

EE491 Weekly Report 8

Date: 10/25/16-10/31/16

Group number: May 1717

Project title: 19 - Wireless Solar Temperature/Humidity Sensor

Client: Dan Stieler

Team Members/Role:

Yi Qiu - General Member

Xiang Li - Webmaster

Kebei Wang - Team Leader

Trevor Brown - Key Concept Holder

Kukjin Chung - Communication Leader

Weekly Summary

We ordered some electrical components for our circuit system, and We also did some voltage test on our circuits system. We are now using LM35 as our temperature sensor, and nrf8001 BLE module and Arduino for our circuit system so far, and we are using bluetooth for transmitting the data to computer. For transmitting the data, we are still figuring out the problem that we have in our code.

Past week accomplishments (please describe as what was done, by whom, when)

- Kebei Wang -do research and work on design.
- Trevor Brown - Made a block diagram of the hardware, ordered samples from TI of the power management IC
- Yi Qiu - Prepare for group meeting and advisor meeting. Update the project plan to project website.
- KukJin Chung - Finished the project plan and worked on MIT app inventor software.

- Xiang Li —did some research on power converter, batteries. Troubleshoot and participated in group meeting.

Pending Issues

- Testing other kinds of sensors which will be delivered.
- Figuring out the setting and connection to transmit data from the board to computer by using arduino.

Individual contributions

<u>NAME</u>	<u>Individual Contributions</u>	<u>Hours</u>	<u>HOURS</u>
		<u>this week</u>	<u>cumulative</u>
Yi Qiu	prepare for group meeting and advisor meeting. Update the project plan to project website.	3	13.5

Xiang Li	did some research on power converter and batteries as well as participated in group meeting. Helped to troubleshoot the circuit and code.	3	16
Kebei Wang	contact client and advisor for group meeting. Sensor test help.	3	16.5
Trevor Brown	Tested multiple sensors and measured the power consumption. Ordered more TI sensor samples.	4	11
Kukjin Chung	I borrowed BLE module from our advisor and connected BLE module to the arduino board. I have made up the application code diagram.	3	16.5

Comments and extended discussion

- We still need to figure out measure the power consumption, and order some batteries to

try on.

- We need to think about how to transmit the data by bluetooth without arduino.
- We successfully achieve the data from the sensor and the translate the data from digital to diagonal, but it only can be shown on the computer screen, so we are about programming to make it be shown on the phone through bluetooth. The bottom is the code we made:

```

● #include <SPI.h>
● #include "Adafruit_BLE_UART.h"
●
● // Connect CLK/MISO/MOSI to hardware SPI
● // e.g. On UNO & compatible: CLK = 13, MISO = 12, MOSI = 11
● #define ADAFRUITBLE_REQ 10
● #define ADAFRUITBLE_RDY 2 // This should be an interrupt pin, on Uno thats #2
  or #3
● #define ADAFRUITBLE_RST 9
●
● Adafruit_BLE_UART BTLEserial = Adafruit_BLE_UART(ADAFRUITBLE_REQ,
  ADAFRUITBLE_RDY, ADAFRUITBLE_RST);
● /*****
  ***/
● /*!
  Configure the Arduino and start advertising with the radio
  */
● /*****
  ***/
●
●
● uint8_t tempC;
● int reading;
● int tempPin = 0;
●
● void setup(void)

```

```

● {
● analogReference(INTERNAL);
● Serial.begin(9600);
● while(!Serial); // Leonardo/Micro should wait for serial init
● Serial.println(F("Adafruit Bluefruit Low Energy nRF8001 Print echo demo"));
●
● // BTLEserial.setDeviceName("NEWNAME"); /* 7 characters max! */
●
● BTLEserial.begin();
● }
●
● /*****
● ***/
● /*!
●     Constantly checks for new events on the nRF8001
● */
● /*****
● ***/
● aci_evt_opcode_t laststatus = ACI_EVT_DISCONNECTED;
●
● void loop()
● {
● // Tell the nRF8001 to do whatever it should be working on.
● BTLEserial.pollACI();
●
● // Ask what is our current status
● aci_evt_opcode_t status = BTLEserial.getState();
● // If the status changed....
● if (status != laststatus) {
●     // print it out!
●     if (status == ACI_EVT_DEVICE_STARTED) {
●         Serial.println(F("* Advertising started"));
●     }
●     if (status == ACI_EVT_CONNECTED) {
●         Serial.println(F("* Connected!"));
●     }
●     if (status == ACI_EVT_DISCONNECTED) {
●         Serial.println(F("* Disconnected or advertising timed out"));
●     }
● }

```

- // OK set the last status change to this one
- laststatus = status;
- }
-
-
-
-
-
-
- if (status == ACI_EVT_CONNECTED) {
- // Lets see if there's any data for us!
- if (BTLEserial.available()) {
- Serial.print("* "); Serial.print(BTLEserial.available()); Serial.println(F(" bytes available from BTLE"));
- }
- // OK while we still have something to read, get a character and print it out
- while (BTLEserial.available()) {
- char c = BTLEserial.read();
- char s;
-
- if(s = c){
- reading = analogRead(tempPin);
- tempC = reading / 9.31;
- //Serial.println(tempC);
- BTLEserial.write(tempC);
-
- delay(1000);
- }
-
-
- Serial.print(c);
- }
-
- // Next up, see if we have any data to get from the Serial console
-
- if (Serial.available()) {
- // Read a line from Serial
- Serial.setTimeout(100); // 100 millisecond timeout
- String s = Serial.readString();
- if(s = 'c'){

- reading = analogRead(tempPin);
- tempC = reading / 9.31;
- Serial.println(tempC);
- delay(1000);
- }
- // We need to convert the line to bytes, no more than 20 at this time
- uint8_t sendbuffer[20];
- s.getBytes(sendbuffer, 20);
- char sendbuffersize = min(20, s.length());
-
- Serial.print(F("\n* Sending -> \")); Serial.print((char *)sendbuffer);
- Serial.println("\");
-
-
- tempC.get(sendbuffer,20);
-
-
- // write the data
- BTLEserial.write(sendbuffer, sendbuffersize);
-
-
- }
- }
- }
-

Plan for coming week (please describe as what, who, when)

- Kebei W. work on presentation, design document and arduino testing.
- Yi Q. work on display BLE data on mobile device and battery solution.

- Kukjin C. will work on coding to make up the connection between BLE module and arduino system.
- Trevor B. Continue research on TI chips and compare power consumption.
- Xiang L. Test the circuits with group members. Record some data and do some analyze, and also need to help with measuring about power consumption.