

## AFRL Sponsored Senior Design Project

### *Project Overview*

Design and build a wireless analog/digital I/O board along with PC software to control and display values from the board.

### *Objectives*

Prototype design on breadboard

- Board should have 4 analog lines (2 in, 2 out) along with 16 digital lines (8 in, 8 out). Dynamic sampling rates ranging from 1 Hz to 10 kHz are required. Some of the input lines will also need timing capabilities.
- Research and select a PIC/AVR microcontroller that is suitable for the project.
  - Research compilers and IDEs that work with chosen microcontroller
- Select a suitable digital to analog converter (DAC) and Bluetooth (BT) module.

Transition prototype to a printed circuit board (PCB)

- Layout prototyped design onto printed circuit board using ExpressPCB CAD software (<http://www.expresspcb.com/>)

Windows application

- Ability to communicate with BT module
- Display analog and digital input values and waveforms
- Display timer values
- Transmit DAC values and drive digital outputs

### *Contacts*

Jim Patrick  
Air Force Research Laboratory  
Phone: 937-904-9191  
Email: james.patrick@wpafb.af.mil

Jim Leonard  
Air Force Research Laboratory  
Phone: 937-904-9321  
Email: james.leonard@wpafb.af.mil