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 form the SCADA software.

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

Features

- ✓ Fault protection on generation plants, fault protection in transmission lines, fault protection and isolation in power distribution
- ✓ Synchronization of the generator with the grid
- ✓ Critical load supply in case of emergency
- ✓ Power transmission monitoring
- ✓ Power distribution monitoring and control
- ✓ Remote control of switchgears
- ✓ Power measurement and quality analyses
- ✓ Power consumption tariffs
- ✓ Alarm and events handling in SCADA systems, historical data

Required Trainers

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

- ✓ 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.

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.
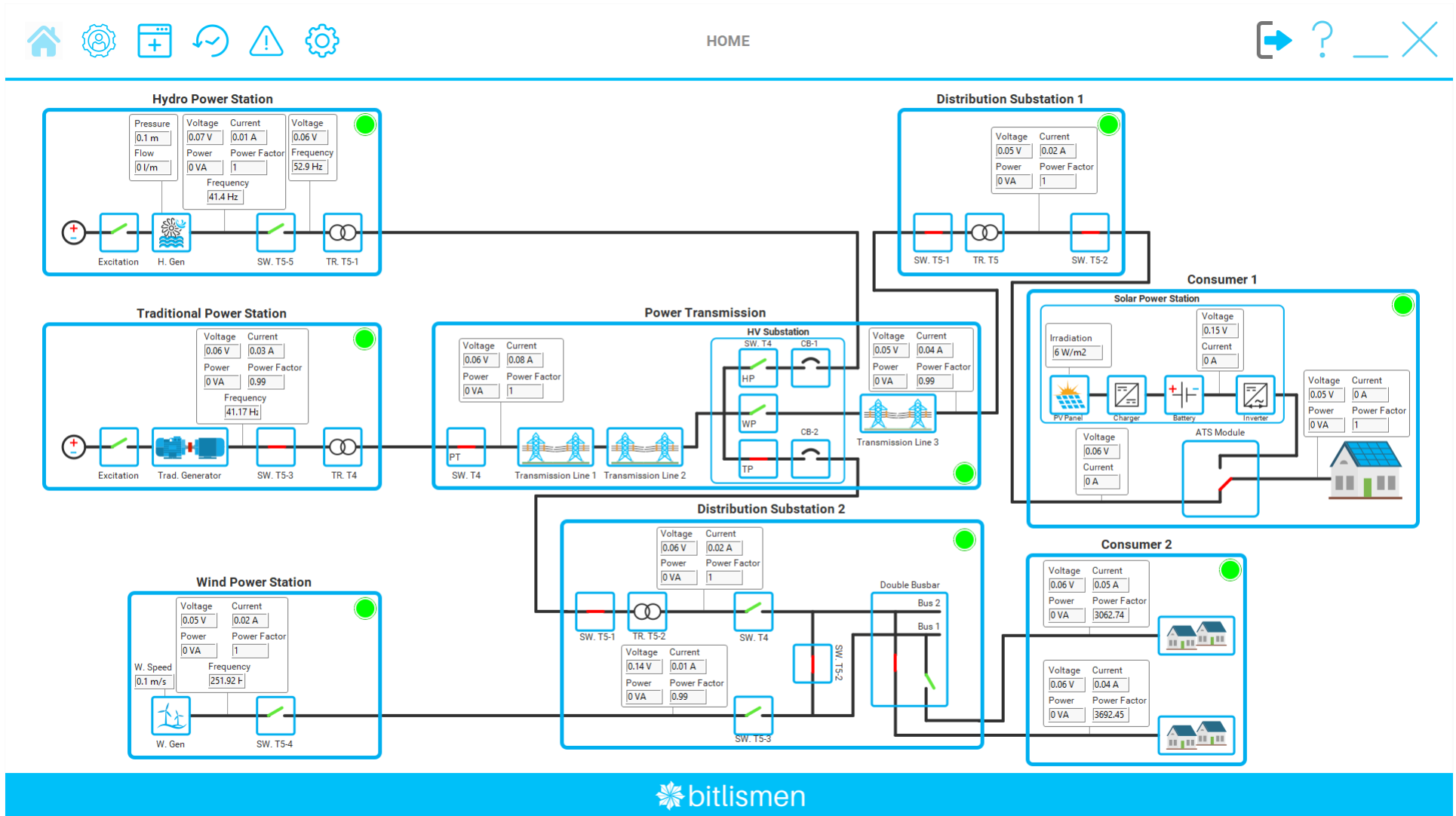
Smart Grid Software Screenshots and Hardware Pictures