# Sonel®

Insulation resistance meter

# MIC-RS

**MIC-RS: RS-232, MIC-RS-SCP** | index: WMGBMICRS232
**MIC-RS: RS-232, Modbus** | index: WMGBMICRS232M
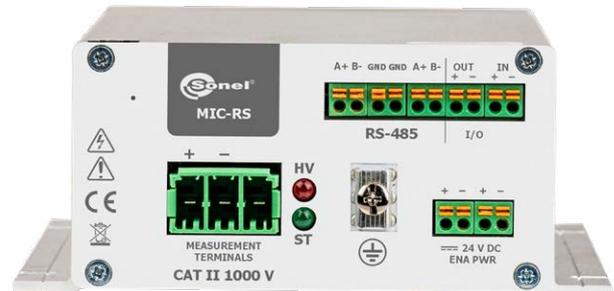**MIC-RS: RS-485, Modbus** | index: WMGBMICRS485M

**CAT II**
**1000 V**

version with
**RS-232 interface**

version with
**RS-485 interface**

**MIC-RS-SCP**
communication protocol

**OR**

**MODBUS**
communication protocol

**MODBUS**
communication protocol

# Designed for the industry

## Features

- Measurement voltage selected within the range of **50...1000 V**
- Automatic discharge of the measured object's capacitance upon completion of insulation resistance measurement
- Measurement current **≤2 mA**
- Protection against measurement of live objects
- Two-lead method of insulation resistance measurement

## Additional features

- Capacitance measurement after measurement of $R_{ISO}$
- Low-voltage measurement of resistance
- RS-232 or RS-485 interface
- Data transmission to a controlling device through the MIC-RS-SCP or Modbus communication protocol
- External power supply
- The instrument meets the requirements laid down by standard EN IEC 61557

## Variants

| Model | Interface | Communication protocol | Index |
|-------|-----------|------------------------|-------|
| MIC-RS | RS-232 | MIC-RS-SCP | WMGBMICRS232 |
| MIC-RS | RS-232 | Modbus | WMGBMICRS232M |
| MIC-RS | RS-485 | Modbus | WMGBMICRS485M |

It is possible to prepare a version of the meter with the interface and communication protocol requested by the customer.

## Application

The instrument is dedicated for companies and sites, in which continuous or random assessment of the insulation resistance is required as part of production. It is also perfect for automated production systems.

The meter can be installed in the distribution board, at the operator's station (assembly or quality control bench), in the control cabinet or even in the rack enclosure. The measurement is performed by means of clamps, used to connect the test leads of the system, in which the instrument is installed.

## Features

The meter is designed for building in/permanent installation. It plays a Secondary/Slave role, meaning that it executes the commands issued by the Main/Master control device and it does not initialise the transmission on its own. It enables measuring the insulation resistance with the test voltage of up to 1000 V.

The scope set of functions of the meter is tailored to specialised applications. With the **AutoRange** function, available in two versions, the instrument can switch the test voltage dynamically and adjust it to the current conditions.

There are two measurement modes available: **automatic** (continuous) and **manual** (one-time). Under automated testing, the meter can be programmed to measure the capacity or not. In addition, **the user may define the default function** of the device as the measurement of insulation resistance ($R_{ISO}$), or low resistance ($R_x$).

## Response and communication

The functionality of the instrument is extended by digital input and output. This enables the meter to respond to the events in the system, in which it operates.

The meter is operated from the Main/Master control device by means of the **MIC-RS-SCP serial communication protocol** or **Modbus protocol**. It enables, for example, starting and stopping the measurement of resistance, reading the measurement result or changing the configuration of the instrument.
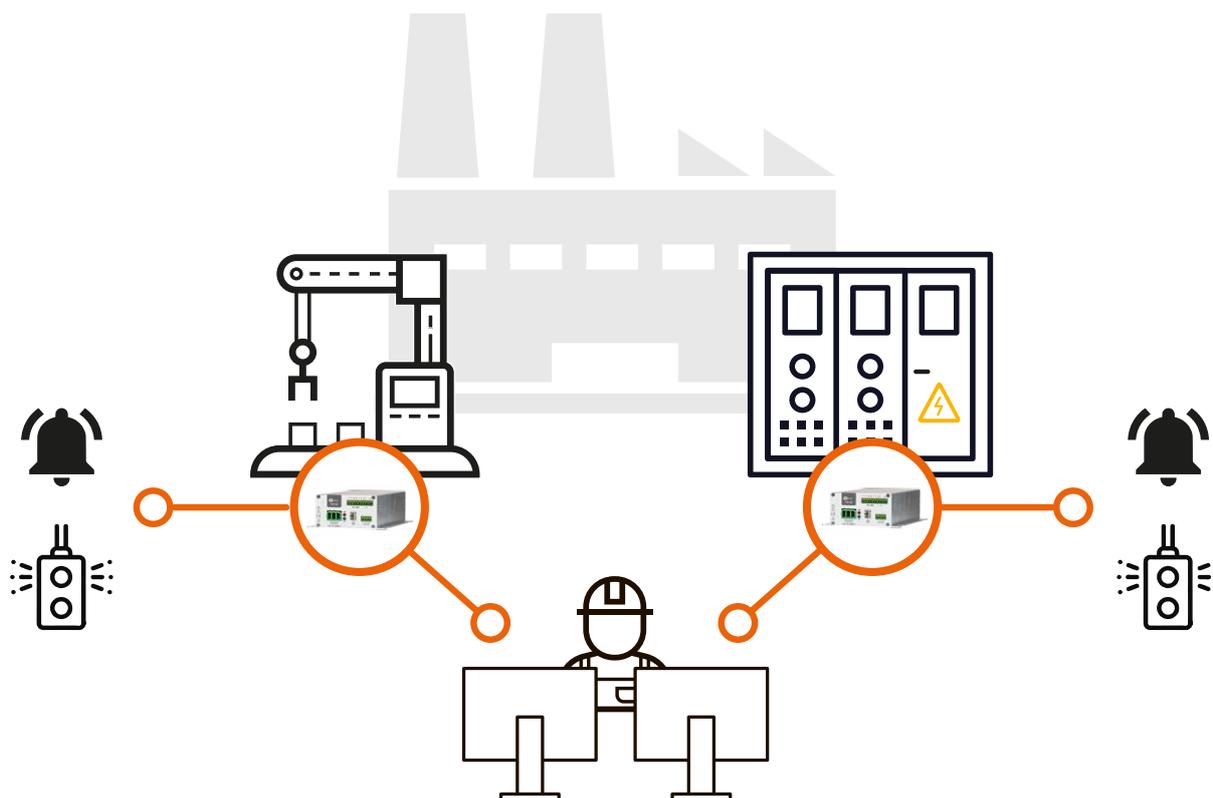
# Specifications

| Measurement functions | Measurement range | Reading range | Resolution | Accuracy ±(% m.v. + digits) |
|---|---|---|---|---|
| **Insulation resistance** | | | | |
| Measuring voltage 500 V<br>$I_{ISOnom}$ = 2 mA + ⟨-0.8...0 mA⟩ | 500 kΩ...2.00 GΩ<br>acc. to IEC 61557-2 | 1.00 kΩ...2.00 GΩ | from 0.01 kΩ | from ±(3% m.v. + 8 digits) |
| Measuring voltage 1000 V<br>$I_{ISOnom}$ = 2 mA + ⟨-0.8...0 mA⟩ | 1000 kΩ...9.99 GΩ<br>acc. to IEC 61557-2 | 1.00 kΩ...2.00 GΩ | from 0.01 kΩ | from ±(3% m.v. + 8 digits) |
| Capacitance measurement after $R_{ISO}$ measurement | 0 µF...9.9 µF | 0 µF...9.9 µF | 0.1 µF | ±(5% m.v. + 6 digits) |
| **Measurement of resistance with low current** | 0.0 Ω...999 Ω | 0.0 Ω...999 Ω | from 0.1 Ω | from ±(3% m.v. + 4 digits) |

# Other technical data

## Safety and work conditions

| | |
|---|---|
| **Type of insulation according to EN 61010-1 and IEC 61557** | basic |
| **Measuring category according to EN 61010** | |
| rated operating altitude ≤2000 m | II 1000 V |
| **Power supply of the meter** | external, isolated<br>24 V DC (20...28 V DC) / 0.4 A / 10 W |
| **Dimensions** | 55 x 130 x 215 mm |
| **Meter weight** | ca. 0.8 kg |
| **Storage temperature** | -20...+70°C |
| **Operating temperature** | -5...+50°C |
| **Humidity** | 20...80% |
| **Reference temperature** | 23 ± 2°C |
| **Reference humidity** | 40%...60% |

## Memory and communication

| | |
|---|---|
| **Memory of measurement results** | - |
| **Data transmission** | RS-232 or RS-485 |

## Other information

| | |
|---|---|
| **Quality standard for design, construction and manufacturing compliant with** | ISO 9001, ISO 14001, ISO 45001 |
| **The device meets the requirements of** | EN 61010-1, EN IEC 61557, EN IEC 61010-2-030 |
| **The product meets EMC requirements (immunity for industrial environment) according to the following standards** | EN IEC 61326-1, EN IEC 61326-2-2 |

# Standard accessories

Factory calibration certificate

# Optional accessories

Calibration certificate with accreditation

„m.v." - measured value

max measure-
ment voltage [V]

weight [kg]

5000 ········································································· MIC-RS3

                                              MIC-RS2

3

2.5

2500 ································· 

2

MIC-RS

1.5

1000 ····· 

1

500

0.5

0.8 kg          1.5 kg          1.5 kg

2 G              2.5 T            5 T          max measure-
                                              ment range [Ω]

RS-232 + MIC+RS-SCP      RS-485 + MIC+RSx-SCP + Modbus    RS-485 + MIC+RSx-SCP + Modbus
RS-232 + Modbus
RS-485 + Modbus