

Bachelor Thesis Proposal

Setup of Medium Voltage Protective Relays in Real Time Application

The protective relay is a device with fundamental importance to manage the power systems in safe and efficient operating conditions.

By analyzing the voltage and current measurements, the relay is able to detect the occurrence of a fault in the network and, eventually, send the opening command to the circuit breaker to interrupt the circuit.

Moreover, the communication between the different protective devices allow the deployment of the so-called Distribution Automation (DA), which improves the reliability of the processes inside the power substation and, consequently, in the whole grid.

The objective of this thesis is the physical integration of industrial protective relays, present in our laboratory, with the real time digital simulator (RTDS). The distribution grid model will interface the installed devices to exchange command and measurement signals. Moreover, the devices will communicate each other using the IEC-61850 protocol to implement the protective functionalities.

Your tasks:

- Literature review about protection systems in distribution networks.
- Acquaintance with industrial software in order to configure the relays.
- Connection of medium voltage grid model with the protective devices using the auxiliary input/output contacts.
- Establish the communication architecture between the relays, via IEC-61850 messages.
- Implementation of a protective scheme to manage faults in the grid model simulations.

Your profile:

- Student of electrical engineering or information technique at RWTH Aachen University.
- Basic knowledge about distribution power system.

- Experience with modelling and simulations is beneficial.
- Willing to learn and test communication protocols for distribution grid automation.

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