

## MICRO-SCADA SYSTEM FOR THE MANAGEMENT OF ELECTRICITY DISTRIBUTION, BASED ON A LORAWAN RADIO COMMUNICATIONS NETWORK

### Goal of the project

The project is intended to support activities of experimental development, consisting in combining and using the knowledge and multidisciplinary skills with the main aim of: designing, installing, commissioning, testing and validating a product - commercially usable prototype - consisting of a SCADA micro-system based on a LoRaWAN communications network. The project results will be the subject of the technology transfer from the service provider (UPT) to the beneficiary (MEL) in order to initiate its own capacity to develop similar systems.

### Short description of the project

The project includes activities for the design, installation, commissioning and testing of a final product - *a commercially usable prototype*: the functional SCADA micro system, based on a LoRaWAN communication network, with functions of optimizing the operation of the electrical network distribution from Straja Skiing Domain.

### Project implemented by

*SC MELIOR ELECTRO ENERGY SRL DEVA – beneficiar;  
Politehnica University Timișoara, Power Engineering Department –  
research service provider.*

### Implementation period

25.07.2017 - 24.12.2017

### Main activities

The SCADA micro system was designed as modules and components whose structures and functions are:

1. Universal radio communication module type W-COM01.LN4SEM;
2. Supply and extension I/O remote wiring module type 4DI4DO / 2RI - PS24 / 10;
3. High gain directive antenna kit for ISM band - EU 868 MHz;
4. Witness energy meter type CST 0410 - ACSMRQCL;
5. LoRa Bus for SCADA microsystem- Reactive Power Acquisition / Compensation Command;
6. RS232 / Ethernet Module - Server Device.

The optimal configuration of the system result:

- CDA bus - LoRaWAN access role; will be done with a RS232 / Ethernet Server Device (Network Server role);
- The Application Server (Central Control Unit) will be a computer in AIO configuration and will also be installed in the CDA bus;
- CDA buses (access point) and Conx bus (Enel - 20 kV cable beginning connection point) will be connected via the radio network,
- The Conx bus will be connected to the 20/0.4 kV transformers: PT1, PT2, PT2A.

### Results

The results of the research activities carried out by the service provider will materialize in the design documentation, installation, commissioning and testing of a final product - a commercially usable prototype: a functional SCADA micro system based on a LoRaWAN communications network for the management of the electrical distribution network from Straja Skiing Domain. The main functions of the system are as follows:

- Conx bus: LoRaWAN's central node role, manages multicast messages for synchronized acquisition, provides a secure radio link with CDA (Ethernet access point); collects data from the CST0410 witness meter;
- CDA bus: access point role in the LoRaWAN network - private; uses the RS232 interface to connect to the Network Server; execution role for switching the B1 and B2 coils;
- PT1 and PT2 buses: will contain future energy meters to register the consumers connected to them.

## Applicability and transferability of the results

The results will be the subject of a technology transfer (know-how) from the research service provider (UPT) to the beneficiary (MEL) in order to initiate its own capacity to develop similar systems for the market, which will contribute to the development company and increasing its competitiveness.

## Financed through/by

Executive Agency for Higher Education, Research, Development and Innovation Funding – UEFISCDI, *Competition: PNCDI III - Program 2, Subprogram 2.1 – Innovation Checks, PN-III-CERC-CO-CI-2017.*

## Research centre

Analysis and Optimization of the Electrical Power Systems Regimes

## Research team

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– Project manager;  
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– key person, Applied Electronics Department.  
Assoc.prof.PhD Florin MOLNAR-MATEI  
– Power Engineering Department;  
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