



- ✓ Ohmic resistance (Rel)
- ✓ Charge-Transfer Resistance (Rct)
- ✓ DC voltage measurement:
  - ±2.45 VDC (Res. 0,00001V)
  - ±24.5 VDC (Res. 0,0001V)
  - ±600 VDC (Res. 0,001V)
- ✓ Stores up to **300000 sets** of data
- ✓ **Automatic data capture.** Upload of a complete battery database.
- ✓ **RF-ID**, wireless battery identification with the use of unique transponder tags.
- ✓ Direct connection of **DMA35 V3** or **V4** density probe.
- ✓ **BLUETOOTH** - Interface for data transfer and headset integration.
- ✓ **10 hours** of continuous operation

## Mobile Battery Tester

# TMC – 2001RTS

The **TMC-2001RTS** is a universal, multifunctional test device for the user-friendly and professional maintenance of battery systems. The meter is designed for safe and mobile on-site use. It has very small dimensions and can be clipped to a belt.

The measurement acquisition is perfectly supported by uploading of a complete database of battery installations into the unit and the use of a RF-ID transponder system.

The **TMC-2001RTS** logs the voltage, ohmic and electrochemical resistance of a battery block in one step. The measurements of the temperature and electrolyte density (optional sensors) complete the extensive possibilities for examination the condition of a battery system.

## Analog section

	Range	Resolution
Block voltage	± 24,5 VDC	0,1 mV
Total voltage	± 600 VDC	1 mV
Aux. voltage	± 2,45 VDC	0,01 mV
Resistance	1000 mΩ	10 μΩ

## Interfaces

- IrDA (for density meter DMA35 V3)
- Bluetooth (Classic)
- RF-ID Transponder System

## Software

A complete battery management software, CS-Manager, is included.

The CS-Manager software is based on a SQL-Database. As an option, this database can be installed on a central server.

## Delivery Scope

- **TMC-2001RTS** data logger
- Battery charger for RTS
- One pair of test leads (4-wire)
- Batterie Management PC Software, as download.
- Transport case

Dimensions (L x W x H)  
96mm x 154mm x 33mm

## Measuring method

In contrast to simple test devices, the **TMC-2001RTS** loads the battery with a superposition of ramped current pulses. During testing, this current can produce a controlled current change of up to 2 A within 0.5 milliseconds up to 0.5 seconds. The internal resistance is

calculated from the resulting voltage profile. For this purpose, several highly accurate, synchronous A/D converters are integrated in the system.

**A special feature is the simultaneous measurement of the ohmic resistance and the charge transfer resistance.**

The **ohmic resistance** is the pure electrical loss. These losses occur at the pole bridges, grids, the electrolyte... This resistance indicates the ability of a battery to provide temporally rapidly varying currents, e.g. for clocked DC / DC converters. The ohmic resistance is one part out of the DC-resistance.

The **charge transfer resistance** is an electrochemical indicator, showing the ability of the charge transfer while charging or discharging. **R<sub>ct</sub>** increases while charging and decreases under discharge. This resistance can cause an insufficient charge of a battery block, or limit the expected DC discharge current. It is always a good idea to evaluate this parameter. These two resistors are in series and form together the DC resistance of a battery. **This resistance indicates the ability of a battery to deliver a DC current.** In this case, not only the ohmic resistance should be tested alone.

This shows that pure ohmic resistance testers (impedance testers from approx. 500 Hz upwards) only identify about half of the faults in a battery. **Electrochemical deficits are not discovered at all.** Testers with low frequency (about 10-60Hz), measure a mixture of these resistors and are usually not able to identify errors exactly.