Abstract

The power electronics circuits have interfaces to the microcontroller to enable their operation and controls. National instruments products are common for data acquisition but less common for hardware in the loop control of power electronics. In this project we have demonstrated that the NI myDAQ hardware can be used to control DC-DC converters and AC-DC rectifiers despite having limited analog input and output ports.

The control command and measured parameters of the system demonstrate very accurate switching and control. LabVIEW programming and other details will be demonstrated.

Results and Discussion

Project sponsored by National Instruments

Phase Control Rectifier:
- Accurate switching of the transistors produced a rectified waveform at the load. By using the NI myDAQ, input RMS voltages, output voltages, and output currents were obtained and displayed using the LabVIEW software.

Boost Converter:
- Within LabVIEW pulse width modulation was used to step up DC voltages to various higher DC voltages at the load. By using the NI myDAQ, output voltages and currents were obtained and displayed using the LabVIEW software.

Conclusion

Using the NI myDAQ hardware we enabled LabVIEW to control and acquire parameters from DC-DC converters and AC-DC rectifiers. Accurate switching of components were displayed in LabVIEW using various charts and graphs.