

INTELLIGENT DEVICE FOR CAPACITOR BANKS PROTECTION AGAINST THE EFFECTS OF HARMONIC CONDITIONS WITHIN THE ELECTRICAL DISTRIBUTION NETWORKS

Goal of the project

Within the project was developed and tested an intelligent device for capacitor banks protection against the effects of harmonic conditions within the electrical distribution networks.

Installing a capacitor bank in a bus of an electrical network containing harmonics leads to the amplification of the harmonic conditions and to the risk of exceeding the admissible operating limits for the capacitor bank, regarding the current and voltage values, provided by the standards. The amplifications of harmonic currents or voltages can damage the capacitor. These risks can be predicted by real-time determination of the network harmonic impedance seen in the compensation bus.

Implementation of such an intelligent system will produce mainly two positive effects:

- Increasing the operational safety of the electric installations by reducing the number of capacitor bank failures.
- Reducing the costs for consumers by reducing the direct costs caused by the need to replace the damaged capacitors, and the indirect costs caused by the increased consumption of reactive power due to their out of service.

Short description of the project

The intelligent device is based on a microcontroller and its operating principle is to determine in real time the harmonic impedance and, based on its values, to anticipate the harmonic conditions effects on the capacitor bank.

Results

- The main outcome of the project is a functional experimental model and its documentation of implementation for an intelligent device for capacitor banks protection against the effects of harmonic conditions within the electrical distribution networks.
- A patent application has been filed within the project

Project implemented by

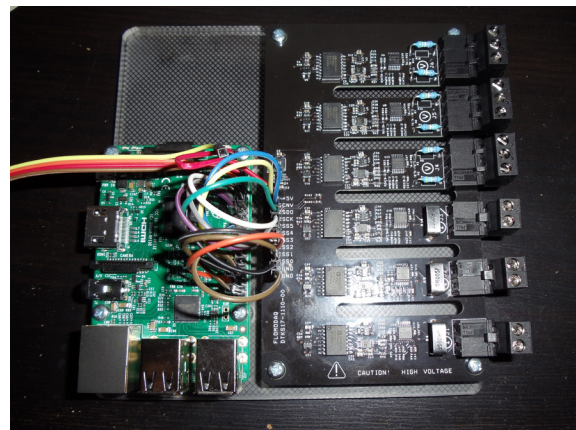
Politehnica University Timisoara – Research Service Provider
S.C. Energomecanica Serv S.R.L. – Beneficiary

Implementation period

25.07.2017 – 31.12.2017

Main activities

- Elaboration of the intelligent device execution documentation
- Construction and commissioning of the intelligent device
- Testing the device operation
- Optimizing the device operation
- Protection of intellectual property rights



Applicability and transferability of the results

The project was carried out under *Check of Innovation* financing instrument which means that since from the beginning of the project the applicability and transferability of the results has been ensured. The beneficiary of the main result of the project, the intelligent device, is actually the beneficiary of the project, S.C. Energomecanica Serv S.R.L., which is an energy provider on an industrial platform. The device can also be replicated for any consumer that uses capacitor banks for power factor improving.

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Research centre

Analysis and Optimization of the Electrical Power Systems Regimes

Research team

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