

ICMsystem



Instruments

ICMsystem - Digital Partial Discharge Detector

The ICMsystem is part of the Power Diagnostix ICMseries of digital partial discharge detectors. The ICMsystem is a powerful, versatile instrument for evaluating the condition of medium and high voltage insulation. The ICMsystem is usable over a range of frequencies of applied voltage, including power system frequency (50/60 Hz) and VLF (0.1 Hz).

Partial discharge (PD) measurements are a proven method for effective, non-destructive evaluation of electrical insulation. The Power Diagnostix ICMsystem provides high-resolution digital PD patterns for characterization of defects in high voltage insulation systems.

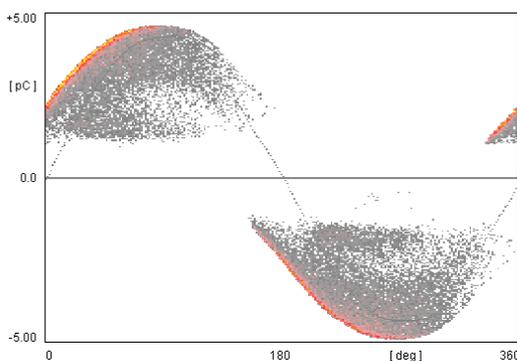
Versatility

The key to the versatility of the ICMsystem is its modular design. The ICMsystem can be matched up with a variety of special accessories that adapt it to virtually any high-voltage testing environment. A wide range of external preamplifiers provides control of the frequency range in which PD activity is detected, from 40 kHz up to 2 GHz.

Assorted coupling devices, including quadrupoles, coupling capacitors, and current transformers, are available to sense the PD signal in the object under test. Like the other instruments

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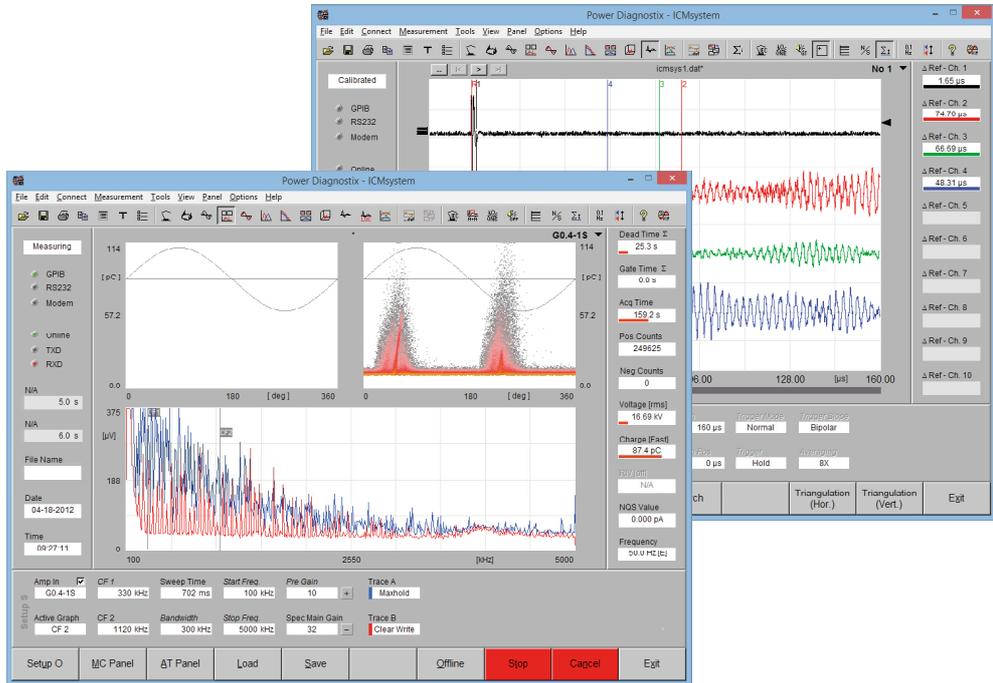
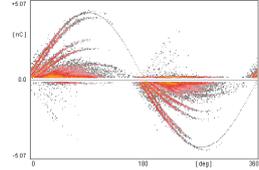
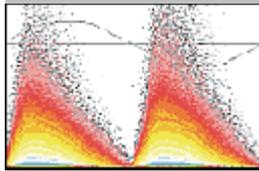
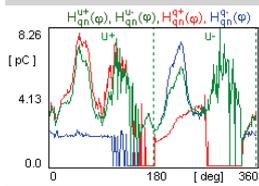
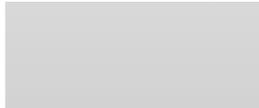
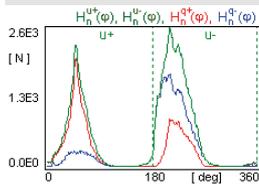
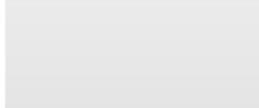
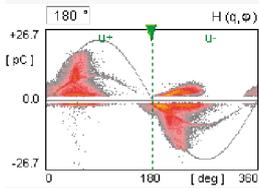
in the ICMseries, the ICMsystem provides effective noise gating that blocks phase-stable noise as well as noise independent of the applied voltage cycle, allowing the ICMsystem to be used in noisy environments without losing significant PD data. Appropriate selection of a preamplifier can assist further in achieving a high signal-to-noise ratio.



Phase-resolved PD pattern

PC Software

The operating parameters of the ICMsystem are fully computer controlled, making it simple to use with standard Power Diagnostix software. The actual recording of PD patterns is independent of the PC, so the performance of the ICMsystem is unaffected by speed limitations of the PC or communications.



The ICMsystem's PC software includes convenient options for in-depth analysis and printing of stored PD patterns.

Special Applications and Options

For applications such as DC testing or stepped high-voltage testing, the ICMsystem allows recording PD activity versus time (sequentially) instead of versus phase angle. Options such as a multiplexer module, fiber optic bus, and built-in modem further extend the capabilities of the ICMsystem. The multiplexer module, working with ICMmux software, allows easy selection among eight channels for PD measurement. The fiber optic bus provides enhanced protection in hazardous measurement conditions

and can link widely separated components of a test setup. The modem option permits remote access to data and control of the ICMsystem. The full command set of the ICMsystem is provided on request, so users may create custom programs to control the ICMsystem for highly specialized applications or for integration into an overall high-voltage test control program.

Options:

- Multiplexer
- Built-in spectrum analyzer
- RIV measurement
- Cable fault location
- Acoustic PD location with ϕ - q Trigger

Giving users complete access to detailed control parameters and the ability to download and analyze PD patterns on a PC makes the ICMsystem the ideal instrument for advanced analysis of phase-resolved partial discharge patterns, whether in research, utility, or industrial applications.

The multi-channel version of the ICMsystem is specifically designed to meet the requirements of partial discharge acceptance tests on large power transformers. The instrument builds on the acquisition core of the standard ICMsystem.



ICMsystem with ten channels

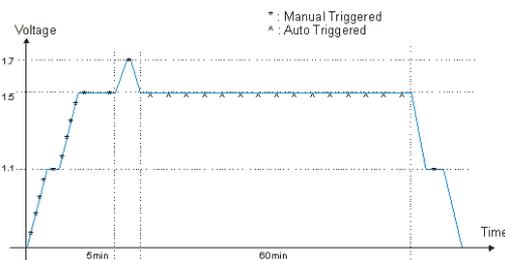
However, by introducing an individual amplifier plug-in for each channel, true parallel acquisition of the discharge magnitude of up to ten channels is achieved. The instrument can be equipped with optional features like RIV or acoustic PD measurement.

Using the multi-channel ICMsystem greatly simplifies partial discharge acceptance tests on large power transformers. With the true parallel acquisition of the partial discharge activity on eight channels, the overall testing period is substantially shortened.

True multi-channel partial discharge acquisition

Independent Channels

For each of the partial discharge measurement channels an independent quadrupole, pre-amplifier, and amplifier plug-in is provided. Internally, the system controller processes the discharge readings acquired for each channel in a true bipolar peak amplitude acquisition. Optionally, the PD readings can be weighted according to IEC 60270-2000.



Typical test sequence for HV transformer

Besides the partial discharge channels, the instrument offers the same number of independent channels for the measurement and sampling of the AC voltage signal provided by the quadrupole.

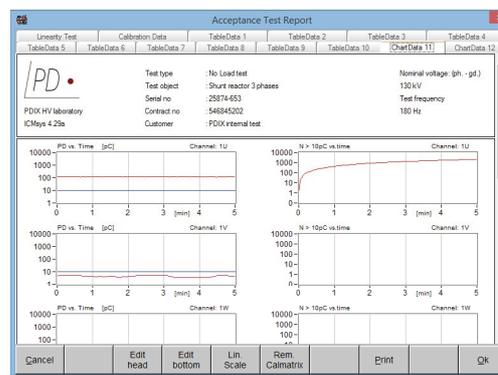
Pattern Acquisition

In addition to the parallel acquisition of the PD activity for the meter and strip-chart displays, the pattern acquisition core offers the defect identification capabilities of the phase-resolved partial discharge analysis. The influence of power frequency harmonics on the PD pattern, often found with power transformers, can be clearly identified, as the waveform of the AC voltage is available for each channel.

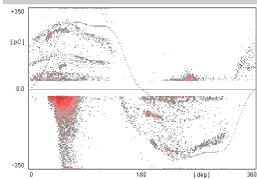
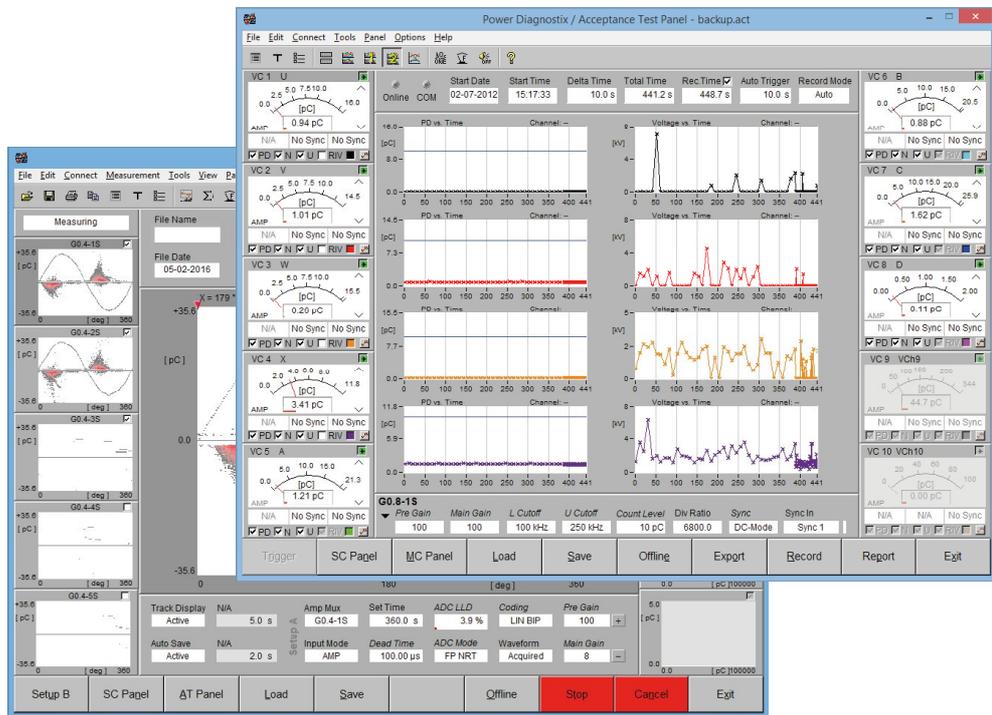
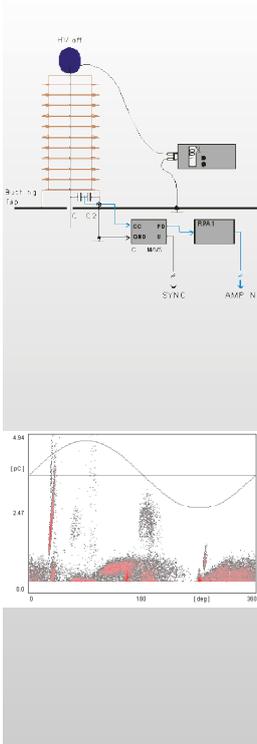
Specialized Software

The ICMsystem control software for transformer acceptance testing offers manual and automatic modes for the acceptance test.

Reporting is simplified with MS Word and plain text output formats. The reports are based on user-selectable templates.



Report data



In acceptance test mode, the software shows eight meter displays, each indicating PD level, voltage, and frequency of the specific channel. With the center display, the automatically or manually triggered values are presented in list mode or as a strip-chart. Further, during calibration, the cross-coupling matrix between the channels is built up, which eventually can help locating the source of PD activity. Additionally, the multi-channel ICMsystem software provides the user with all the features known from the standard ICMsystem, such as multi-channel consecutive pattern acquisition, movie-like replay, or statistical evaluation, for instance.



Multi-channel ICMsystem installed in a control room

The ICMsystem for power transformer acceptance testing is the first commercially available partial discharge detector with true parallel acquisition on eight channels. The instrument and its software greatly simplify the testing procedures and, thus, reduce the time the transformer needs to stay in the acceptance test lab.