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# A PLC-Based Simulated Electrical Load Management System for Smart-meter Application

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## ECET-CPET 491 Sr. Design Project

# A PLC-Based Simulated Electrical Load Management System for Smart-meter Application

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## Final Project Report

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12/07/2012

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Submitted to:  
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## Abstract

This senior design project focuses on the issue of electrical loading and the management of the loads to reduce system stress and fatigue as seen by the electrical utility. When any circuit is overloaded due to demand, excessive heating occurs and damage can be the result if a significant amount of overloading occurs for a prolonged time. Damage is related to the amount of overload, and the amount of time the overload is applied.

Our projects idea is to manage the behind the scenes loads that when combined create overload conditions. Items that are heavy load appliances are the water heaters, air conditioners, washer and dryers, and dishwashers found in many homes. When compared to other energy shifting programs offered by the utilities, this project is much better because this project takes the consumers input out of the system and automates the process. For example, I&M offers a rebate program called "Smart Shift" in which the consumer "Shifts" their consumption habits to take advantage of reduced electric rates. Consumers willing to be involved in the process can take advantage of such programs. The main difference with this project is that it allows people to live their lives like they normally would; the project levels out the peak demand periods automatically.

## Keywords

- Electrical Load
- Energy
- Consumption
- Shifting
- Air Conditioning
- Heating
- Management
- PLC
- Ladder Logic
- Metering
- Electrical Panel
- Circuit Breakers
- Relay
- Current
- Voltage
- Current Transducer
- Latching
- Scaling
- Greater Than Function

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