire.

2P

Run the measurement using **START** button.

Main result: $R = 3,080\Omega$

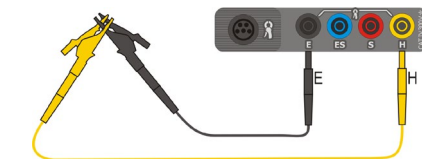
Measurement date: 2014.01.22 13:36

GPS coordinates: N51°07.955 E016°56.899

In order to eliminate the influence of the resistance of the test leads over the result of the measurement, it is possible to realize its compensation (auto-zeroing).

Enabling auto-zeroing

Using button F1 enable **AUTOZERO** mode. Short-circuit the test leads.



Press **START**.

Disabling auto-zeroing

Using button F1 enable **AUTOZERO** mode. Separate the test leads.



Press **START**.

It is sufficient to realize compensation once for the given test leads. It is also remembered once the meter has been turned off, until the next successful auto-reset procedure.

Current measurement

Connect the meter to the measured object.

Run the measurement using **START** button.

Press **START**.

Using button F1 select the type of clamps.

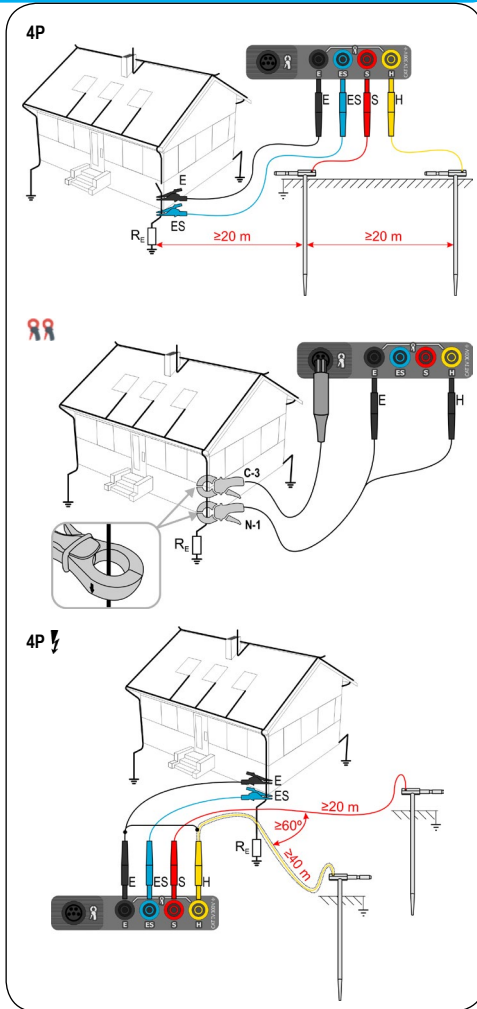
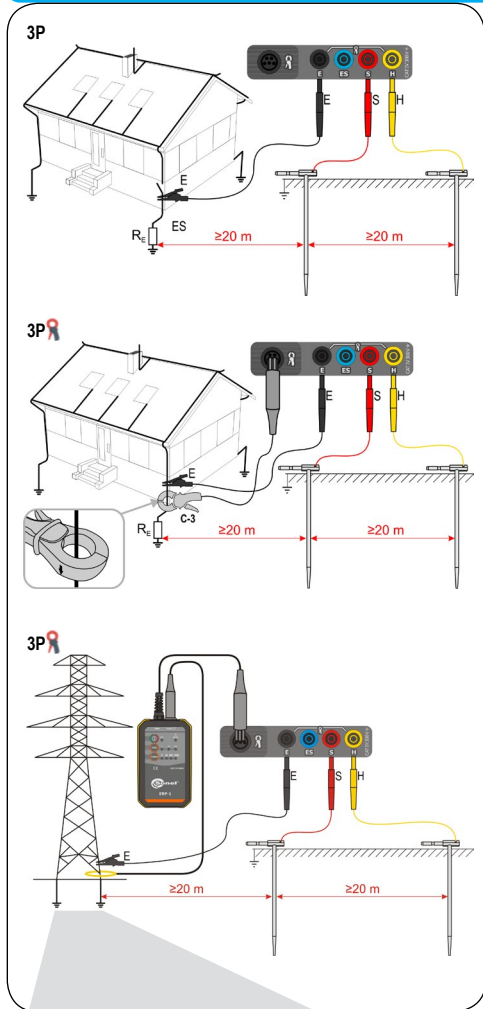
Using **START** button run the measurement.

Main result: $I = 2,1mA$



Find more information in the user manual and on our website www.sonel.pl/en

Selection of R_E measurement method



Configuration and measurement of R_E

Earth resistance 4p 21:38

$R_E = \text{---}$

$U_n = 25V$ $f_n = 50Hz$

START Measurement ENTER Last result

U_n HELP

Enter settings

- F1 voltage/pulse shape
- F2 selection of C-3/ERP-1 (3P+clamps method)
- F3 selection of the number of pole legs (ERP-1)

START Using button START run the measurement.

F4 Using button F4 display coordinates of the measured point.

Earth resistance 4p 13:37

$R_E = 2,987\Omega$

$U_n = 25V$ $f_n = 50Hz$

START Measurement ENTER Write

Main result

Additional results

GPS coordinates

U_n voltage on the measurement points
 f_n interference frequency
 I_n interfering current
 R_H resistance of current electrode
 R_S resistance of voltage electrode
 δ additional uncertainty caused by the resistance of the electrodes
 $R_1 \dots R_4$ earth resistance of the pole leg nr. 1...4

Measurement of R_E of poles using ERP-1 adapter

Connect the meter to the leg of the measured pole.

ERP-1

FLEX Using FLEX button select the type of flexible clamps connected to the device.

TURNS Using TURNS button select the number of flexible clamp wraps around the pole leg.

MRU-200-GPS / MRU-200

Press F2 and select ERP-1 adapter.

START Using START button run the measurement. Wrap the clamps around next legs according to instructions on the display. Keep one direction of connecting to pole legs (clockwise or counter-clockwise).

Earth resistance 3p 09:20

$R_E = 1,398\Omega$

Resistance of individual pole legs

Resultant resistance

$U_n = 50V$ $f_n = 50Hz$

ENTER Write ENTER Choose

Earth resistivity measurement

Connect the meter to the measured earth.

P

Earth resistivity 21:48

$\rho = \text{---}$

$U_n = 25V$ $f_n = 50Hz$ $L = 1/50m$

START Measurement

U_n HELP

Enter settings

- F1 measuring voltage

START Press START.

ENTER Using buttons \blacktriangle \blacktriangledown enter the distance between electrodes.

ENTER Using button ENTER run the measurement.

Earth resistivity 21:54

$\rho = 229\Omega m$

Main result

Additional results

GPS coordinates

Saving a result to the memory

Earth resistance 4p 13:37

$R_E = 2,987\Omega$

$U_n = 25V$ $f_n = 50Hz$

START Measurement ENTER Write

ENTER After the measurement press ENTER.

Select memory cell using buttons \blacktriangle \blacktriangledown .
 Select memory bank using buttons \blacktriangleleft \blacktriangleright .

Memory write 00:12

Meas. 7/99 Bank 2/10

Target cell empty

Memory write 00:12

Meas. 5/99 Bank 2/10

Earth resistance 4p

$R_E = 2,974\Omega$

$U_n = 25V$ $f_n = 50Hz$

Meas. Bank ENTER Save ESC Exit

ENTER Press ENTER to save the result.