The main task of the partial discharge monitoring system type ICMmonitor CA is to detect internal partial discharge in power cables caused by cracks in joints and terminations or degradation in the insulation system at an early stage. PD signals are picked up by a current transformer and preprocessed by an FCU3.

A monitoring control rack (PDMCR) with ICMmonitor CA software installed receives the measured data from the monitoring units and processes it. Due to the dielectric properties of cable materials and their attenuation, partial discharge activity in power cables is typically measured in a frequency band of several tenth of MHz. The frequency converter unit (FCU3) is a signal conditioning unit with a demodulating logarithmic transfer function. It picks up the HF signal from a current transformer (CT). The output of the FCU3 is the envelope of the HF signal down-converted into the frequency range of the instrument (< 1 MHz). The FCU3 is mainly used with monitoring applications and for gating purposes. This unit is remote powered by a DC phantom voltage provided by the ICMmonitor CA. A malfunction of the FCU3 will be detected automatically by the monitoring unit and will be indicated in the main panel of the software.

An external synchronization signal is usually derived from a VT, which is installed in short distance to the PD measuring device. If such a short distance installation isn’t possible, due to space restrictions e. g., Power Diagnostix offers a special synchronization unit FSYNC1, which allows transmission of synchronization signals over long distances via fiber optic cables.
The number of current transformers to be monitored depends on the type of cable and the individual specification of the customer. Up to six signal cables from current transformers are brought together into one ICMmonitor CA instrument. All monitoring instruments are interconnected via a fiber optic LAN ring, providing n+1 communication redundancy. A monitoring control rack (PDMCR) receives the measured data and processes it. With this system architecture, a nearly infinite number of current transformers can be continuously monitored and observed.

**ICMmonitor CA Software**

In combination with the monitoring software installed on the industrial PC (IPC), the trending data of peak values ($U_{pp}$) and averaged pulse values ($U_{avg}$) of years can be archived. Additionally, data like PD patterns, system health information, or alarm events can be stored and evaluated. If connected to a local intranet it allows remote diagnosis and control of the full PD monitoring system. Different functional levels can be set for administrative, operational, or evaluation purpose.

Each ICMmonitor CA offers PD monitoring on HV cable systems on up to six channels in parallel. The acquisition unit is remote controlled via fiber optic connection or USB. The ICMmonitor CA software allows archiving of the trending data of several years.