

# MBB1

Automated measurement balanced bridge for differential PD measurements with MPD 600



# Reliable PD detection in high-interference test settings

## Noise interferes with PD measurements

The signals emitted from partial discharge (PD) activity often have a low intensity. For reliable detection, it is therefore crucial to use highly sensitive PD measurement equipment, like our MPD 600 system.

## Techniques used to eliminate noise

Since PD measurements often cannot be carried out in shielded areas, noise suppression and source separation techniques are very important to ensure reliable results.

In addition to these techniques, differential measurement using a PD measurement balanced bridge is a common method for reducing interference during PD testing as specified by IEC 60270.

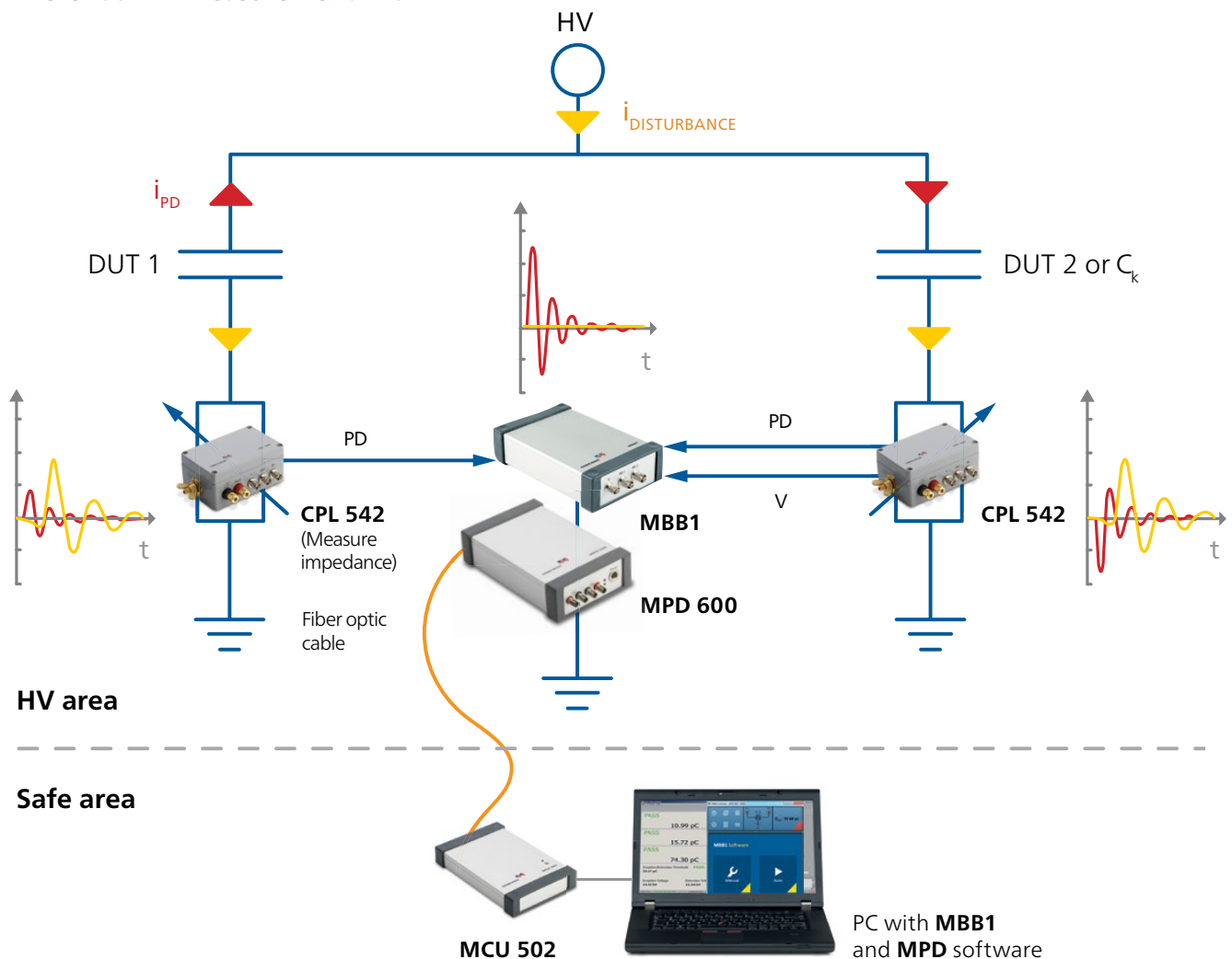
## Principle of differential PD measurement

In a differential PD balanced bridge measurement, the PD signals are measured at two positions in the circuit with a shared reference potential. These include the Device Under Test (DUT) branch and the second Device Under Test (DUT 2) or coupling capacitor ( $C_k$ ) branch.

The impact of disturbances, which couple into the PD test setup as a common mode signal, is reduced by using the difference of the measurement signal of both branches in a balanced setup.

The differential PD measurement leads to an improvement of the signal-to-noise-ratio and to a significant reduction of common-mode disturbance signals.

## Differential PD measurement with MBB1



## MBB1 at a glance

Our MBB1 is a smart, computer-controlled measurement balanced bridge used with our MPD 600 system to perform differential PD measurements as recommended by IEC 60270.

It can be applied to AC and DC test setups both in the laboratory and on site. It enables balanced, single-phase PD testing on a variety of high-voltage assets, such as:

- > Bushings
- > Cables
- > Instrument transformers

## Automated settings increase efficiency

The MBB1 is the only PD measurement balanced bridge to feature plug-and-play operation. Automated settings allow you to work quickly and to achieve optimal results.

## Flexible bridge settings

During PD testing, the MBB1 allows you to switch between various bridge states. The calibration factor is automatically set according to the chosen state.

As a result, single branch measurements and balanced or unbalanced differential measurements may be easily compared during the test without disruption.

A comparison of the PD pattern in different MBB1 switching states helps you to characterize and localize signal sources during the measurement.

## Applicable also on asymmetrical circuits

Due to the adjustable weighting capability of the MBB1, it can be used on asymmetrical measuring circuits that have differences in impedance and capacity of up to a factor of about ten in the two branches.

## Your benefits

- > Performs differential PD measurements with MPD 600 as specified by IEC 60270
- > Ensures enhanced noise reduction in test areas with high interference
- > Guided workflows and automated settings ensure greater efficiency and optimal test results
- > Remotely controlled by a PC from a safe working area in HV environments

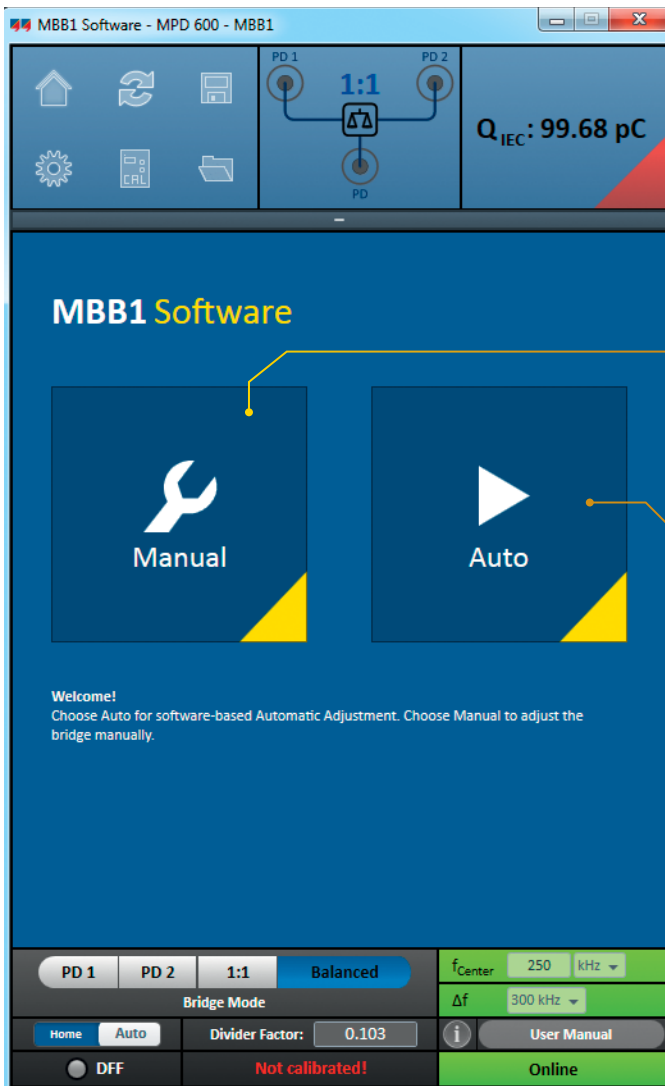
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# MBB1 Software

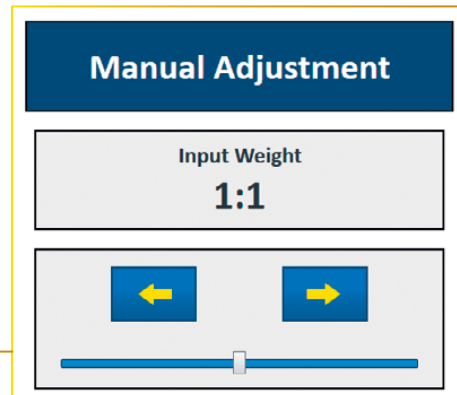
Remote control of the MBB1 measurement balanced bridge is done with the MBB1 software on a computer in the safe area. It allows you to control all hardware parameters, either manually or automatically. Guided workflows help you to balance and calibrate the PD measurement system.

The software also provides you with a real-time overview of the bridge and measurement settings. You can save bridge settings and reload them for later use to ensure consistent test results.

## Software Dashboard

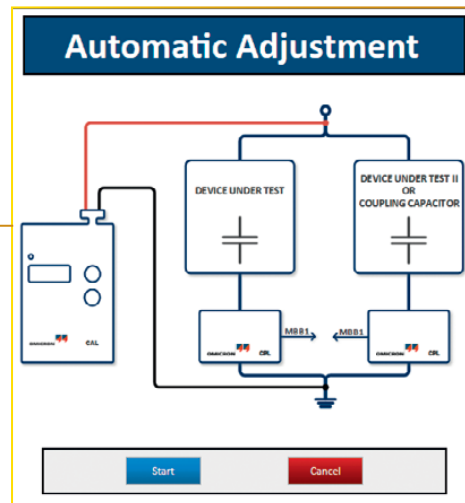


## Manual mode



The weighting of the two input branches can be adjusted manually with a single slider.

## Automatic mode



Parameters are automatically calculated based on measurement setup and frequency.

# Technical data and ordering information

## Technical data

### MBB1 Hardware

#### Device

Material	Extruded aluminum
Dimensions (W x D x H)	110 x 190 x 44 mm (4.33 x 7.48 x 1.73 in)
Weight	650 g (1.43 lb)

#### Power Supply

Source	Fed via AUX connector from MPD 600
Power consumption in standby	< 700 mW
Max. power consumption during parameter change / communication	1300 mW

#### Dynamic

Frequency range	100 kHz – 1 MHz
Maximum voltage V input	60 Vrms
Maximum voltage PD inputs	10 Vrms

#### Connections

Primary connections	3 x BNC (PD-1, PD-2, V)
Outlet	2 x BNC (PD, V)
Control and power supply	via AUX-connection (4-pin LEMO plug) to MPD 600 with MBB1

#### Environmental conditions

Operating temperature	0 °C ... 55 °C (32 °F ... 131 °F)
Storage temperature	-10 °C ... 70 °C (14 °F ... 158 °F)
Humidity	5 % ... 95 %, non-condensing

### MBB1 Software

#### Control software

MPD/MI Software 1.6.3 or later and MBB1 License on MCU are necessary.

#### Software system requirements

OMICRON Software for MPD and MI 1.6.3 installed.

Operating system	Windows 7™ (64 bit), Windows 8 and 8.1™ (64 bit), NET4.0 or later
CPU	Multicore system with 1.2 GHz or faster Single core system with 1.2GHz or faster
RAM	4 GB or more
Display resolution	1280x768 or higher
Graphics Adapter	Support of DirectX7.0 or higher

## Ordering information

Description	Order no.
<b>MBB1 Measurement Balance Bridge Package</b>	VEHZ4149
<ul style="list-style-type: none"> <li>&gt; 1 x MBB1</li> <li>&gt; 1 x AUX cable</li> <li>&gt; 5 x BNC cables</li> <li>&gt; 1 x MBB1 software and MBB1 license, user manual, software CD/DVD</li> </ul>	
<b>Complete Single-Phase PD Measurement Package</b>	VE004136
<ul style="list-style-type: none"> <li>&gt; 1 x MPD 600 measurement unit</li> <li>&gt; 1 x MBB1 measurement balanced bridge (for differential PD measurements)</li> <li>&gt; 1 x CAL 542-Type D (for bridge adjustments)</li> <li>&gt; 1 x MCU 502 controller unit</li> <li>&gt; 2 x CPL 542 quadripoles (0,5A)</li> <li>&gt; Fiber optical cables (20m), measurement BNC cables</li> <li>&gt; 1 x Combined charger/power supply, battery</li> <li>&gt; 1 x Basic MPD software package</li> <li>&gt; 1 x MBB1 software and MBB1 license, user manual, software CD/DVD</li> </ul>	



### MPD 600

- > IEC 60270-compliant PD measurement and automated reporting
- > Synchronous multi-channel PD measuring and recording
- > Excellent interference immunity for measurements under difficult conditions
- > Full galvanic isolation for safe operation

[www.omicronenergy.com/mpd600](http://www.omicronenergy.com/mpd600)

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

Customers in more than 140 countries rely on the company's ability to supply leading-edge technology of excellent quality. Service centers on all continents provide a broad base of knowledge and extraordinary customer support. All of this together with our strong network of sales partners is what has made our company a market leader in the electrical power industry.

For more information, additional literature, and detailed contact information of our worldwide offices please visit our website.