

# SMART GRID TRAINER



## Overview

When having Power Labs Ecosystem Trainers, with a use of the Smart Grid Software it is possible to have a Smart Grid system. The system allows to study the main concepts of smart grid, to explore its benefits and advantages in power network. The system includes a chain of power network (traditional, hydro, wind and solar power generations, power transmission and power distribution, etc.). The system is being monitored and controlled from the SCADA software.

YouTube Link: <https://youtu.be/vJ53DrCUg1g>



## Features

- ✓ Fault protection on generation plants
- ✓ Synchronization between generating plants
- ✓ Switching of generation sources in case of consumption increase (energy management)
- ✓ Power transmission monitoring and fault protection
- ✓ Power distribution monitoring, control and fault protection
- ✓ Remote control and monitoring of switchgears
- ✓ Automatic emergency control of switchgears
- ✓ Power consumption measurement and power quality analyses
- ✓ Power consumption tariffs
- ✓ Alarms&Event and Historical data Handling

## Key Benefits

- ✓ Wind tunnel for real wind simulation
- ✓ Real solar panel with sun simulator
- ✓ Real hydro turbine with a pump for flow simulation
- ✓ Real 3-phase synchronous generator
- ✓ Transparent electromechanical relays
- ✓ Open-source software platform for future modifications
- ✓ Low voltage usage to avoid shock to the users
- ✓ Advanced safety measures in the whole trainer to avoid damages due to incorrect terminations.

## Required Trainers

- ✓ Solar Power Generation
- ✓ Wind Power Generation
- ✓ Hydro Power Generation
- ✓ Traditional Power Generation
- ✓ Power Transmission
- ✓ Power Distribution
- ✓ Relay Protection
- ✓ Substation Automation

# Sample Single Line Diagram

The PLE trainers can be combined to compose microgrid like in the below single line diagram. Although the modularity of the platform allows to make more complex microgrids by adding additional generation stations, power transmission lines and distribution substations.



