



Home-Based Power Outlet Consumption Monitoring System

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Abstract: Our reliance on dwindling fossil fuels and increasing power generation has made the conservation and conscientious reduction of energy use of much greater importance today. While household appliances are increasingly more energy efficient, a household has a plethora of personal electronic devices (gadgets) for each member of the dwelling. The typical end-result is a monthly electric bill that leaves the question of where all the kilowatt-hours has gone.

This paper presents a system capable of monitoring and consolidating information regarding the energy consumption of individual appliance. The individualized power monitors are accurate to within one percent, and capable of measuring instantaneous wattage and volt-ampere. The consumption is aggregated and sent through the powerline to a central database, where a web-based client software reports and plots appliance consumption.

The system uses encryption to provide the necessary data security. The power monitor was tested on appliances varying in power from 3.5W to 1300W. Stress-testing by use of appliances rated from 180W to 1300W, carried out over a continuous three (3) day period verified the reliability of the system, while a survey showed that the user interface software was easy to understand and useful.

Key Words: Efficiency; Energy; Feedback; Power, Smart Power