# USER MANUAL

# SONEL MIC MOBILE

## app

**Applies to insulation resistance meters:**
**MIC-15k1**
**MIC-10s1 ● MIC-05s1**
**MIC-10k1 ● MIC-5050**
**MIC-5010 ● MIC-5005**

**SONEL S.A.**
**Wokulskiego 11**
**58-100 Świdnica**
**Poland**

Version 1.02 03.01.2023

Sonel MIC Mobile is designed for remote readout of measurement results and for control via Bluetooth. Please acquaint yourself with this manual in order to avoid problems in operation of the application.

The manual is updated periodically. The latest version can be downloaded from www.sonel.pl/en.

## CONTENTS



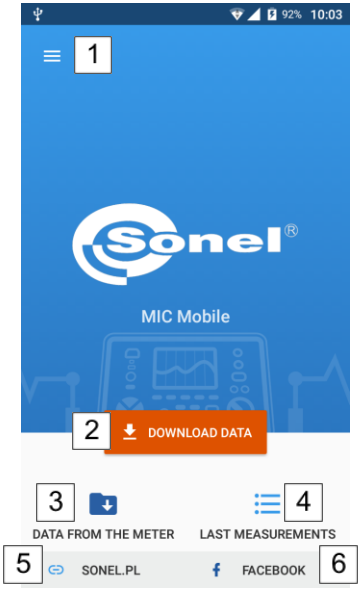
- The application works with devices operating on Android system in version 5.0 and later. Before installing the app, make sure that you have the latest version of the system. Version other than the recommended may cause problems with the use or improper work of the application.
- The application requires Bluetooth communication and GPS location to be enabled for proper operation.

# 1 Getting started with the app

1. Turn on Bluetooth communication in the meter

2. Turn on the application.


3. The main application panel will be shown.




1. Hidden **side menu**
2. Access to:
   - data download from the meter
   - remote control of the meter
3. Data menu for data obtained and downloaded from the meter
4. List of measurements triggered from Sonel MIC Mobile
5. Access to the manufacturer's website
6. Access to the manufacturer's Facebook profile

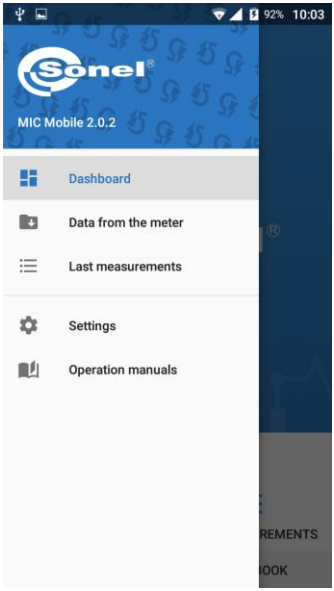
Double clicking **back** in the phone minimizes the application.

# 2 Side menu

1


On the main screen
(a) select icon ☰ or
(b) swipe from the left edge of the screen to the right.

2



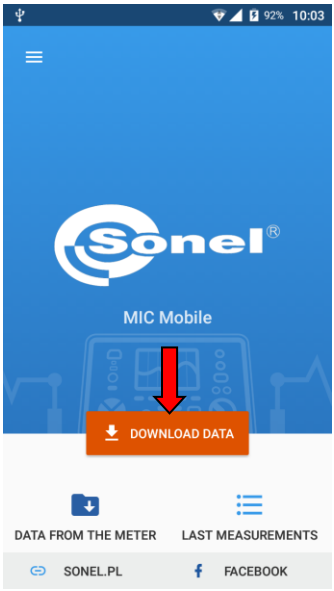

The menu with options will be displayed.

- **Dashboard** – return to the main panel.
- **Data from the meter** – menu of data downloaded from the meter.
- **Last measurement** – list of measurements triggered from Sonel MIC Mobile.
- **Settings** – list of related meters and changing their labels and information about the application.
- **Operation manuals** – redirects user to a website for downloading the manual of the meter.

# 3 Remote control of the meter

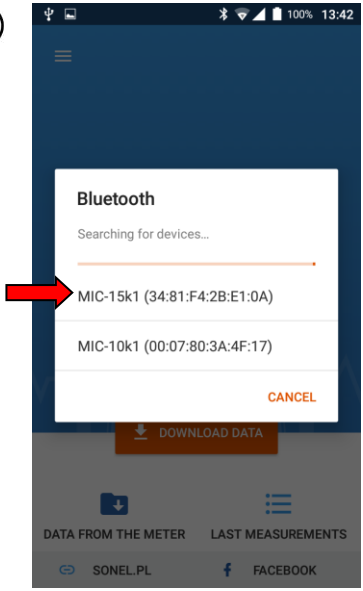
Connection with the meter depends on the phone's Bluetooth range. Do not move too far with the phone from the mobile device - it may break the connection.

1



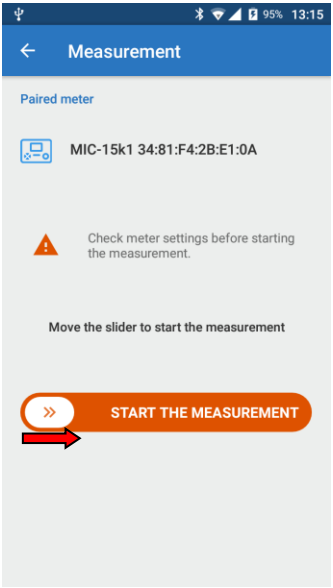

On the main panel of the application, select **Download data.**

2




Select the meter.

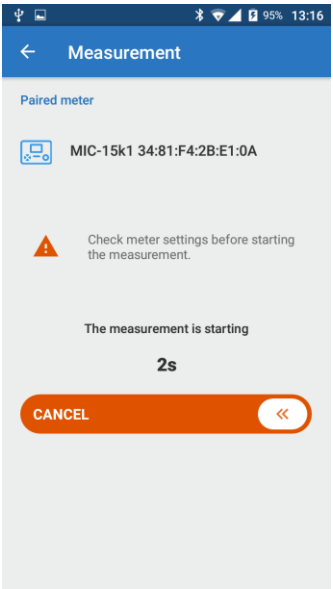
3




- The screen for remote triggering of measurement will be shown.
- Prepare the meter as described in its manual:
  - ⇒ turn ON the Bluetooth function,
  - ⇒ enter measurement settings,
  - ⇒ turn ON the remote control.
- Swipe icon » to start the measurement.
- If the remote control is inactive, the following message will be displayed.

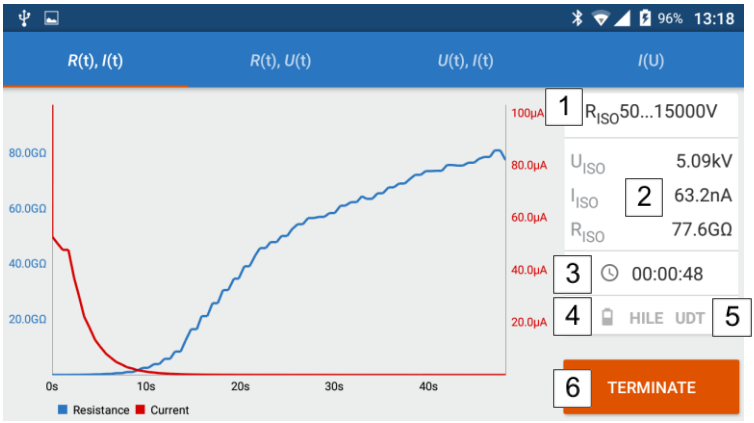
Remote control blocked or incorrect measuring conditions.

4




- The measurement is preceded by a 5-second countdown, indicated by the meter with beeps.
- During the countdown, the meter does not generate voltage.
- During the countdown, the measurement may be cancelled by swiping left the following icon «.

**5** Measurement in progress.




Selecting items on the top bar of the screen, you may display different waveforms of measured parameters:

- resistance and current as a function of time,
- resistance and measuring voltage as a function of time,
- voltage and current as a function of time,
- current as a function of measuring voltage.

The side panel has the following items:

1 currently set measuring function (position of the meter's knob)

2 instantaneous values of the measured parameters,

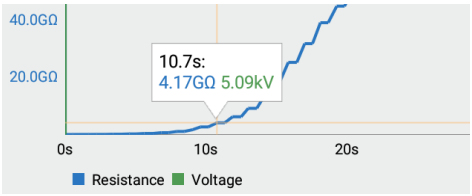
3 duration of the measurement,

4 meter's battery charge level,

5 interferences on the measured object,

6 icon terminating the measurement.

To display the box with instantaneous values, touch the graph at the selected point.

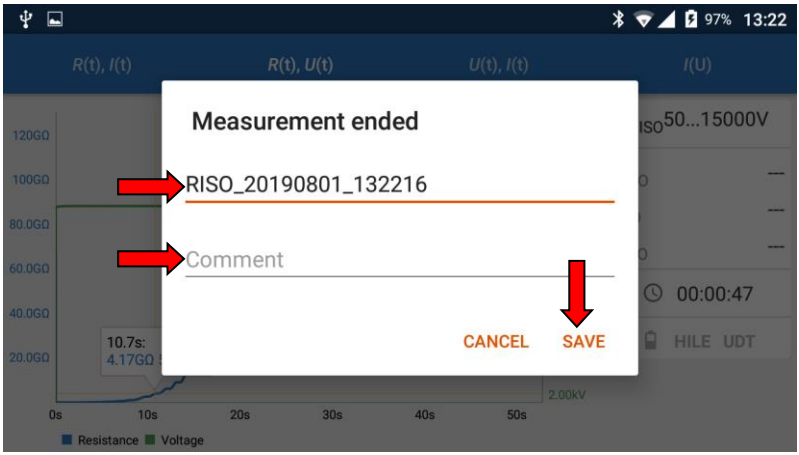



The graph may be:

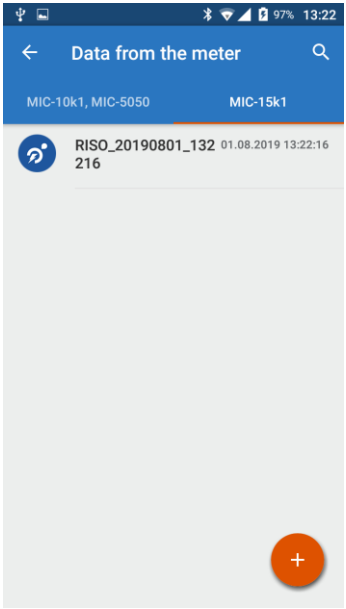
- swiped (with a finger),
- zoomed-in by a double tap,
- scaled (zoom-in / zoom-out) by pitching / spreading two fingers on the screen.

6

- After the measurement is completed / terminated, an appropriate window is shown. Use it to save the recorded data to the application memory.
- The default data package name contains the type of measurement, date and time it was taken.
- Before saving, you can change the name of the package and add a comment.




7

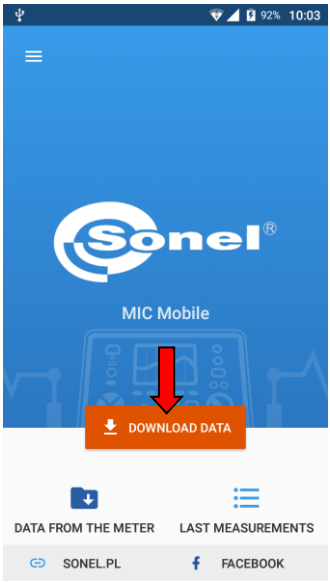



Saved data is in the location **Data from the meter**, **right** tab.

# 4 Downloading data from the meter

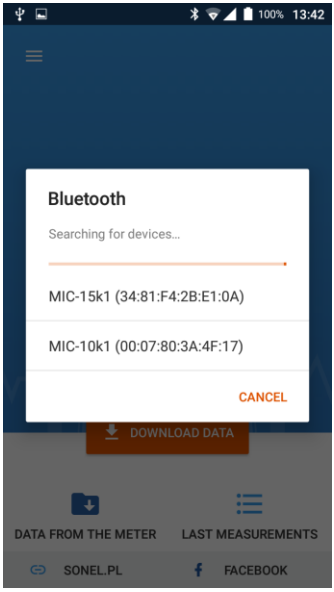
## *4.1 Method 1*

1



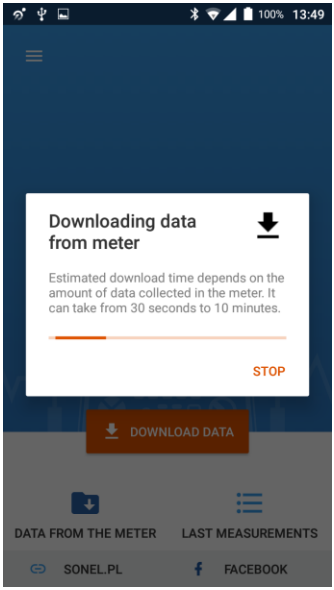

- Set the knob of the meter on the position marked as **MEM**.
- On the main panel of the application, select **Download data.**
- If the knob is in a position other than 'MEM', the meter will not be detected.

2



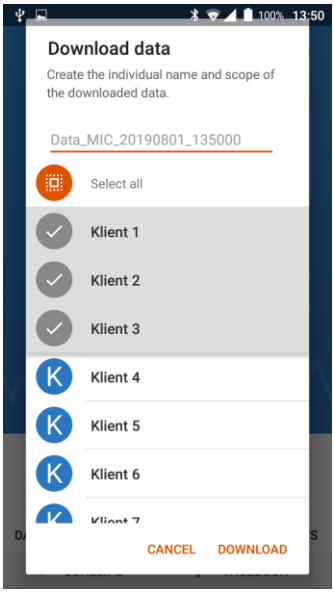

The menu with available devices will be shown. Select the meter.

3



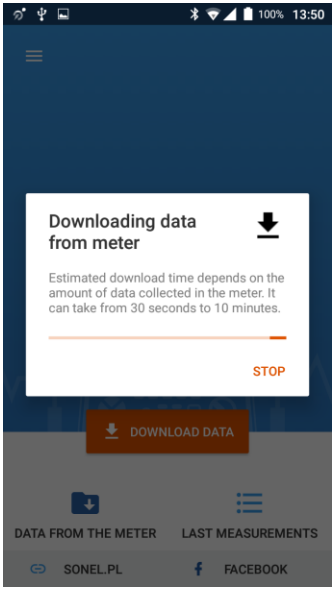

The application collects information about the data stored in the device.

4



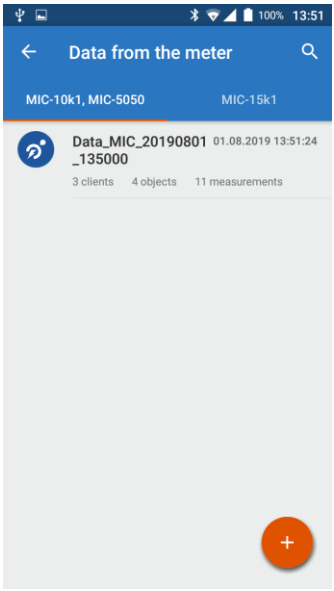

- Enter a name for the package of downloaded data or leave the default name. Hide the keyboard by pressing **'Back'** button in your phone.
- Select data range to be downloaded:
  - ⇒ individual clients or
  - ⇒ all (**Select all**).
- Select **DOWNLOAD**.

5




The application downloads measurement data from the meter.

6



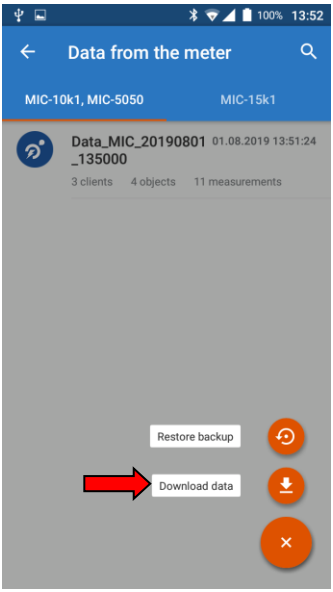

Downloaded data are available in the location **Data from the meter, left** tab.

## 4.2 Method 2

1


- Set the knob of the meter on the position marked as **MEM**.
- On the main panel of the the application, select **Data from the meter.**
- If the knob is in a position other than 'MEM', the meter will not be detected.

2



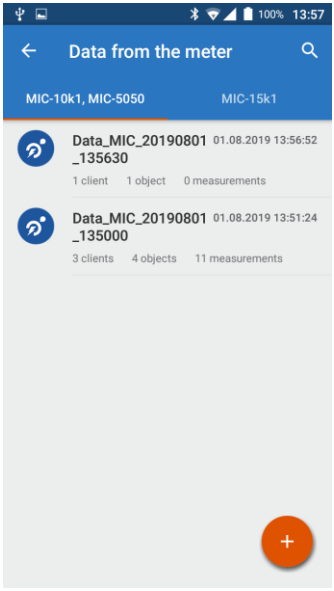

- Select +.
- Select **Download data**.
- Follow as described in **Sec. 4.1** steps (2)(3)(4)(5)(6).

# 5 Data viewing

1


Select **Data from the meter**.

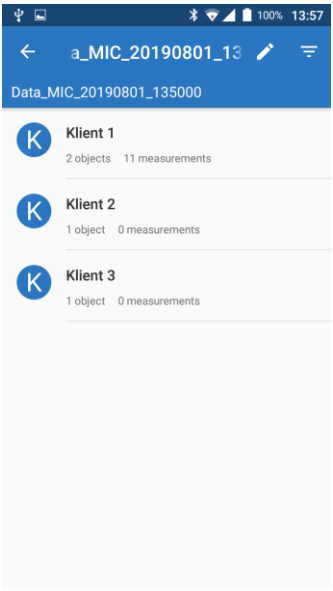
2

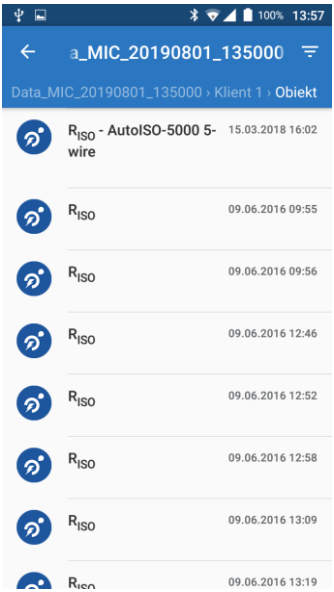



- Select data source.
- Select desired data.
- Each data set in the **left** tab has a hierarchical structure.

**Customers**
**└ Objects**
**└ Measurements**

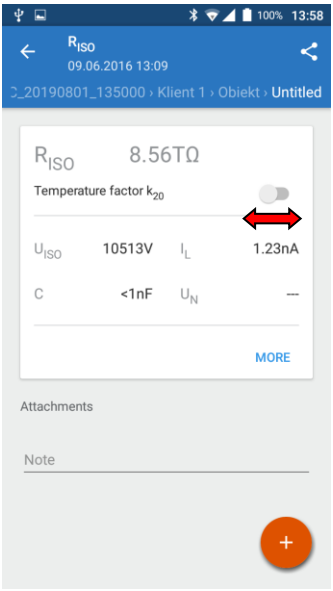
3 Go to the selected measurement.

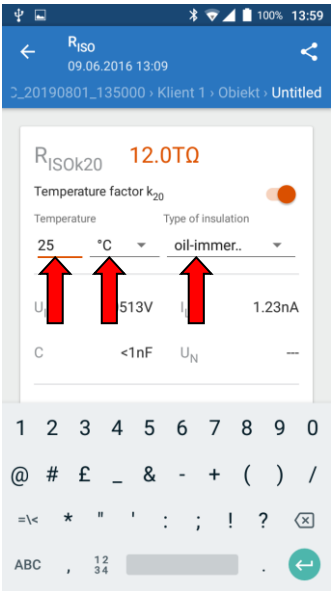



4 The measurement screen shows values measured.

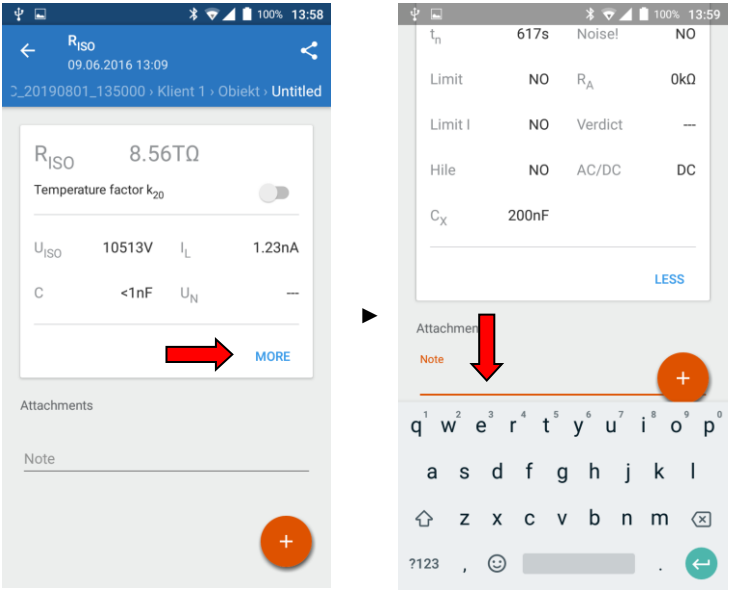
Swipe the slider of **$k_{20}$** parameter to activate the temperature correction of the measurement. You can set the temperature at which the measurement was conducted, and the type of tested insulation. Using this, the resistance is converted to the value that would be measured at 20°C. See also **sec. 7**.



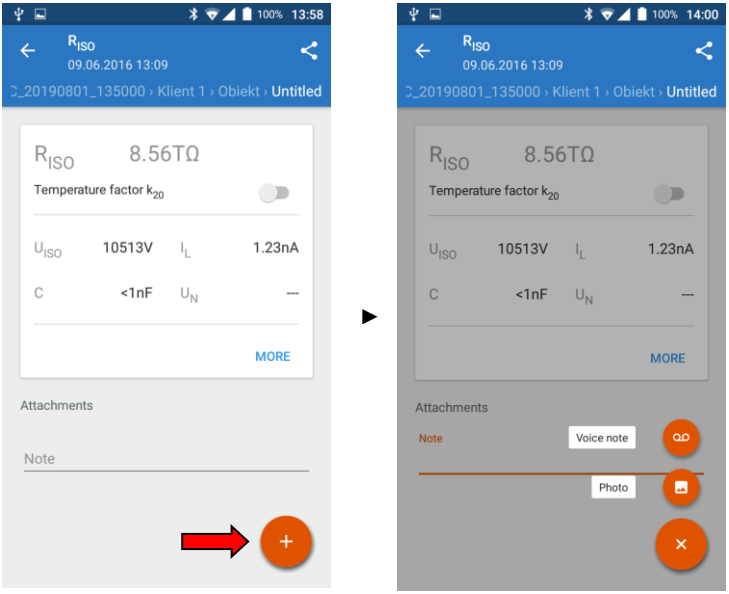



**5** Select **MORE** to see detailed measurement results.

In **Note** field, you can enter a note. Hide the keyboard by pressing **'Back'** button in your phone.




**6** Select icon + to display menu for adding a voice note or image to the measurement.



# 6 Data management

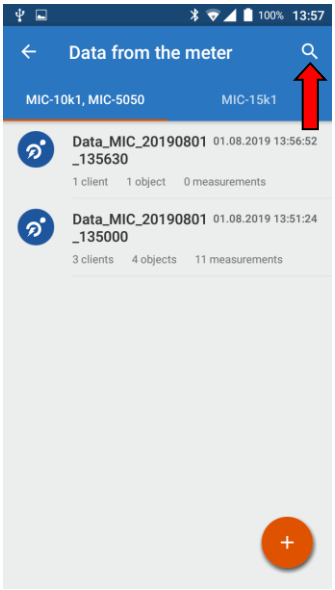
## 6.1 Menu “Data from the meter”

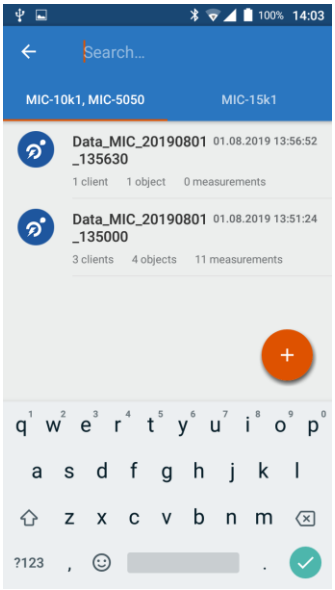
1

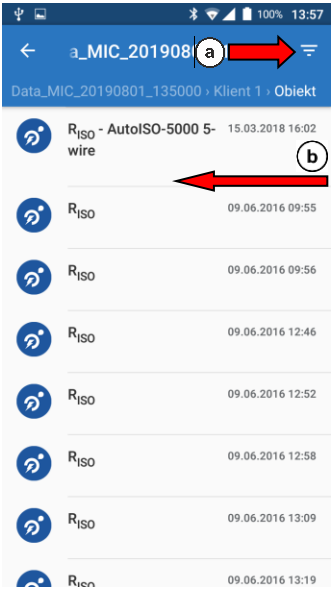

Select **Data from the meter**, and then the data source.

2

Select icon to open a dynamic search of stored data.





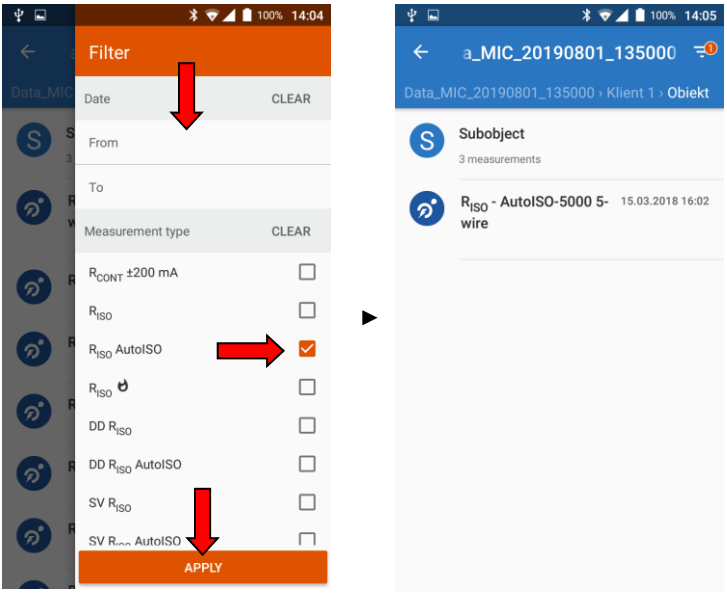

You can filter the data. To do this, display filter list:

(a) select icon or

(b) swipe from the right edge of the screen to the left.

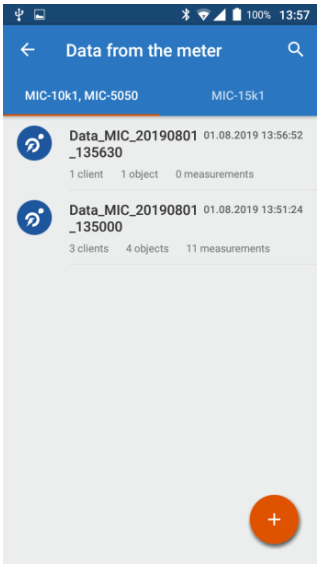
**3**

- Here you can set:
  - ⇒ date range of the measurements,
  - ⇒ type of measured parameters.
- The filters may be cleared by selecting **CLEAR**.
- After choosing filter(s), select **APPLY**.

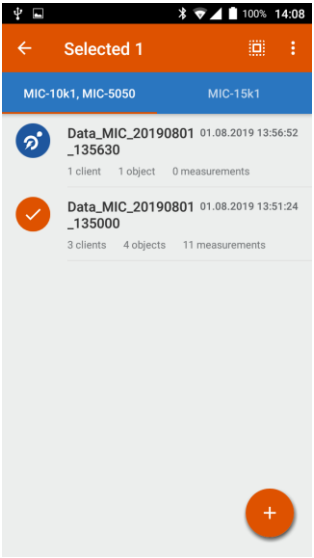


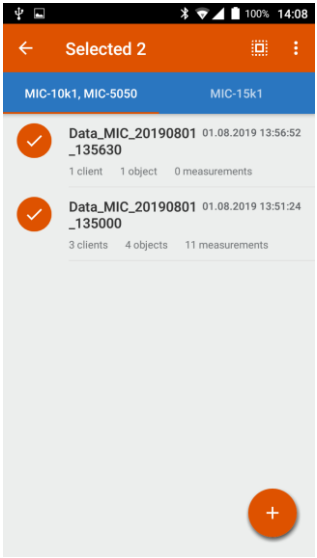
## 6.2 *Data selection*

1. Select **Data from the meter**, and then the data source.

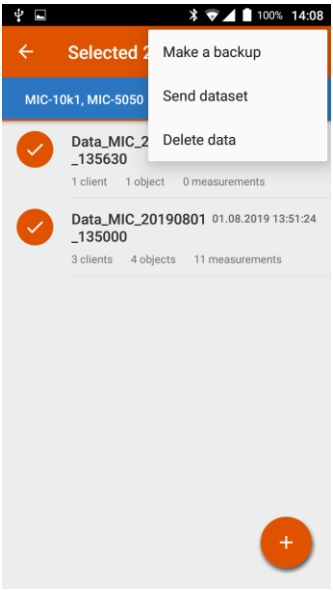

2. Tap and hold the item with data you want to backup.
   - ⇒ If you want to choose more items, just check them.
   - ⇒ If you want to select all, select icon .



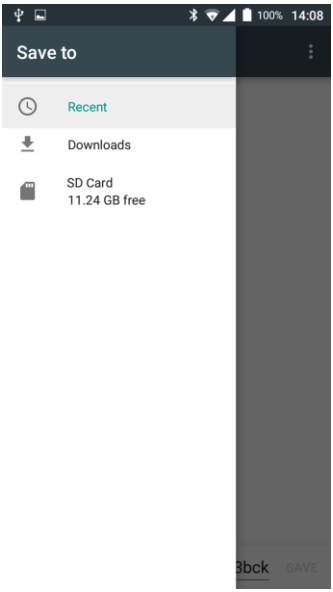
## 6.3 Backup

1




- Select desired items.
- Use icon ⋮ to expand the control menu and select **Make a backup**.

2

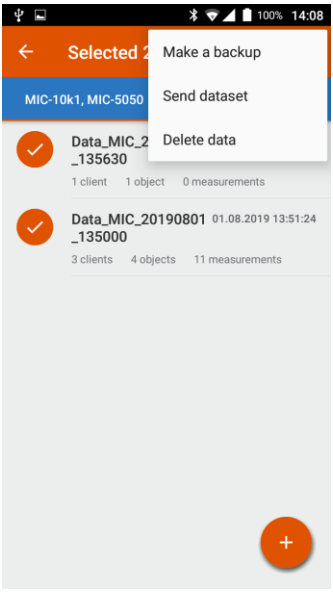



- Select location to save the backup.
- The file will be saved in *.s3bck format.

## 6.4 *Data sharing*

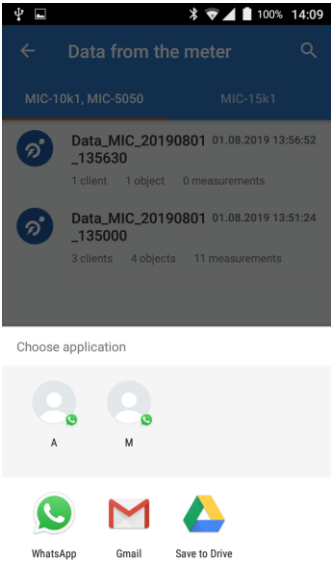
### 6.4.1 Sharing a data set

1




- Select the items you want to share.
- Use icon ⋮ to expand the control menu and select **Send dataset**.

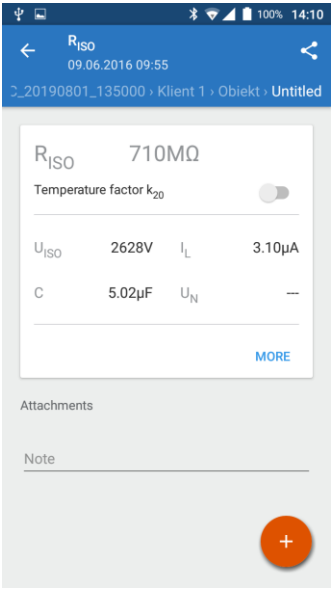
2




- Select application for sharing the data.
- The data will be sent.

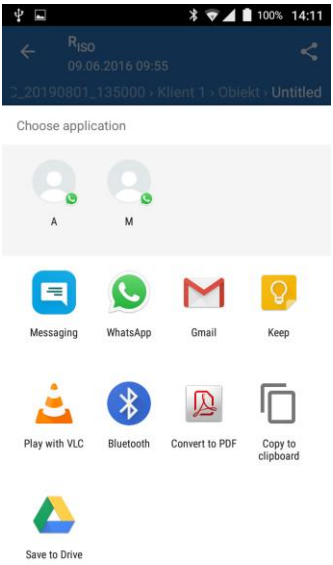
### 6.4.2 Sharing a single measurement

1




- Go to the selected measurement.
- Select icon .

2




Select application for sharing the data.

**3** The data will be sent as text (results from the **left** tab) or in the *.csv format (results from the **right** tab).

RISO

Data_MIC_20190801_135000 › Klient 1 › Obiekt › Untitled

Main result RISO: 710MΩ
UISO: 2628V
IL: 3.10µA
C: 5.02µF
UN: ---
Rt1: ---
Rt2: ---
Rt3: ---
TC: 3563s
T: ---
L: >10000m
Un: 2500V
Ab1: ---
Ab2: ---
DAR: ---
PI: ---
tn: 17s
Noise!: NO
Limit: NO
RA: 0kΩ
Limit I: NO
Test result: ---
Hile: NO
AC/DC: DC
CX: 200nF

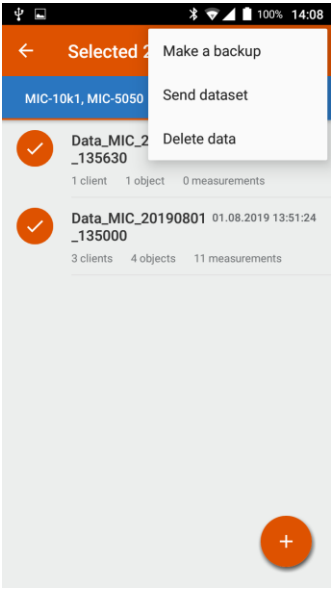
--
Sonel MIC Mobile | created by RST Software Masters

*Results from the **left** tab*

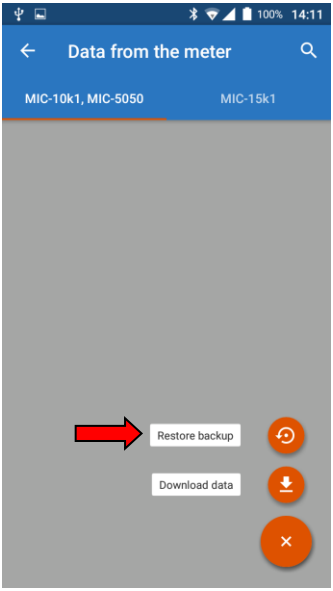

*Results from the **right** tab*

## 6.5 Transferring data between mobile devices

1



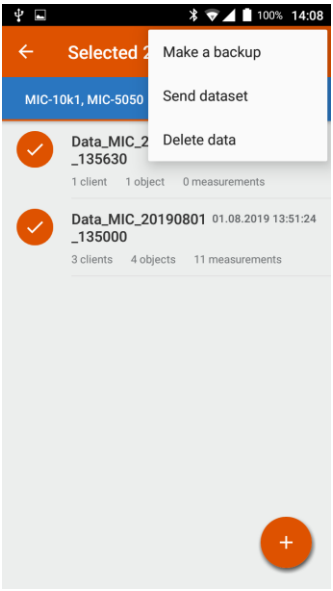

- Make a backup as described in **Sec. 6.3**.
- Move the backup file to the target mobile device.




- In the application on the target device, go to **Data from the meter** menu
- Select +.
- Select **Restore backup**.
- Select the backup file.

## 6.6 Deleting data

1




- Mark the data to be deleted.
- Use icon ⋮ to expand management menu.
- Select **Delete data**.

# 7 Insulation resistance conversion factors

Converting the $R_{ISO}$ measurement value to resistance value at reference temperature acc. to ANSI/NETA ATS-2009 standard.

**Temperature of the measurement in relation to reference temperature**

| Temperature | | Correction factor K | |
|---|---|---|---|
| **ºC** | **°F** | **Oil immersed insulation** | **Solid insulation** |
| -10 | 14 | 0.125 | 0.25 |
| -5 | 23 | 0.180 | 0.32 |
| 0 | 32 | 0.25 | 0.40 |
| 5 | 41 | 0.36 | 0.50 |
| 10 | 50 | 0.50 | 0.63 |
| 15 | 59 | 0.75 | 0.81 |
| 20 | 68 | 1.00 | 1.00 |
| 25 | 77 | 1.40 | 1.25 |
| 30 | 86 | 1.98 | 1.58 |
| 35 | 95 | 2.80 | 2.00 |
| 40 | 104 | 3.95 | 2.50 |
| 45 | 113 | 5.60 | 3.15 |
| 50 | 122 | 7.85 | 3.98 |
| 55 | 131 | 11.20 | 5.00 |
| 60 | 140 | 15.85 | 6.30 |
| 65 | 149 | 22.40 | 7.90 |
| 70 | 158 | 31.75 | 10.00 |
| 75 | 167 | 44.70 | 12.60 |
| 80 | 176 | 63.50 | 15.80 |
| 85 | 185 | 89.789 | 20.00 |
| 90 | 194 | 127.00 | 25.20 |
| 95 | 203 | 180.00 | 31.60 |
| 100 | 212 | 254.00 | 40.00 |
| 105 | 221 | 359.15 | 50.40 |
| 110 | 230 | 509.00 | 63.20 |

$R_{ISOcor} = R_{ISO} * K$

where:
$R_{ISO}$ – measured resistance
$R_{ISOcor}$ – resistance corrected to 20ºC

# 8 Functionality of the app

The functionality of the application varies depending on the version of the meter with which the connection is established.

| Meter | Hardware and firmware version of the meter | Downloading measurement results from the meter's non-volatile memory | Remote control |
|---|---|---|---|
| MIC-5005 | HW B | √ | |
| MIC-5005 | HW B, firmware from v1.30 onwards | √ | √ |
| MIC-5010 | HW D | √ | |
| MIC-5010 | HW D, firmware from v1.30 onwards | √ | √ |
| MIC-5050 | HW A | √ | |
| MIC-5050 | HW B | √ | |
| MIC-5050 | HW C, firmware below v1.46Ca | √ | |
| MIC-5050 | HW C, firmware from v1.46Ca onwards | √ | √ |
| MIC-10k1 | HW A | √ | |
| MIC-10k1 | HW B | √ | |
| MIC-10k1 | HW C, firmware below v1.43Ca | √ | |
| MIC-10k1 | HW C, firmware from v1.43Ca onwards | √ | √ |
| MIC-05s1 | HW A | √ | |
| MIC-05s1 | HW B | √ | |
| MIC-10s1 | HW A | √ | |
| MIC-10s1 | HW B | √ | |
| MIC-15k1 | HW A | √ | √ |
| MIC-15k1 | HW B | √ | √ |
| MIC-15k1 | HW C | √ | √ |

# 9 Manufacturer

The manufacturer of the software and provider of guarantee and post-guarantee services:

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