Development of Home Power Management System

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Abstract

This study aimed at the design and development of a prototype Power Management System for home which will enhance energy user behavior for achieving energy consumption efficiency. It allows the user to transfer management of supply to appliances at home to a real time monitoring, switching and control device with four regulated and one unregulated supply outlets. The PIC16F887 Microcontroller was programmed to provide 24 hour real-time timing power consumption management according to user-supplied timing parameters made available to the programmed Code with the help of the PCF8583 real time clock. The home power management system developed under test produced outputs which exhibited good correlation with the input supply. Whereas the input to the device was 186V, the output for ports 1, 2, 3, 4 and 5 were respectively 187V, 185V, 184V, 185V and 183V which is a satisfactory input-output correlation. The unit also exhibited good implementation of the timing algorithm for all programmed outputs. It switched “ON” and “OFF” at the set times for the regulated ports showing that power was managed as desired in accordance with the inputted timing parameters. The user only has to set the timing parameters once and thereafter the device maintains these settings until such a time as the user decide to change them. Also the user does not have to surrender the decision on when power is switched ON to the device to make by making predictions based on whatever criteria. This ensures that the user retains certain level of control over the device in terms choice of when appliances should be powered. This flexibility in an automation system is one strong point of this device.

Keywords: Real-time, Power Consumption Management, Timing algorithm

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