



The DTM (Diagnostic Transformer Monitor) is a microprocessor-based device that continuously monitors bushing insulation based on the sum of currents method and partial discharges that may be produced due to bushing and transformer insulation defects. With additional load current signals it allows the detection of critical winding deformation resulting from short circuits.

The basic standalone unit shown in the picture consists of four modules (from the left to the right): Power Supply, main CPU module, Bushing Health and Winding Module (BHWM) and a 15 channel partial discharge module (PDM).

The basic unit may be extended with additional modules allowing for more economical or accurate way of monitoring multiple objects. The DTM can have up to six BHWM or PDM modules allowing monitoring several transformers/metering transformers (within allowable signal cable distance) with one monitor.

The DTM offers a variety of additional inputs/outputs for monitoring temperatures, humidity, pressures, transformer tank vibrations, voltages and currents along with partial discharges and bushings. With four dry C-form relay contacts and a 4-20 mA output it offers an easy method to incorporate the DTM into a DCS/SCADA system.

Three communication interfaces including USB, Ethernet and an Isolated RS-485 providing flexibility for monitor networking, as well as for easy local communication to the instrument. All configuration and other features of RMM are available for any higher level plant automation system over MODBUS RTU communication protocol.

The DTM comes with IHM (Insulation Health Monitoring) software for data presentation and analysis and maintenance planning.



Electrical Diagnostic Innovations, Inc.

## Technical Specifications

<b>Application</b>	Diagnostic continuous monitor for a power or metering transformer
<b>Modules</b>	Four: Power supply, Main, BHWM and PDM
<b>Mechanical dimensions, total</b>	9"x7"x4.5", DIN rail mount
<b>Power supply</b>	100 – 240 VAC, 50/60 Hz
<b>Operating temperature</b>	-30°C - +70°C
<b>Bushing module (BHWM) Inputs/Interface</b>	
Bushing sensor inputs	6 (EDI BAU sensor or compatible)
Load current inputs	3 (EDI sensor required)
Voltage	1
Interface	USB
Display/Keypad	Optional over DB25 connector
BHWM Modules total	Up to six
<b>Partial Discharge module (PDM) Inputs/Interfaces</b>	
PD sensor inputs	15 (EDI offers variety of PD sensors))
External synchronization input	1
Hardware noise filters flexibly configurable	By Amplitude, by Polarity, by Time Of Arrival
Interface	USB, RS-485
Internal data memory	8 MB (over one year of data)
Display/Keypad	Optional over DB25 connector
PDM Modules total	Up to six
Communication protocol	MODBUS RTU and proprietary
<b>Main CPU module Inputs/Outputs/Interfaces</b>	
Temperature inputs	7 from RTD 100Pt
Ambient humidity input, RH%	1 (EDI sensor required)
Vibration inputs	4 (EDI sensor required)
4-20mA Inputs	6 (can be flexibly used for smart sensors)
Current input	3 (EDI 5 Amps current sensor required)
Voltage input	3 (120 VAC)
4-20mA output (passive)	1
C-form relay output	4
Ethernet, USB, RS485 (isolated)	One of each interface
Display/Keypad	Optional over DB25 connector

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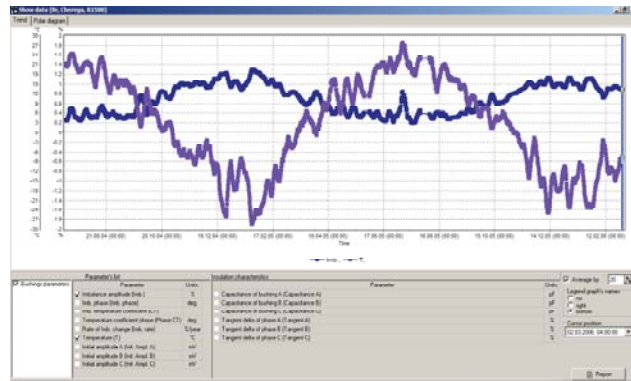
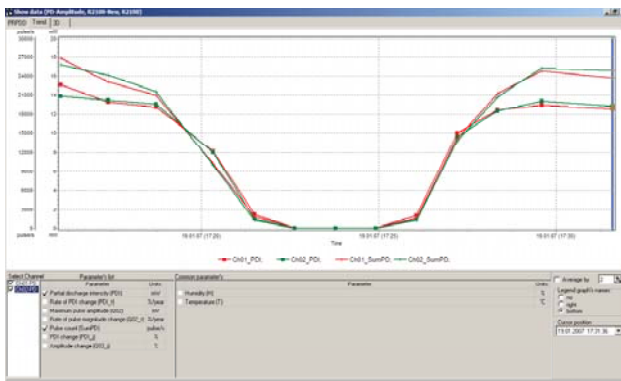


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On board data memory	8 MB
Communication protocol	MODBUS RTU and proprietary
Signal cable length (RG-58)	Up to 100 meters
<b>EDI bushing and PD sensors for transformers</b>	
Bushing sensor BAU series	All main bushing test tap designs are supported. Serves both bushing insulation tests and partial discharge tests
80 pF Coupling Capacitor installed on low voltage winding	7.2kV, 16kV, 27kV, Serves partial discharge tests
Solid core radio-frequency current transformer, installed on a feeder cable shield	0.9" ID, Serves partial discharge tests
Split core radio-frequency current transformer, installed on a neutral bus	Split-core 2.6" ID, clamp-on, Serves partial discharge tests

**IHM Software for DTM**

IHM (Insulation Health Monitoring) is a versatile software product supporting all EDI Inc. portable instruments and continuous insulation condition monitoring systems that may be found on HV transformers, MV motors, switchgear, cables and other. IHM allows configuring instrumentation, downloading and storing the data into PC memory and data presentation and analysis.



Screenshots of the trending plot for DTM

Left - PD Trends

Right - Bushing/Temperature Trends

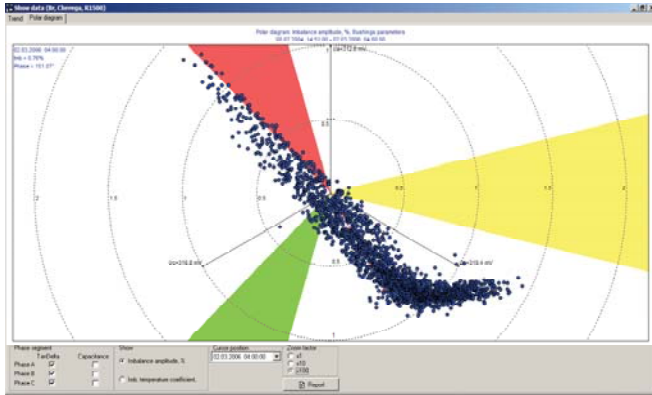
Multiple additional parameters may be recorded and stored by the DTM along with partial discharges or bushing insulation data. Trending display allows for viewing historical data and correlation between various measured characteristics.

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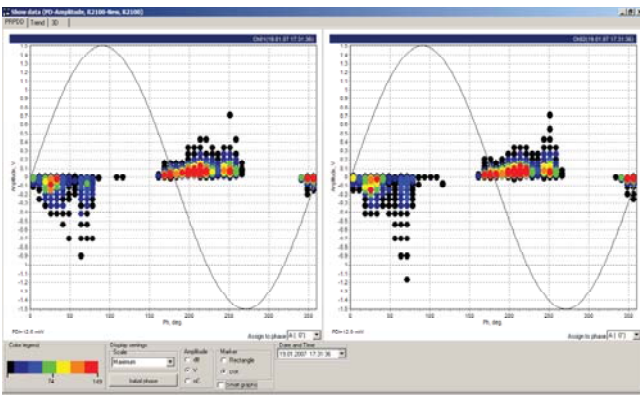


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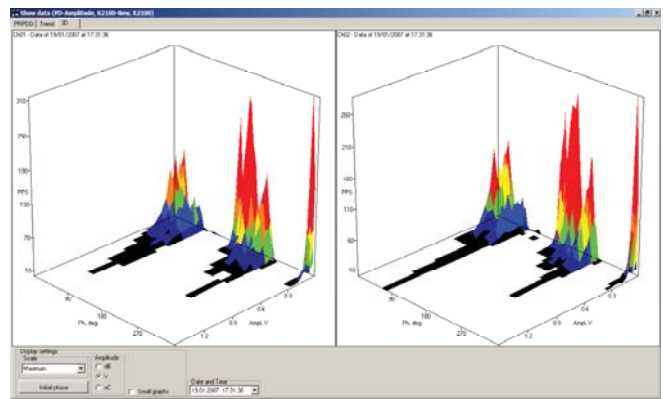
Screenshot of the polar plot for BHM

Polar plot is an effective way of presenting vector type information. This type of plot is used in IHM software for imbalance signal and imbalance temperature characteristics.



Screenshot of the PRPDD plot for DTM

PRPDD plot is an effective way to analyze a type of partial discharge, PD assignment in three-phase voltage system and other PD characteristics.



Screenshot of the 3-D plot for DTM

This is a common way to present phase-resolved partial discharge data and investigate its structure.