Wi-Fi & Automated Sprinkler System

Implementing an Arduino Microcontroller will allow us to gather the data from different sensors throughout the house (heat sensors, light sensors, laser trip wire) and broadcast the data to a server that will be set up using Wi-Fi Interface. A Wi-Fi shield for
Arduino will be connected to the server using the TCP/IP protocol with an assigned IP address that the server will use to listen to the information on that IP. We are planning on running an Apache server where we could store the data that comes in from the micro controllers. This data will be formatted and displayed on a secure website which is accessible from any internet connections. Using the Wi-Fi we will be able to send and receive data. Once we get the information from a temperature sensor in one of the rooms, and we decide to turn on the fans in the room to make it cooler, we would send a command to that micro controller that will be in charge of running the fans, to start to pump the cold air inside that room. Below is a diagram to illustrate Wi-Fi operations in the house. *Figure 1* – Shows how the overall look of the Wi-Fi will look like.

Figure 1

The following layout describes how the Sprinkler System will be automated in order to function through the WiShield that is attached to the Arduino. *Figure 2* explains the layout of the implementation.

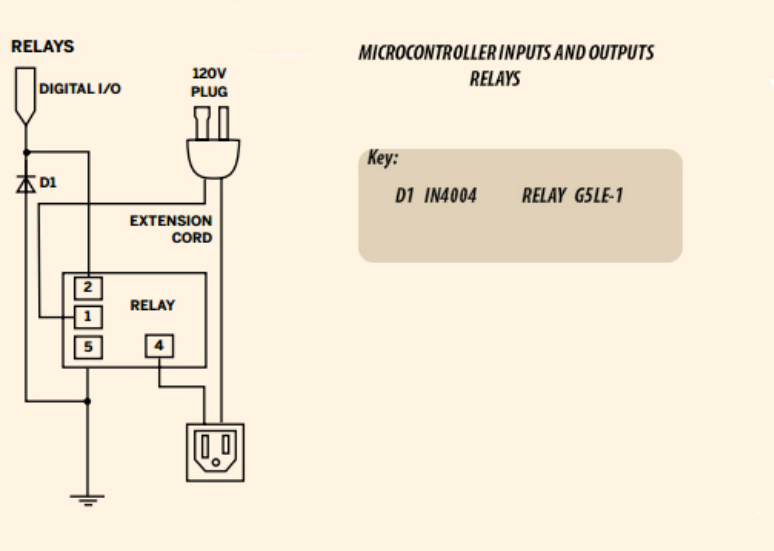

Figure 2

Relays will be controlled with digital outputs sent from the Arduino once the webserver initiates a certain command, that command will be based upon two different factors. One of the factors is the exact based on soil moisture level in the ground and the second is based on the time of the day. If the soil moisture is under the acceptable level and its night turn on the sprinkler system. Else leave it off until one the right parameters are acquired. *Figure 3* illustrates the next two steps necessary in controlling the sprinkler system.

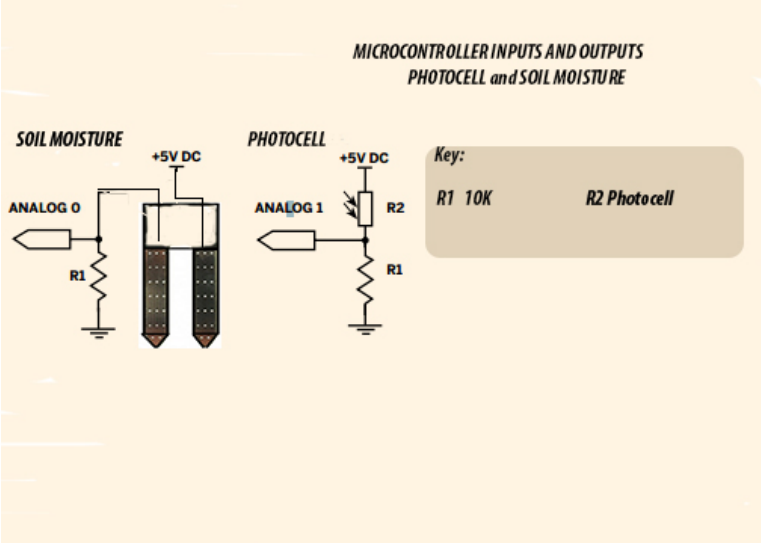

Figure 3

Part List

Wi-Fi & Sprinkler system

Source Data From	Sprinkler Control.SchDoc
Project:	Wi-Fi & Sprinkler Control
Variant:	U of U Computer Engineering
Report Date:	7/13/2012 16:30
Print Date:	11/2/2012 16:31

Description	Vendor	Comment	Value	Quant	Price	Total Part Price
Arduino Duemilanove	Sparkfun Electronics	Atmega328 microcontroler	Atmega328	1	45	$45
WiShield for Arduino	Async_labs	WiShield 2.0 - Arduino Shield	WiShield 2.0	1	55	$55
Omron G5LE-1 Relay	Omron	Relay to turn on the sprinkler	G5LE-1	1	5.99	$5.99
1N4004 diode	RadioShack	Diode	Micro 1-Amp	2	1.19	2.38
Photocell	RadioShack	Photocel for time of day	N/A	1	2.99	2.99
22-gauge wire solid core	RadioShack	Wire to connect relays to power	Wire	10 ft	0.5	4.99
10k resistors	RadioShack	Resistors	N/A	5	0.5	1.5
AC extension cord	K-Mart	Extension cord for water pump	N/A	1	5.99	5.99
NetGear Wireless Router	NetGear	Wi-Fi router for connectivity	Wireless N	1	59.99	59.99
Soil Moisture Sensor	DFRobot	Sensor for measuring moisture	SEN0114	1	4.8	4.8
					Total:	**$189**