Abstract
The functional security of the power grid depends upon the successful operation of thousands of relays that may be used in protective scheme for preventing the power system from cascading failures. The failure of one relay of the protective scheme to operate as intended may jeopardize the stability of the entire power grid and hence it may lead the whole system to blackout. In fact, major power system failures during a transient disturbance are more likely to be caused by unnecessary protective relay tripping rather than by the failure of a relay to take action. In other words, the performance of protective relay or system is very important to be known especially in smart power grid. Appropriate relay testing provides a first defense against relay mal-operations and hence improves power grid stability and prevents catastrophic bulk power system failures. In this work, new technologies that allow designing an enhanced relay testing system that can be used for improving the performance of protective relay have been used. We have designed and implemented microcontroller based relay testing system as well as tested its performance for showing its experimental evaluation.