

TERA Ohmmeter TOM TF 600



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1. Scope of Delivery

TOM 600

- TERA ohmmeter TOM600 with temperature and humidity sensor
- 4 x. NiMH batteries (AA)
- Conductive carrying case with foam insert
- Wall power supply 9V-DC / 500mA
- 2 x teflonized measurement line (1 m)
- PC cable
- CD with PC software and manual
- Manual
- Declaration of factory calibration



TOM 600 ME (incl. measure electrodes):



- TERA Ohmmeter TOM 600 ME with temperature and humidity sensor
- Same as above in addition supplied with:
- Pair of 2,50 kg electrodes according to EOS/ESD S 4.1/S 7.1 and DIN EN 61340 -5-1, -4-1, -2-3 for the measurement of grounding bleeder resistances and point to point measurements, especially for conductive table and floor coverings

2. Description

Due to its compact design and battery powered operation the TOM 600 is suited for mobile applications in industrial areas. Furthermore it can be driven stationary with the provided wall power supply.

The menu-driven TOM 600 is operated by only 2 push-buttons and therefore very user-friendly. All set measurement parameters are shown in the display for a better orientation. Die provided PC software enables you to perform computer driven measurements. In addition the measurement data can be administrated and processed.

The TOM 600 works according to the voltage current measurement principle. The measurement time required by norms, like DIN EN 61340 or EOS-ESD 4.1/6.1, can be set with an internal timer.

While measuring in TIMER=ON mode data, including environment parameters, is stored in the internal EEPROM memory. Thereby the data is maintained and can be read out later via the PC.

As resistance values of some materials depend on air humidity and temperature, these environment parameters are measured and saved together with each measurement value. Thus reproducible measurements can be performed.

3. Operating Instruction

3.1. Start operation

The TERA ohmmeter TOM 600 is shipped with 4 AA batteries and is therefore plug-and-play. For charging the batteries only the provided wall power supply may be used.

For measuring the electrodes have to be connected to the appropriate connectors (q.v. legend) and positioned on the object to measure. Afterwards button «B» has to be pressed to power the device on.

Please pay attention moving on measurement lines and passing people as they can cause electrostatic induction at the measurement input.

After powering on the software version is displayed:

TOM 600 V3.1
(c)KE/ 09.2004

In case of set measurement time the device prompts to press button «B». Afterwards the current resistance value and the timer settings are displayed. If the timer is not set, the device immediately returns:

R>2.0xE12Ω* T=OFF**
Air: xx°C xx%r.F

* Mathematical representation or technical representation $> 2T\Omega$

* * Alternating to the timer display T=OFF is shown the measure voltage mode: Auto, 100V or 10V

Press button «B» to power the device off. In battery mode the device powers off automatically after 5 minutes when no button was pressed.

3.2 Charging the NiMH Battery

The provided wall power supply has to be used to charge the batteries or operate the TOM 600.

For this the jack must be connected to the power supply. If the charging works properly the green indicator LED is lit. The charging time for the provided batteries is max. 14h. Longer charging has to be avoided as batteries can be overcharged and damaged.

The TOM 600 can be operated up to 12 hours with fully charged batteries.

3.3 Measure range and measure voltage

The TOM 600 provides an automatic range selection over the entire measurement range. The device selects the measurement range according to the connected resistance.

- Measured resistance less than 200 k Ω — Measure Voltage 10 VDC
- Measured resistance more than 200 k Ω — Measure Voltage 100 VDC

The automatic range selection can be turned off in the setup. A fixed measurement voltage can be set.

4. „Set-up“ Function

By pressing button «A» for about 2 seconds the setup menu is loaded. The device displays:

**SET TIMER !
TIMER ON/OFF**

By pressing button «B» (Change) the timer can be switched on and off. If button «A» is pressed while the display indicates OFF, the timer is turned off. Read on at section 4.1. If button «A» is pressed while the display indicates ON, the measurement time can be set up next and the device displays:

**NEW TIMER !
TIME = 001 s**

By pressing button «B» the measurement time is changed as follows:

1s, 2s ... 10s, 15s, ... 60s, 120s, ... 240s, 1s

Press button «A» to confirm the measurement time shown in the display. The device returns:

**TIMER MODE :
AVERAGE (LAPSE)**

The measurement mode can be switched between the average over the whole measurement time (AVERAGE) or the last value at the end of the measurement (LAPSE) by pressing button «B». The displayed mode can be confirmed with button «A».

Afterwards the device prompts whether the data stored in the EEPROM (files) should be deleted:

**DEL FILES ?
YES / NO**

Pressing button «B» switches between YES and NO. The selected action is confirmed by pressing button «A». If all data is erased the saving will start on File No. 001 the next time. The display returns:

FILES DELETED !

4.1 Measure Voltage / Display Mode

After finishing section 3 the measurement voltage and the display mode can be set up. First the device prompts for the measurement voltage:

**VOLTAGE MODE :
AUTO**

(MAN.10V) (MAN. 100V)

By multiply pressing button «B» you can choose between the following options:
AUTO, MAN. 10V, MAN. 100V, AUTO, ...

Press button «A» to confirm the displayed function. Afterwards the number representation is prompted:

**DISPLAY MODE :
R>2.0xE12**

(R>2.0 T?)

By pressing button «B» you can switch between scientific and engineering representation. The selection can be confirmed by pressing button «A».

If the timer is set off continue reading in section 4.2.

Afterwards the device is reset and returns in case of activated timer:

T=xxxs Avg Auto
PRESS START !

(Lap) (+10V, +100V)

The next measurement can be started by pressing button «A». The time T decrements in steps of 1s, by reaching 0 the measured resistance value is displayed with the amendment Avg for AVERAGE or Lap for LAPSE. The second line shows the measured temperature and humidity values, e.g:

Avg = 2.5xE9
AIR: xx°C xx%r.F

(Avg = 2.5 G?)

Alternating with the temperature and humidity values the second line shows every 2s:

Avg = 2.5xE9
FN:xxx T=xxxs

By pressing button «A» the measurement result, including temperature and humidity values, can be saved using the displayed file number. Stored data can be read out via the PC interface later.

4.2 Timer

In case of not activated timer the TOM 600 switches automatically to a live display of the measured resistance value. The device returns e.g.:

Example:

R=5.5xE10Ω T=OFF <-> AUTO
AIR: xx°C xx%r.F

5. Other Display Information

In case of exceeding the maximal measurement range, the device returns in the first line:

Measure voltage = Auto, 100V

R>2.0xE12? (R>2,0 T?)

Measure voltage = 10V

R>2.0xE11? (R>200 G?)

In case of undercutting the minimal measurement range, the device returns:

Measure voltage = Auto, 10V

R<2.0xE04? (R<20 k?)

Measure voltage = 100V

R<2.0xE05? (R<200 k?)

In case of changing resistance values the device searches the proper measurement range and returns:

WAIT !

If the battery voltage undercuts 4,6 Volt, the display's second line alternates with:

LOW BATTERY !

The battery has to be charged, though the current measurement can be completed. If the battery voltage undercuts 4,3 Volt, the device powers automatically off to prevent battery drain after displaying:

**BATTERY EMPTY !
AUTO SWITCH OFF !**

5.1 Display contrast

On the device top side the display contrast can be adjusted with a tiny screw driver through a small hole.

6. PC – Operating

6.1 System requirement

- PC with 486 CPU or higher
- USB port
- Windows XP, Windows 7/8

6.2 Installations

- Insert the CD in a free CD drive
- 32-bit system, install KE_setup_X86
- 64-bit system, install KE_setup_X64
- Follow the installation instructions of the program

6.3 Start the Software

Connect the TERA-Ohmmeter to the computer with the included USB-cable. Then turn on the TERA – Ohmmeter.

Windows will automatically install the driver (USB-Serial-Converter).

Click on the KE_read_out icon. The software will start automatically.

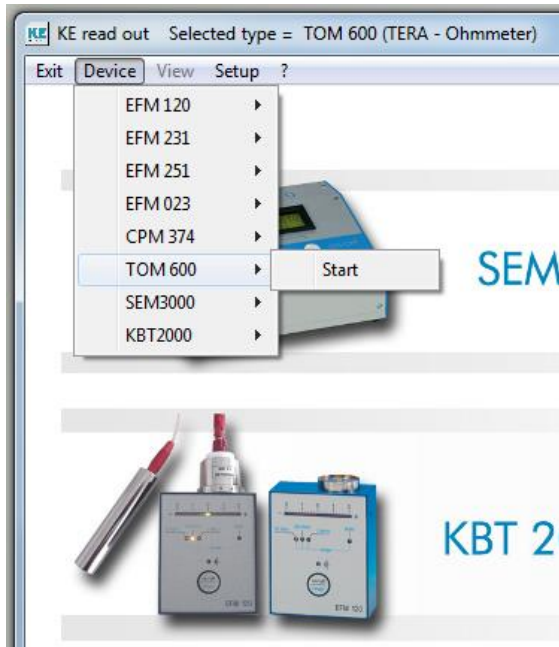
Setup → select Com Port .

MANUAL

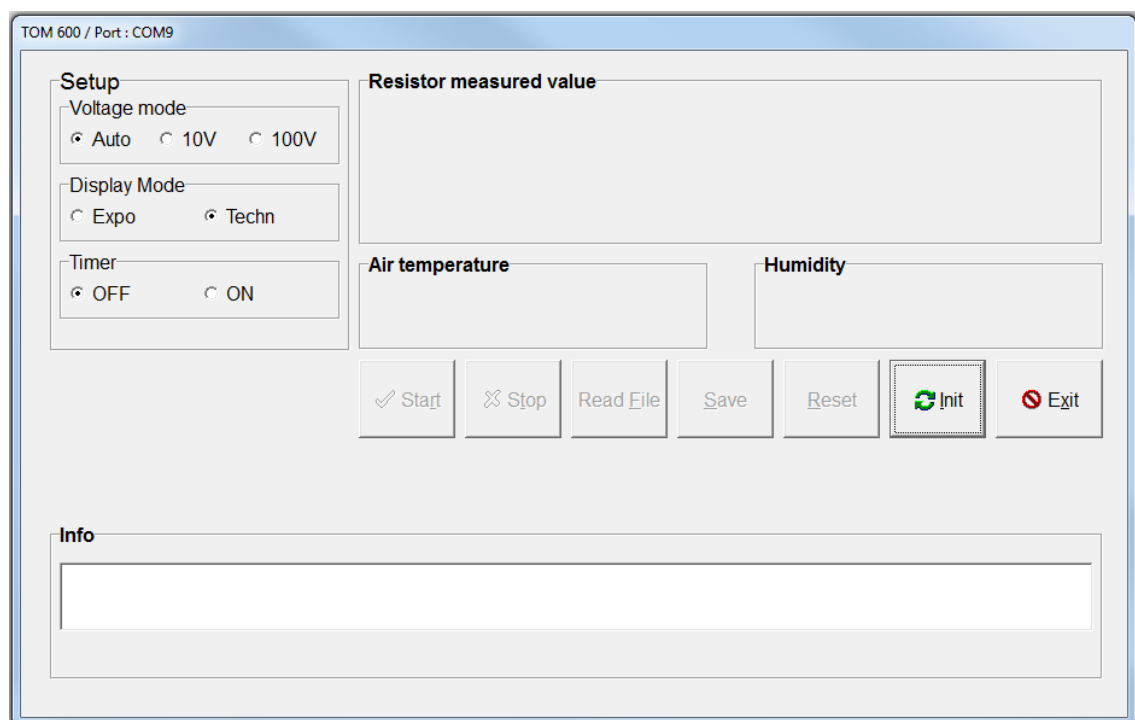
Version: 10.07.2017_V.2.3

6.4 Operation of the software

Device → TOM 600 start



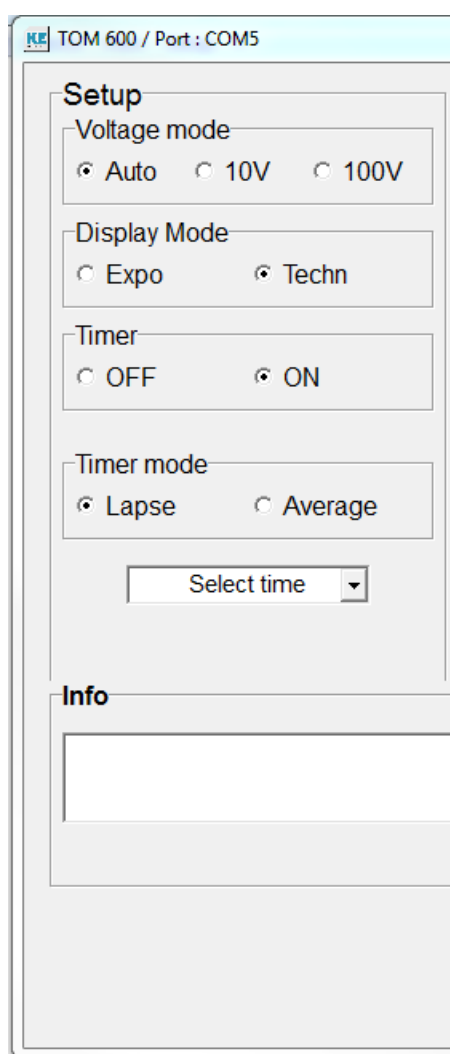
Init → First must be performed an initialization



Then in the info window, the device data are displayed



Setup → In the setup, the parameters can be set
at timer = On will open another window for timer settings



Start → start a new measurement. The results are displayed.

The screenshot shows the TOM 600 software interface. At the top left, it says 'TOM 600 / Port : COM9'. The interface is divided into several sections:

- Setup:** Contains three sub-sections:
 - Voltage mode:** Radio buttons for 'Auto' (selected), '10V', and '100V'.
 - Display Mode:** Radio buttons for 'Expo' and 'Techn' (selected).
 - Timer:** Radio buttons for 'OFF' (selected) and 'ON'.
- Resistor measured value:** A large box displaying '36.6 kOhm'.
- Air temperature:** A box displaying '26 °C'.
- Humidity:** A box displaying '35 %r.F.'.
- Buttons:** A row of seven buttons: 'Start' (green checkmark), 'Stop' (red X), 'Read File' (document icon), 'Save' (floppy disk icon), 'Reset' (circular arrow), 'Init' (green circular arrow), and 'Exit' (red circle with X). Below the 'Stop' button is a small text label 'Stop measurement'.
- Info:** A box at the bottom containing the text: 'SW version : 3.29 / Serial number : 07140512 / Calibration date : 15.05.2012'.

Stop → Pauses the current measurement at timer = ON ReadFile => The manually stored values can be read here.

After that a window will open where each measured value a comment can be inserted. With Save the results saved in a "csv" file. (When you save the same file, the results are written below each other)

Reset → produces a "Reset" on the Ohmmeter

Save → saves the current measurement result with the possibility to insert a comment in a "csv" file.

Exit → ends the TOM-600 Mode

7. Warranty

In case of proper use we issue warranty within 24 month after shipping. Mechanical damage and the batteries are exempted from the warranty. Warranty is void on opening the device.

8. Technical Specifications

Dimensions:	Plastic Housing 223 mm x 81,5 (106) mm x 40 (59) mm (L x B x H)
Weight:	350 g.
Display:	alphanumeric Display, 2 lines with 16 digits, size: 60 mm x 25 mm
Measure Ranges:	Resistor 20 k Ω - 2.0 T Ω Tolerance \pm 1xEXX Ω Temperature 0°C....60°C Tolerance \pm 3°C Rel. Humidity 10%...90%r.F. Tolerance \pm 5%
PC-Interface:	Serial interface, internal COM – USB Adaptor
PC-Software:	KE-ReadOut Software
Battery:	4 x AA-NiMH 2100 mAh Operation time with fully charged battery: > 12 hours permanent operation Charging time with provided wall power supply: max. 14h
Power Supply:	9V-DC / 300 mA (operating only with inserted BATTERIES!)

9. Safety Advice

The TOM 600 is not approved for measurements in explosive areas. Operation in power plants is not permitted.

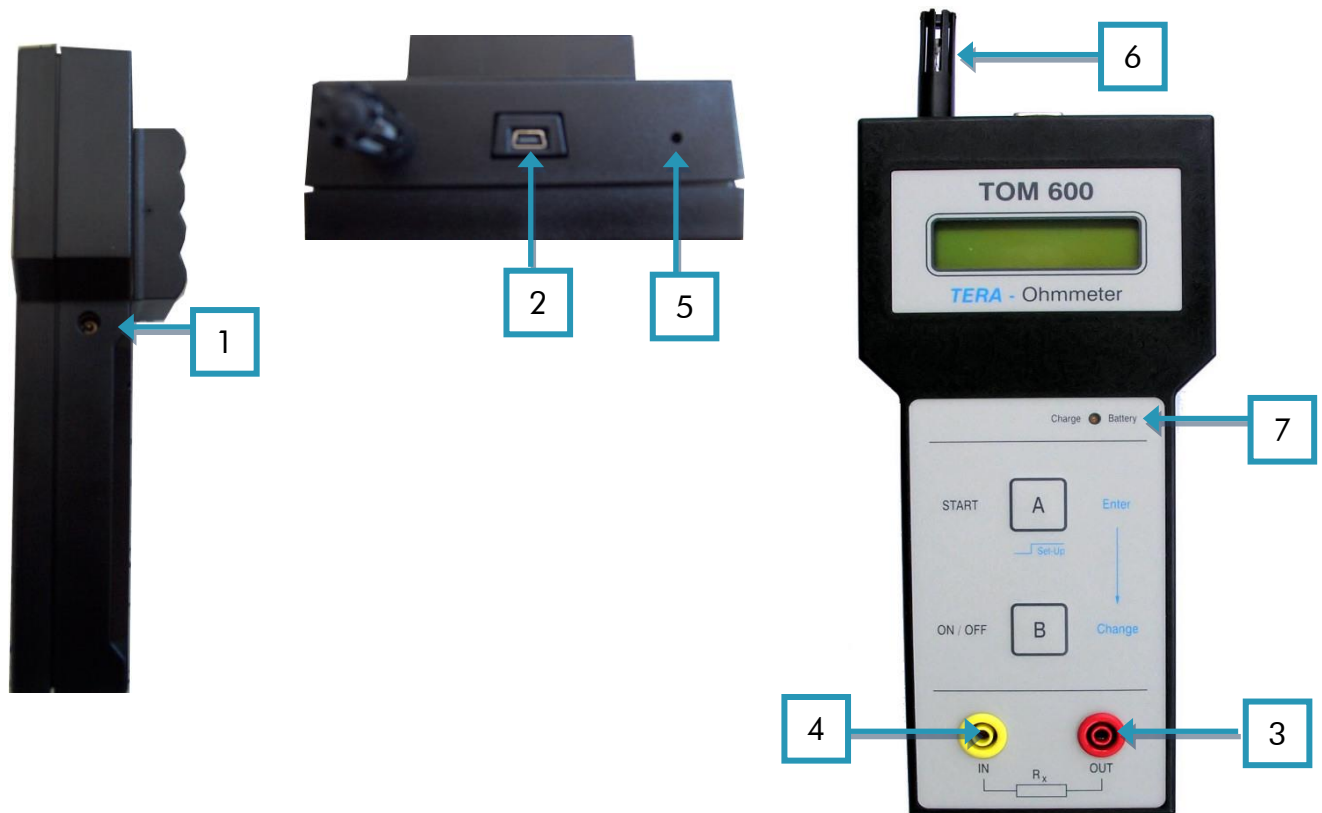
Notice: Please make sure the object to be measured is potential free before every measurement. External voltage can distort the measurement results and damage the instrument.

10. Maintenance / Calibration

The device is maintenance-free. If the device is contaminated it can be cleaned by using a non-fuzzing cotton cloth and solvent-free cleanser. The device must not be opened. On opening the device warranty is void. If the device is not used for longer terms batteries should be removed. Always store batteries charged.

The recommended factory calibration interval is 1 year.

11. Legend



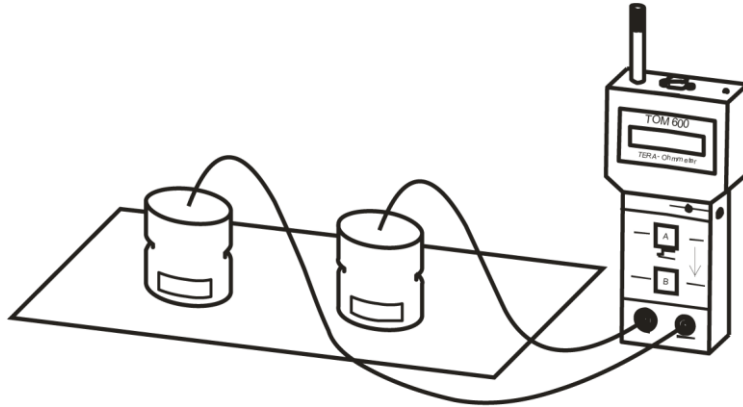
1. Power Supply connector 9V DC
2. USB – Interface
3. Measure Voltage Output
4. Measure Input

5. Contrast – Potentiometer for LC Display
6. Temperature / Humidity - Sensor
7. Charge control LED

12. Measuring Techniques

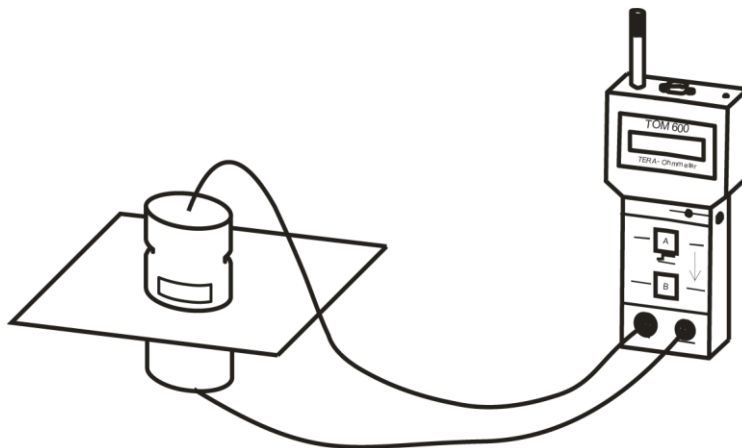
12.1 Surface Resistance (point to point)

The electrodes have to be put on the covering to measure. The measured resistance depends on the conductivity, the surface condition and the distance between the electrodes.



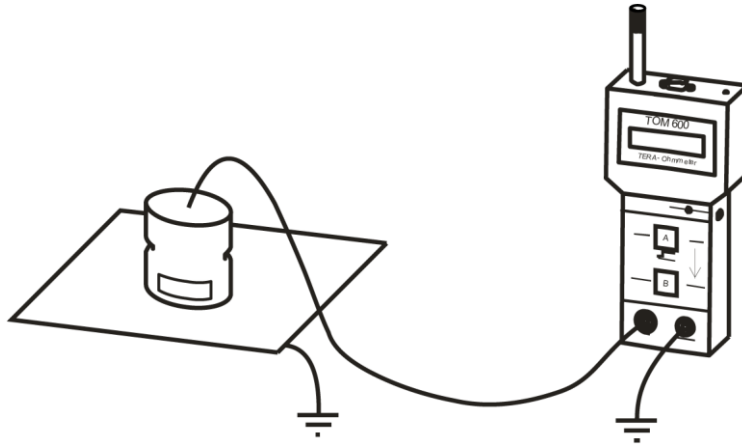
12.2 Volume Resistance

The covering has to be put between a metal plate and one electrode or between both electrodes. The measured resistance depends on the conductivity, the materials thickness and the surface condition.



12.3 Leakage Resistance (point to ground)

The resistance of a covering to ground potential is measured. The measured resistance depends on the material's conductivity, its surface condition, the electrodes distance to the grounding point and the quality of the grounding.



A ring measurement electrode for measurements according to DIN EN 61340-2-3 is available as accessory

13. Contact addresses, contact persons and service

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