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Real Time Monitoring and Control of Proton Exchange Membrane Fuel Cell in Cognitive Radio Environment

Authors : Prakash Thapa, Gye Choon Park, Sung Gi Kwon, Jin Lee

Abstract : The generation of electric power from a proton exchange membrane (PEM) fuel cell is influenced by temperature, pressure, humidity, flow rate of reactant gaseous and partial flooding of membrane electrode assembly (MEA). Among these factors, temperature and cathode flooding are the most affecting parameters on the performance of fuel cell. This paper describes the detail design and effect of these parameters on PEM fuel cell. Performance of all parameters was monitored, analyzed and controlled by using 5KWatt PEM fuel cell. In the real-time data communication for remote monitoring and control of PEM fuel cell, a normalized least mean square algorithm in cognitive radio environment is used. By the use of this method, probability of energy signal detection will be maximum which solved the frequency shortage problem. So the monitoring system hanging out and slow speed problem will be solved. Also from the control unit, all parameters are controlled as per the system requirement. As a result, PEM fuel cell generates maximum electricity with better performance.

Keywords : proton exchange membrane (PEM) fuel cell, pressure, temperature and humidity sensor (PTH), efficiency curve, cognitive radio network (CRN)
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