**Python\_Class\_Board.ino Firmware**

This is a quick install guide/protocol overview for the non-Firmata (AKA hardmode) software for our Python Class boards.

**Getting Started**

To get started, you'll need a few things:

* Python Class board, or build something like it with a real Arduino. Docs are [here](https://airmartechnology.sharepoint.com/:f:/s/PythonClass/Eg4VAla69upIiyqMIcjOe1wBt1sMXTFOeEUyXamnWcPNDw?e=lCTfae).
* Arduino IDE: You'll need the [Arduino IDE](https://www.arduino.cc/en/software).
* Python\_Class\_Board.ino: Download the file [here](https://airmartechnology.sharepoint.com/:u:/s/PythonClass/EXK_YoER--VNtg102DGFl14BKrYJaPcU0eJcsI6zvwUKHA?e=XgoBcw).

**Installing Python\_Class\_Board.ino**

To install:

* Start the Arduino IDE.
* Open Python\_Class\_Board.ino (it may tell you it needs to be in a folder, just click “Okay”)
* Plug in Python Class board
* In the Arduino IDE, go to Tools, Port, and select the com port your device is connected to.
* Go to Tools, Board: and select “Arduino Leonardo” as the device
* Click the Upload button (it looks like a rightward pointing arrow).
* Wait for installation to complete.

At this point, your Arduino board should have Python\_Class\_Board.ino installed.

**Python\_Class\_Board.ino Protocol**

### **Serial Port Configuration:**

BAUD Rate: 57600  
Start Character: !  
Delimiter: \r\n  
Flow Control: DTR  
  
Note: DTR may or may not be automatically applied in certain serial terminals/languages.

### **Message Construction:**

Each message is constructed with an exclamation point, followed by a command character, and optional parameter characters, terminated with a carriage return. Protocol is ASCII based.  
  
To enable the red LED, the command will look like the following:  
!LR1\r\n

### **Commands:**

#### Set LED State:

Description: Set LED to be on or off.  
Command Character: L  
Parameter 1: Led Color  
 Valid options:  
 G – Green LED  
 Y – Yellow LED  
 R – Red LED

Parameter 2: State  
 Valid options:  
 0 – Off  
 1 – On

Example:  
 Turn green LED on:  
 !LG1\r\n

#### Set Buzzer State:

Description: Set buzzer to on or off state.  
Command Character: B  
Parameter 1: State  
 Valid options:  
 0 – Off  
 1 – On

Example:  
 Turn buzzer on:  
 !B1\r\n

#### Get Switch State:

Description: Return the status of a switch  
Command Character: S  
Parameter 1: Switch  
 Valid options:  
 0 – SW1  
 1 – SW2  
 2 – SW3

Example:  
 Get status of switch SW1:  
 !S1\r\n  
 Response:  
 Device will respond with either 1\r\n if shorted, 0\r\n if open.

#### Get Temperature:

Description: Return temperature in degrees F (Accuracy is VERY sketchy due to the analog reference)  
Command Character: T

Example:  
 Get temperature in degrees F:  
 !T\r\n  
 Response:  
 Device will respond with an ASCII float value with two decimals of precision, followed by \r\n.

#### Get Potentiometer Voltage:

Description: Return 0 to 5V reading coming from potentiometer.  
Command Character: P

Example:  
 Get potentiometer voltage:  
 !P\r\n  
 Response:  
 Device will respond with an ASCII float value with two decimals of precision, followed by \r\n.