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## TECHNICAL PRODUCT INFORMATION

### Test & measurement instruments

- ▶ high - quality
- ▶ moderate prices
- ▶ excellent precision

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# Measurement Module Battery Test MBT-x

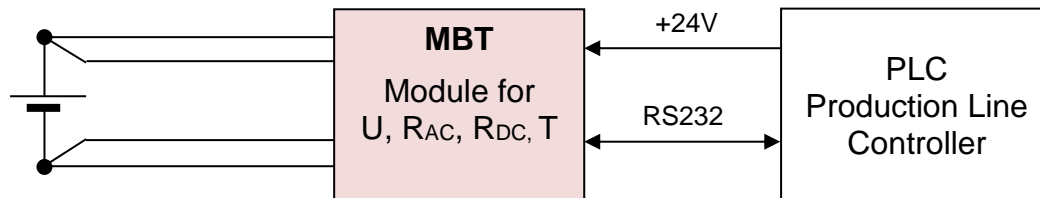
## Description

The MBT-x is a measurement module for production and quality assurance of batteries. It is optimized for the quick test of battery cells and modules and for checking welding joints in EoL-tests.

It measures 3 key battery parameters (AC internal resistance, DC internal resistance and battery voltage) within 0.4sec. An additional mode allows for automatic temperature compensation.

In addition to the 4-wire measuring technology, a 6-wire arrangement is also provided to facilitate the wiring.

The measurement module is protected by an aluminium housing which can be mounted by 4 screws. It is remotely controlled via RS232 communication interface and powered by a separate power supply.



## Features

- Switchable resistance range allows welding tests.
- 3-parameter measurement within 0.4sec
- Measuring battery voltage with high accuracy ( $\pm 1\text{mV}$  for cells)
- Measuring the battery internal resistance (ohmic part) at 2 frequencies (10Hz, 1kHz)
- Test connection in 4-wire technology or in 6-wire technology with compensation current
- Measuring temperature with temperature compensation of the 10Hz measurement
- Cycle time can be further reduced by parallel operation

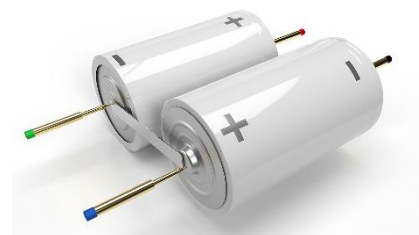
## Applications

### Incoming inspection

- Ensuring the homogeneity of cells
- Classification/grading of cells
- Elimination of outliers

### End-of-line test

- Cell/module test
- Testing of welding joints



## Versions

	MBT-L	MBT-S	MBT-M
Application	Large cells	Small cells	Modules
Voltage range / V	0...5	0...5	0...60
Resistance ranges / mΩ	1 / 3 / 10	(1 / 3) <sup>1</sup> 10 / 30 / 100	(10) <sup>1</sup> 30 / 100 / 300
Polarity independent	no	yes	no

## Technical Data

Parameter	Value
Measurement time	<0.4sec for 3 parameters U, R <sub>1kHz</sub> , R <sub>10Hz</sub> <0.5sec for 3 parameters U, R <sub>1kHz</sub> , R <sub>10Hz</sub> , temperature
Measurement principle	Internal resistance, discharging method
Internal resistance range (switchable)	MBT-L: 1mΩ, 3mΩ, 10mΩ MBT-S: (1mΩ, 3mΩ) <sup>1</sup> , 10mΩ, 30mΩ, 100mΩ MBT-M: (10mΩ) <sup>1</sup> , 30 mΩ, 100mΩ, 300mΩ
Measurement current	MBT-L: 2A <sub>SS</sub> ; MBT-S: 200mA <sub>SS</sub> ; MBT-M: 200mA <sub>SS</sub>
Measurement frequencies	1 kHz and 10Hz
Minimum Voltage	1 V (for internal resistance measurement)
Resolution	0,01μΩ
Measurement uncertainty	±0,5% o.d. ±0,2% o.r. ±5μΩ (0...40°C) ±0,4% o.d. ±0,2% o.r. ±5μΩ (23±5°C)
Voltage meas. range	0...±5V / 0...±60V
Resolution	1μΩ
Measurement uncertainty	±0,03% o.d. ±0,005% o.r. (0...40°C) ±0,01% o.d. ±0,005% o.r. (23±5°C)
Temperature measuring range	0°C...60°C
Resolution/uncertainty	0,1°C/±1°C with RTD sensor class B (F 0,3°C)
Communication interface	RS232, galvanically isolated, 19.200Bd USB via separate RS232-USB-converter (not included)
Monitoring	Protocol: contact failure, out-of-range LED: power supply and communication
Power supply	RS232: 8V...32V, typ. 10mA, max. 15mA Device: 8V...32V, 1W; (80mA @ 12V, 40mA@24V)
Operating temperature	0°C...+40°C
Connection plugs	Pin connector Würth Series 368B, WR-TBL
Dimensions, weight	Aluminium housing 80x43x146mm (WxHxD), ca. 350g

Explanation: o.d. = of display; o.r. = of range

<sup>1</sup> Higher measurement uncertainty