Abstract

The objective of this work is the design and development of the Data Acquisition and Storage parts of a measurement system that will be used for the Condition Monitoring (CM) of Power Transformers. CM has the potential to reduce operating costs and maintenance, increasing the reliability. Power transformers’ failures carry great costs to electric companies and its prevention is very interesting for them.

In the literature different CM systems applied to power transformers can be found. All this CM systems, independently that they be based in fuzzy logic, behavioral model, etc., have a thing in common: they always need a Data Acquisition System for the measurement of a set of physical variables that can indicate a transformer’s anomalous behavior. Among said physical variables, temperature, moisture in oil, concentration of gases and vibration are found. To help in the maintenance of power transformers, the authors have developed the data acquisition and storage parts of a CM system based in behavior models. During the development stages of the CM system, an experimental power transformer was used. This power transformer was custom made to function like a bigger real power transformer. In this experimental scenario the behavior models were designed and validated. They were fed with data coming from sensors installed both inside and outside the transformer.

In the current project, the models were modified so that they only use data from external sensors, or from internal ones that do not imply open the transformer when they are installed. This is necessary since the installation of internal sensors in real working transformers is very costly, could interrupt the service and could also break the transformer’s guarantee conditions.

This paper focuses in hardware and software description of the Data Acquisition subsystem, from now Programmable Electronic Instrument (PEI), developed. Although, a brief description of the complete CM’s architecture is also done. The PEI is responsible for acquisition, processing and storing of sensor’s measurements.