

Application Note

Project Images



Client

Siemens Building Technologies
Energy Management System (EMS)
CSIRO Energy Centre – Newcastle

Application

Itech Corporation was engaged on this project to provide project engineering, control software design, and software development on a Siemens PCS7 based system.

Project Description

The CSIRO Energy Centre is supplied power by both Energy Australia and its own embedded energy systems. In normal operation power is supplied by Energy Australia (EAS) and the embedded systems synchronize with EAS and export power back to the grid if possible. In the event of a loss of power from Energy Australia the Energy Management Systems (EMS) will go through a defined sequence to switch supply to the embedded systems. When power from EAS is confirmed as restored the EMS will go through a defined sequence to re-establish supply from EAS. The embedded power supplies include wind, solar and micro gas turbine power. There is a long term plan to add fuel cells and a large storage battery to the site embedded systems.

The EMS consists of a control system having digital I/O to enable the switching of remote control switches (RCS) and provide feedback as to the status of the remote control switches and circuit breakers. The system was engineered using Siemens automation equipment. The power meters used are Siemens SIMEAS-P intelligent power meters. There are 40 meters connected via a Profibus network to the Siemens PCS7 Automation system. PCS7 is a powerful automation system featuring controllers, configuration and visualisation in an integrated system.

We designed the application solution to address the customers requirements. This involved creating a solution which monitored the power from the SIMEAS-P meters and then based on different switching scenarios we had to ensure the automation system executed correct sequencing of the site loads and the main supply switches. Since the site embedded supplies are not capable of providing the same power output as the main grid supply it was imperative to design a solution which monitored the load sequencing as it is taking place and ensure that set threshold levels are not breached. The need for flexibility in loading and unloading the system required the design of a solution which enabled the end user to review and change the load shedding schedules and hence tune his system over time. The system also featured ability for the user to manually control certain circuits with appropriate interlocking in place. User interface is via the embedded Siemens WinCC visualisation platform which is an integrated component of PCS7. The user interface provided operator monitoring and control, load sequence set-up, power usage trending and system alarming.