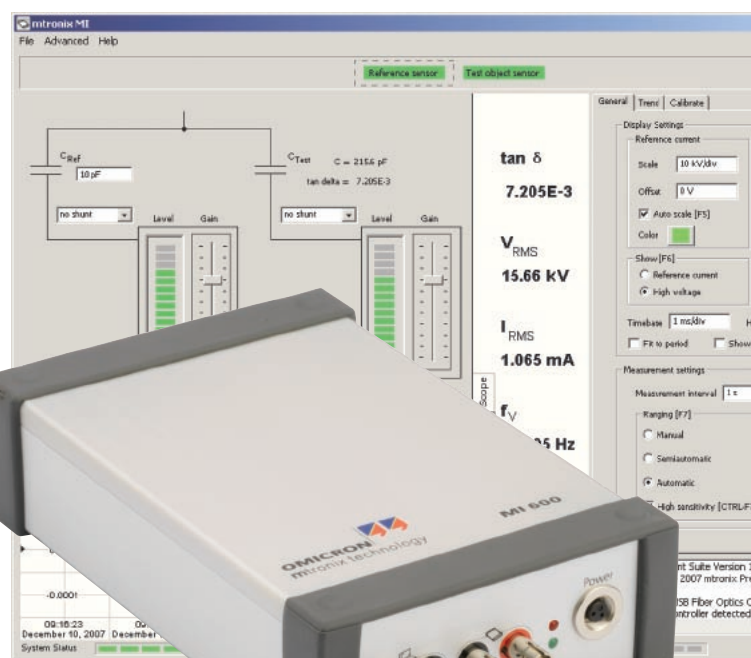




**OMICRON**  
mtronix technology

# M1 600

HIGH-PRECISION ACQUISITION AND  
ANALYSIS SYSTEM FOR  
DISSIPATION FACTOR AND  
CAPACITANCE MEASUREMENT



# Technical Specifications

The MI 600 universal current measuring system is a high-precision, modular acquisition and analysis system for gauging current and key characteristics of high-voltage equipment, including dissipation factor and capacitance. Complete electrical insulation between acquisition units and the control PC provide superior safety in high-voltage setups. High-resolution digital processing enables exceptional measurement precision. The easy-to-use control software features various real-time visualization and monitoring options, and integrates with multiple mtronix products.

## System Features

- Modular, compact design. The MI 600 consists of two acquisition units, a fiber optics controller, and a PC. USB 2 technology allows for plug-and-play with any recent desktop, rack-mount, or laptop computer.
- Complete electrical insulation between the acquisition units and the control station is achieved by means of optical fibers, each of which can be up to 2 km in length. This guarantees unprecedented safety and flexibility.
- Maintenance-free operation. No controls are present on the acquisition units. All functions are available under remote control from the software.
- Superior precision and performance. The MI 600 features latest digital technology and advanced software design. High-speed and high-resolution A/D converters coupled with sophisticated digital processing algorithms deliver outstanding accuracy.
- Low power consumption. Optimized for battery operation due to a power consumption of less than 4 W in measuring mode. In standby mode, each acquisition unit consumes less than 10 mW.
- Wide input range. The MI 600 features an 11-level input gain control that is adjustable via the control software. Its high-sensitive input reliably resolves currents as low as 20  $\mu\text{A}$ . An on-board shunt, automatically deployed under software control, enables input currents of up to 100 mA to be directly measured without the need for an external shunt.

## Specifications Acquisition Unit

Material	Extruded Aluminum
Dimensions	110 mm (W) x 190 mm (D) x 44 mm (H)
Power Supply	9 – 12 V DC, Max. Power Dissipation: 4 W (Standby < 10 mW), External Plug-in Power Supply (Input Range 100 – 240 V, 50 – 60 Hz) and battery pack included (Lithium Ion Battery 11.2 V / 4.8 Ah)
Controls	None, All Functions Fully Remote-controlled
Indicators	2 x LED: Stand-by/Power, Optical Fiber Data Integrity
Fiber Optic Connectors	2 x ST, Using Multi-mode Fiber 50 / 125 $\mu\text{m}$ (up to 2 km in Length)
Input Connector	1 x TNC
Temperature	0 °C ... 45 °C (Operating), -10 °C ... 60 °C (Storage)
Humidity	5 % ~ 80 % Non-condensing
Input Frequency Range	5 Hz – 50 kHz
Input Impedance	50 Ohms
Input Current Range (direct)	20 $\mu\text{A}$ – 100 mA rms
External Shunt Availability	4 A, 15 A, 28 A

## MI 600 System Data

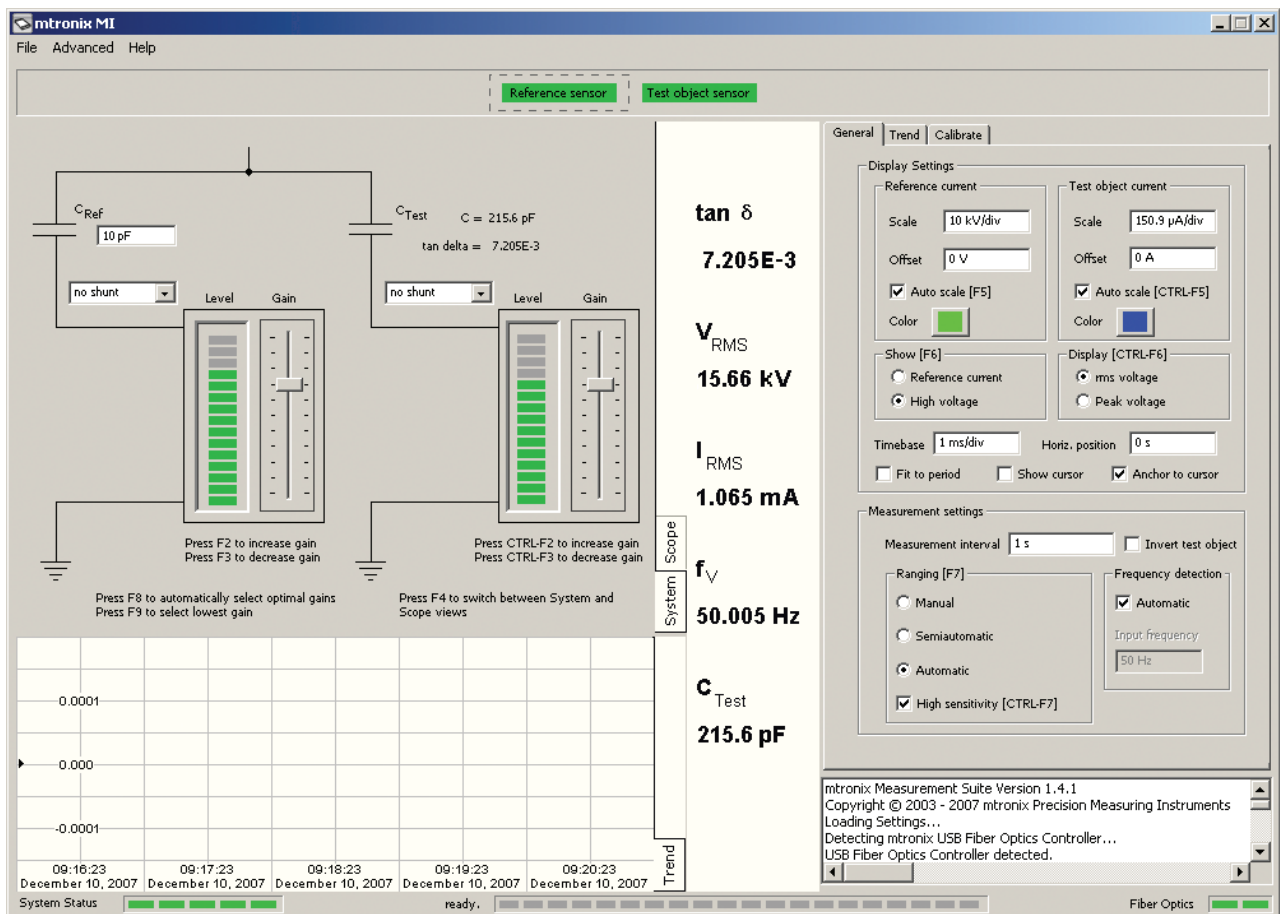
Dissipation Factor Display Range	0.001E <sup>-5</sup> ... $\infty$ (Absolute)
Dissipation Factor Resolution	0.00001
Test Object Capacitance Display Range	0.1 pF ... 50 $\mu\text{F}$
Test Object Capacitance Resolution	0.1 pF
Measurement Interval	300 ms
Reference Capacitance Range	10 pF ... 10 nF (Recommended Value: 100 pF)

## Measurement Accuracy

Dissipation Factor	$\pm (2 \% \text{ of Display Value} + 2E-5)$
Test Object Voltage	$\pm 0.5 \% \text{ of Display Value}$
Test Object Capacitance	$\pm 0.25 \% \text{ of Display Value}$
Frequency	$\pm 0.0025 \% \text{ of Display Value}$

## MI 600 Software

Operating System	Microsoft® Windows 2000 Professional, XP or VISTA
Hardware Requirements	Intel® Pentium® 4 ( $\geq 2.5$ GHz), Pentium® M ( $\geq 1.5$ GHz), Core™ or Core™ 2 processor; or AMD Athlon™ 64 or Turion 64 processor; 512MB RAM (1GB RAM recommended); USB 2.0 compatible
Data analysis	Real-time, simultaneous oscilloscope-like display of current, on-line computation and display of key electrical quantities (dissipation factor, voltage, current, frequency, capacitance), trend display of quantities
Data storage	Automatic hard-disk storage of selectable measurement quantities, recorded every 300 ms Manual hard-disk storage of selectable measurement quantities



## Ordering Information

MI 600-2 Dual-Channel TanDelta Measurement System [VE004400]	2 x measurement unit MI 600, controller unit MCU 502 with USB cable, precision shunt 4A, basic SW package, user manual, fiber optic cables, measurement cables, power supplies, batteries and charger
Separately available accessories	4 A precision shunt [VEHZ4112], 15 A precision shunt [VEHZ4114], 28 A precision shunt [VEHZ4113] MPP 600 Li-Ion power pack set [VEHZ4105], MPP 600 Li-Ion battery, 11.2 V / 4.8 Ah [VEHZ4106], mtronix business trolley MBT 560 (aluminum) for 600 series [VEHP0040]



**OMICRON** is an international company serving the electrical power industry with innovative testing and diagnostic solutions. The application of OMICRON products provides users with the highest level of confidence in the condition assessment of primary and secondary equipment on their systems. Services offered in the area of consulting, commissioning, testing, diagnosis, and training make the product range complete.

Customers in more than 130 countries rely on the company's ability to supply leading edge technology of excellent quality. Broad application knowledge and extraordinary customer support provided by offices in North America, Europe, South and East Asia and the Middle East, together with a worldwide network of distributors and representatives, makes the company a market leader in its sector.

With its policy of pioneering development OMICRON continues to lead the field in creating solutions to meet the needs of 21st century customers.

**mtronix**, part of the **OMICRON** group, was founded in 1997 in Berlin as a spin-off from the Technical University Berlin. By then the specialized team had already gathered a long experience of research in the field of sophisticated electronic measuring systems for astronautics, power and medical engineering.

Outstanding features of the **mtronix** platform are the extremely energy-saving design together with the mtronix optical network technology. This allows multiple fully synchronous measurement instruments to be separated by large distances (up to 2km between any two measurement instruments) without sacrificing measurement accuracy while also providing complete electrical insulation between connected measurement instruments.

## OMICRON Sales Service Centers

### Europe, Middle East, Africa OMICRON electronics GmbH

Oberes Ried 1  
A-6833 Klaus, Austria  
Phone: +43 5523 507-0  
Fax: +43 5523 507-999  
info@omicron.at  
www.omicron.at

### North and South America OMICRON electronics Corp. USA

12 Greenway Plaza, Suite 1510  
Houston, TX 77046, USA  
Phone: +1 713 830-4660  
1 800-OMICRON  
Fax: +1 713 830-4661  
info@omicronusa.com  
www.omicronusa.com

### Asia, Pacific OMICRON electronics Asia Limited

Suite 2006, 20/F, Tower 2  
The Gateway, Harbour City  
Kowloon, Hong Kong S.A.R.  
Phone: +852 2634 0377  
Fax: +852 2634 0390  
info@asia.omicron.at  
www.omicron.at