



## CS-1 CABLE SIMULATOR



### OPERATING MANUAL

This accessory is designed for training and presentation purposes and for providing rough estimates of resistance measurement accuracy. The results obtained from the measurements with the simulator shall be treated as estimated values, and not as calibration results. CS-1 cable simulator is designed to simulate the insulation resistance of power cables. The adapter is equipped with banana sockets with a diameter of 4 mm. This allows user to perform resistance measurements with majority of meters designed for this purpose and offered by Sonel SA. The user of the cable simulator is able to check the correctness of measuring results provided by devices of MIC series (insulation resistance meters). Other devices compatible with CS-1 include multifunctional electrical installation meters, with the function of insulation resistance measurement. Please note that the results presented in the display of the meters are approximate, and that presented value is within the basic error range of the meter itself and the cable simulator. The resistance value provided by the simulator may for a long time remain under constant external voltage, up to 1000 V. The housing is highly resistant to mechanical damage. The device allows user to perform a simulation of measurements for four resistance values.

#### Note:

**Due to continuous product improvement and increasing its technical parameters and performance, there may be slight design changes, not reflected in this edition of the manual.**



- [1] – housing
- [2] – measuring terminals
- [3] – resistance values of measuring circuits

## 1 Safety

In order to provide conditions for correct operation and the correctness of the obtained results, the following recommendations must be observed:

- Before you proceed to operate the device, acquaint yourself thoroughly with this manual and observe the safety regulations and specifications provided by the producer.
- Any application that differs from those specified in the present manual may result in a damage to the device and constitute a source of danger for the user.
- The accessory should be operated only by suitably qualified persons having the necessary permissions to carry out measurements on electrical systems. Operating the simulator by unauthorised personnel may result in damage to the device and constitute a source of danger for the user.
- The accessory must not be used for networks and devices in areas with special conditions, e.g. fire-risk and explosive-risk areas.
- Do not exceed the maximum allowable input voltage range.
- When working with the simulator use the appropriate test probes.
- Before measurement make sure that test leads are connected to appropriate measuring terminals.
- It is unacceptable to operate the accessory when:
  - ⇒ it is damaged and completely or partially out of order,
  - ⇒ it was stored for an excessive period of time in disadvantageous conditions (e.g. excessive humidity) **Before using, leave the accessory for at least 12 hours in normal climatic conditions consistent with the device specifications.**

**Note!**  
**Do not connect the simulator to the mains.**

## 2 Operation

- Before using the accessory check its housing for any damage.
- In order to measure one of the four resistances, attach the cables connected to Riso+ and Riso- sockets of the meter to one of the circuits on the simulator.
- Set the test voltage in the meter - max. 1000 V.
- Start the measurement by pressing the appropriate button on the meter.
- After completing the measurement, read the value from the display.
- Value of the insulation resistance displayed by the device after the measurement should match the resistance of the tested circuit. When reading the value displayed by the measuring device, remember about the measurement error specified in the technical specifications.

## 3 Cleaning and maintenance

**CAUTION!**  
**Apply only maintenance methods specified by the manufacturer in this manual.**

The simulator may be cleaned with a soft, damp cloth using all-purpose detergents. Do not use any solvents or cleaning agents which may scratch the housing (powders, pastes, etc.).

## 4 Storage

Store the device in a dry place with the humidity not exceeding the value given in the manual.

## 5 Dismantling and utilisation

Worn-out electric and electronic equipment should be gathered selectively, i.e. it must not be placed with waste of another kind.

Worn-out electronic equipment should be sent to a collection point in accordance with the law of waste electrical and electronic equipment.

Before the equipment is sent to a collection point, do not dismantle any elements.

Observe local regulations concerning disposal of packages, waste batteries and accumulators.

## 6 Technical data

- a) insulation type: double, according to IEC 61010-1
- b) protection class of enclosure acc. to IEC 60529: IP40
- c) maximum measuring voltage: 1000 VDC
- d) resistance value on individual circuits – 10 MΩ, 22 MΩ, 51 MΩ, 68 MΩ
- e) basic error of displayed values: +/- 1%
- f) temperature resistance factor/ resistance stability as a function of temperature: +/-200ppm per each +/- 1°C
- g) time resistance factor/ resistance stability as a function of time: after 1000 hours the resistance changes +/- 5%
- h) dimensions: width 87 mm, length 87 mm, height 58 mm
- i) weight: 142 g
- j) operating temperature: 0°C..+60°C
- k) relative humidity: 20%..90%
- l) maximum operating altitude: 2000 m above sea level
- m) storage temperature: -30°C..+65°C
- n) the accessory is equipped with five banana sockets (4 mm)
- o) quality standard: construction, design and manufacturing are ISO 9001 compliant

## 7 Manufacturer

The manufacturer of the device and provider of guarantee and post-guarantee service:

#### SONEL S.A.

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**Note:**  
**Service repairs must be performed only by the manufacturer.**