# The initial design included Power Relay Feather Wing, and INA169 high-side current monitor. Power Relay is a device that allows to control the power. INA 169 Power sensor allows to measure the current draw.

# CHALLENGE:

# The idea was to measure the current with INA169 and control flow of it with the power Relay.

While working with the sensor, the readings of the current were very inconsistent, and it was forced upon us to try to connect things different way. During

Those experiments with high current, 40V light bulb and current monitor two Arduinos ended up getting fried. Possible reason for this failure could be that GND pin was connected to the positive side of the source instead of the ground of the circuit which should be connected to the pin VIN+.

Another reason is that the pin VIN- was connected to a negative side of the load.

It seems that during the experiments with current, instead of sending the current through the INA169 sensor, that has built in Shunt Resistor, the current was accidentally sent through the Arduino itself, since Arduino itself is not adjusted to handle high current flowing through the system, it got damaged.

FINAL DESIGN:

Due to this failure, we decided to come up with new less harmful design. Now instead of INA169 the project will include photo resistor to read the amount of the light in the room. Power Real is equipped with 3 output pins;

COM – where we connect the signal we plan to switch

NC(Normally Closed) – which will not be used for this project, but the pin is mechanically connected, and disconnects from COM when the relay is set.

NO(Normally Open) – pin is mechanically disconnected from COM pin, when the relay is set, NO becomes connected to COM. Outlet Guard Arduino will wait for signal from Brainduino whether or not open the power relay, if the value is not received it will start reading values from the photo resistor.

Photo resistor is connected to pin 10 on Arduino.

The value read from photo resistor will vary from 1-9 and above. The outlet guard Arduino will send 3 digit message to Brainduino, first is always 1, denoting that signal was sent from Outlet Guard Arduino , second digit will represent the amount of light, and last digit will represent the current state of the power relay. 1 meaning that connection is closed, and 0 representing open connection. If the amount of light is less than 9 the power connection will open, otherwise it will remain closed.

There is serial connection between Brainduino and Outlet Guard Arduino.

It was decided that Serial Connection would be most cost effective as the project itself, was already expensive, the Bluetooth module would drive up the cost. In order for two microcontrollers to communicate, Outlet Guard Arduino will use built in library and pass the information with Serial.print() and respectively, receive the value from Brainduino using Serial. Read().The value received from Brainduino will be series of bytes which will force Outlet Guard Arduino to open connection in the Power relay or close it.