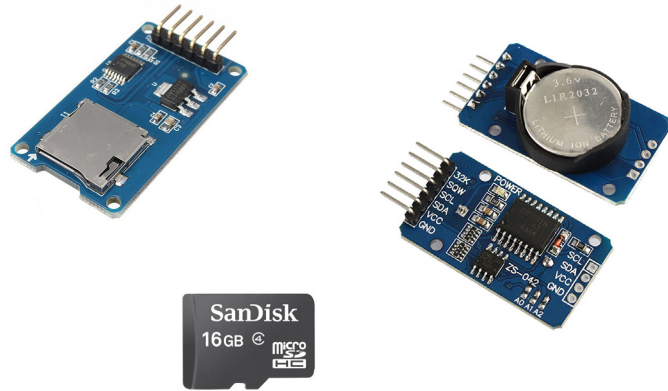


# AD3 : Data Logging in the Field



In this session we will be looking at recording data in the field. By the end of this tutorial you should be able to create a device that will allow you to make time-stamped data recordings in the field. For this tutorial you will need a few extra pieces of equipment:

- DS3231 RTC
- Micro SD card module
- Micro SD card (any size will suffice)



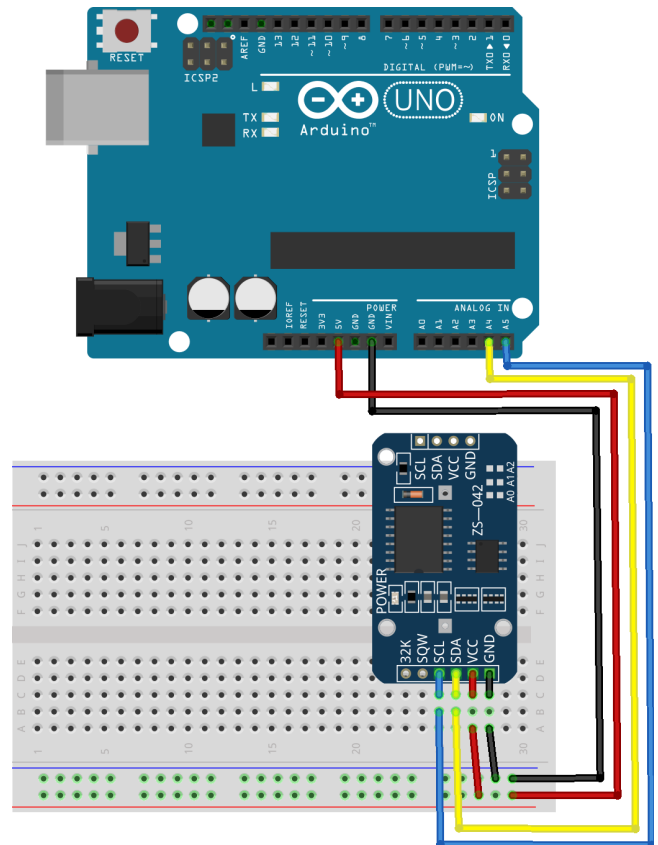
## DS3231 RTC.

Download library for DS3231 from:  
[www.rinkydinkelectronics.com/library.php?id=73](http://www.rinkydinkelectronics.com/library.php?id=73)  
or find the file named DS3231.zip with this pdf.  
In Arduino IDE go to  
Sketch>Include Library>Add .zip  
and navigate to the downloaded .zip file.

VCC to 5v  
GND to GND  
SDA to A4  
SCL to A5

Code to set the time can be found at:  
File > Examples > DS3231 > Arduino >  
DS3231\_Serial\_Easy

Follow commented instructions

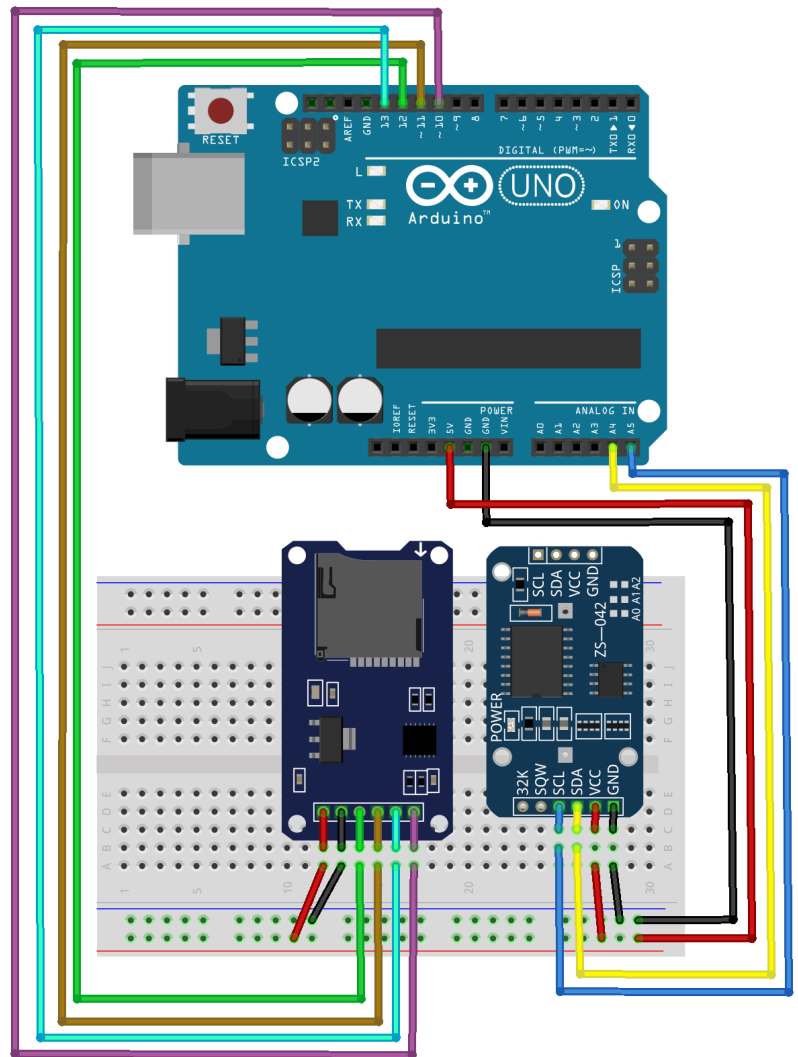


## MICROSD CARD MODULE.

VCC to 5v  
GND to GND  
MOSI to 11  
MISO to 12  
SCK to 13  
CS to 10

The code for this setup can be found with this pdf and is named "AD3\_Code\_MicroSD\_1.ino"

Upload this code and open the serial monitor to view the logging results. Make sure baud rate is set to 9600 in the serial monitor.



Serial Monitor

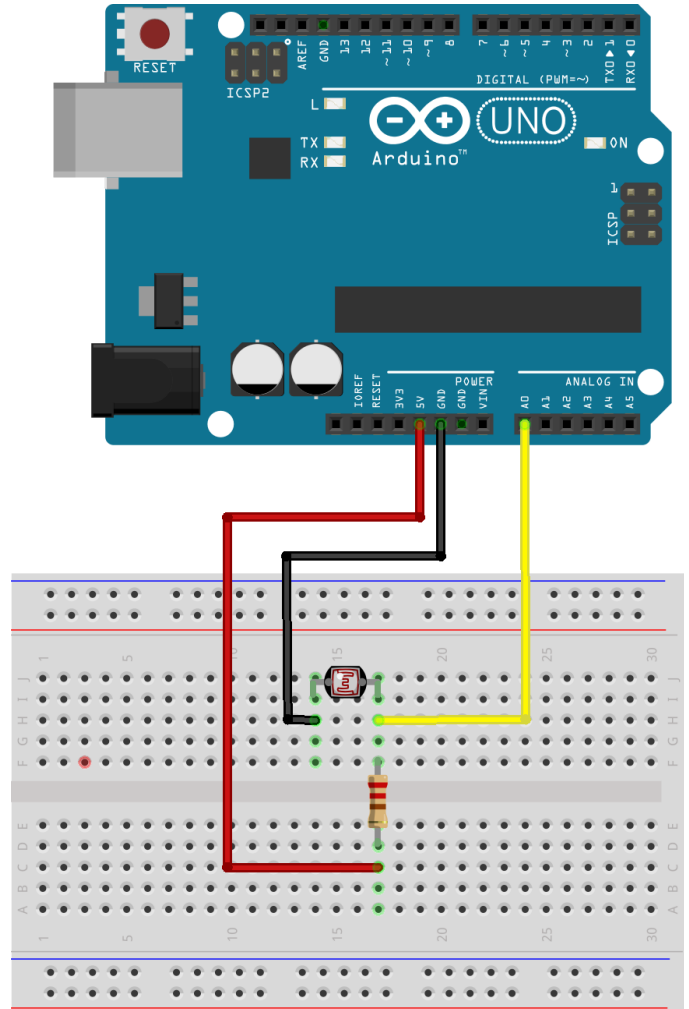
```
AD3_Code_MicroSD_01 | Arduino 1.6.14 Hourly Build 2016/12/07 02:12
AD3_Code_MicroSD_01
/*
 * Arduino SD Card Tutorial Example
 *
 * by Dejan Nedelkovski, www.HowToMeatronics.com
 */
#include <SD.h>
#include <SPI.h>
File myFile;
int pinCS = 10;
void setup() {
  Serial.begin(9600);
  pinMode(pinCS, OUTPUT);

  // SD Card Initialization
  if (SD.begin())
  {
    Serial.println("SD card is ready to use.");
  } else
  {
    Serial.println("SD card initialization failed");
    return;
  }
}
```

## LDR SIMPLE WIRING.

---

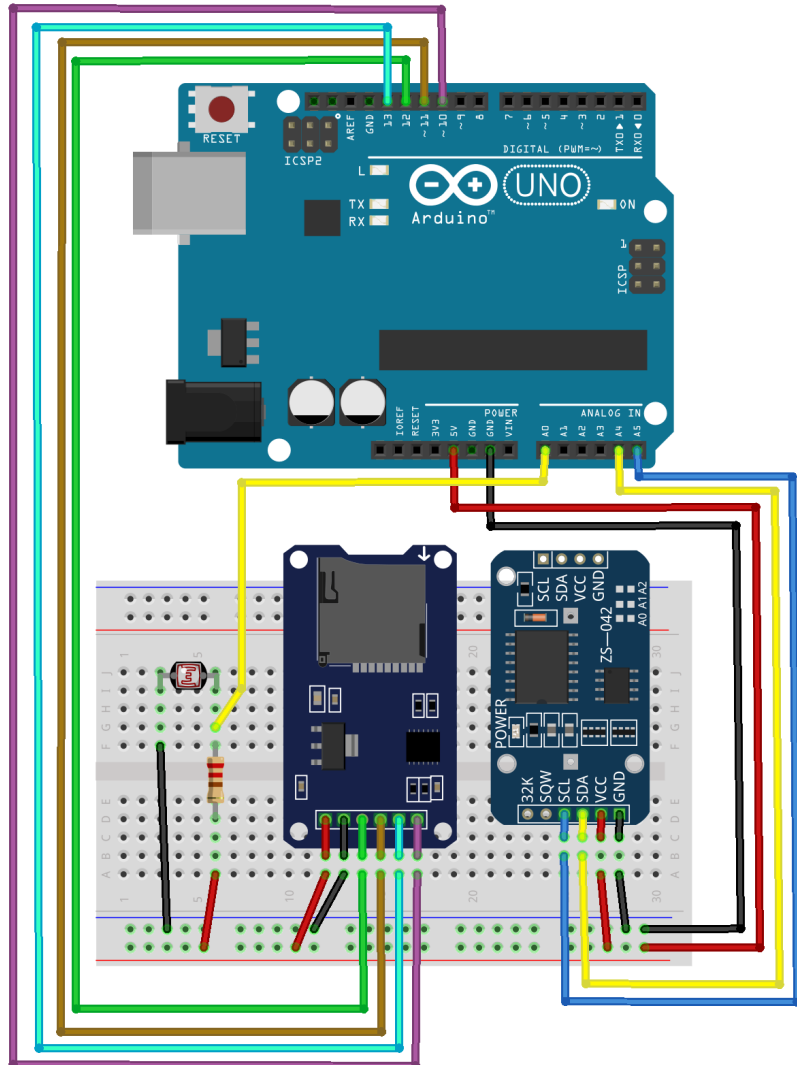
We will next have a look at a very simple LDR data logging example in order to understand how we record sensor values within the Arduino IDE. The code for this example can be found with this pdf and is named "AD3\_Code\_LDR.ino"



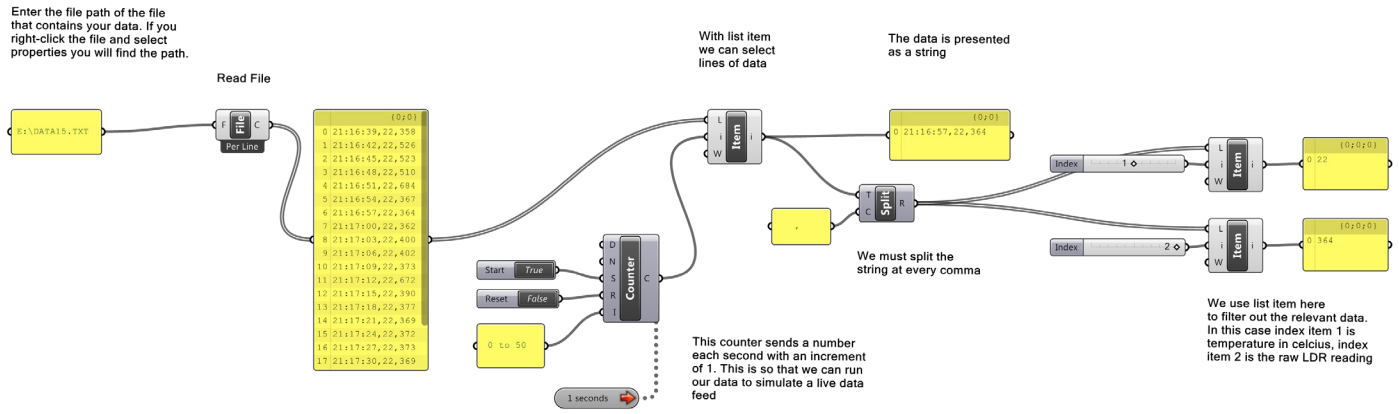
The final exercise will include an LDR, DS3231 and MicroSD module. This way we will log Time, Temperature and Light.

We have two sample codes for this example. The first one will log to one file name. Subsequent boots of the Arduino will add data to the end of the file. This code can be found with this pdf and is named "AD3\_Code\_MicroSD\_2.ino"

The other code saves to a new file name each boot. I believe this will be more useful. The code can be found with this pdf and is named "AD3\_Code\_MicroSD\_3.ino"



# USE .txt FILE IN GRASSHOPPER



This grasshopper sketch allows us to run a .txt file produced by our logging device. We can then use the output to influence a rhino/grasshopper model or we could feed it back to an Arduino using firefly.