

Using IoT on Single Input Multiple Outputs (SIMO) DC-DC Converter to Control Smart-home

Authors : Auwal Mustapha Imam

Abstract : The aim of the energy management system is to monitor and control utilization, access, optimize and manage energy availability. This can be realized through real-time analyses and energy sources and loads data control in a predictive way. Smart-home monitoring and control provide convenience and cost savings by controlling appliances, lights, thermostats and other loads. There may be different categories of loads in the various homes, and the homeowner may wish to control access to solar-generated energy to protect the storage from draining completely. Controlling the power system operation by managing the converter output power and controlling how it feeds the appliances will satisfy the residential load demand. The Internet of Things (IoT) provides an attractive technological platform to connect the two and make home automation and domestic energy utilization easier and more attractive. This paper presents the use of IoT-based control topology to monitor and control power distribution and consumption by DC loads connected to single-input multiple outputs (SIMO) DC-DC converter, thereby reducing leakages, enhancing performance and reducing human efforts. A SIMO converter was first developed and integrated with the IoT/Raspberry Pi control topology, which enables the user to monitor and control power scheduling and load forecasting via an Android app.

Keywords : flyback, converter, DC-DC, photovoltaic, SIMO

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