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GPS-Tracker-1/)

(/id/How-to-Get-Sensor-Data-From-a-Remote-Arduino-Via-Wi-Fi/)

This is an example to show how to get sensor data from a remote Arduino via Wireless Lora Protocol (<http://www.lora-alliance.org/What-Is-LoRa/Technology>). The example requires the following hardware:

- 1) Client Side: Arduino + LoRa Shield (<http://www.dragino.com/products/module/item/102-lora-shield.html>) (868Mhz) + DS18B20 (Temperature Sensor).
- 2) Server Side: Arduino + LoRa Shield (<http://www.dragino.com/products/module/item/102-lora-shield.html>) (868Mhz) + Yun Shield (<http://www.dragino.com/products/yunshield.html>) + USB flash.

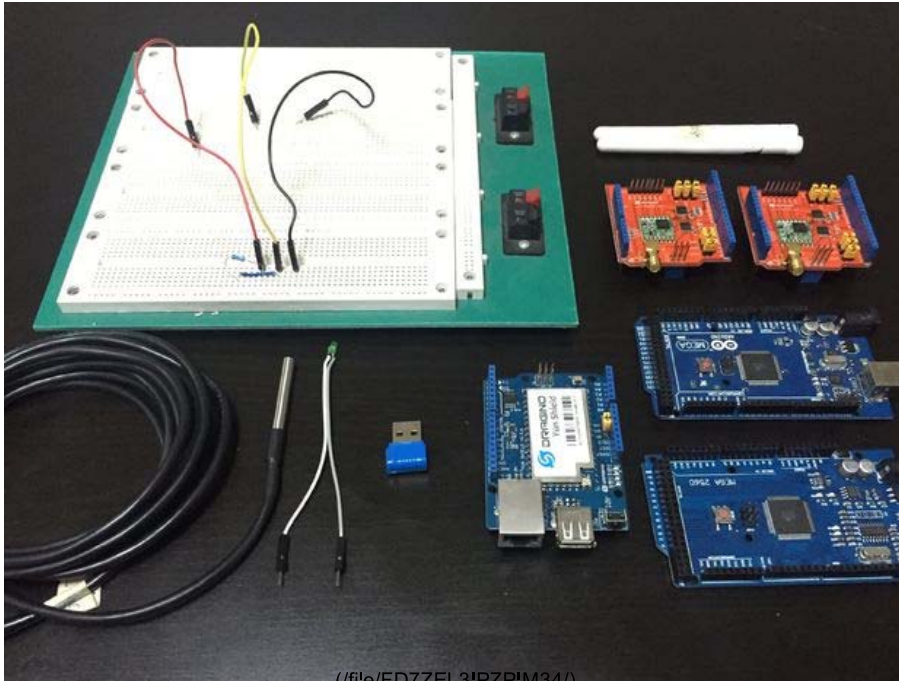
make sure the USB flash has this file `datalog.csv` in the data directory of root.

Require the following software: Radiohead library from:  
[http://www.airspayce.com/mikem/arduino/RadioHead/...](http://www.airspayce.com/mikem/arduino/RadioHead/)  
[\(http://www.airspayce.com/mikem/arduino/RadioHead/\)](http://www.airspayce.com/mikem/arduino/RadioHead/)

Client side will get the temperature and keep sending out to the server via Lora wireless. Server side will listen on the Lora wireless frequency, once it gets the data from Client side, it will turn on the LED and log the sensor data to a USB flash.

Follow the next operations to complete this project.

## Step 1: Preparations



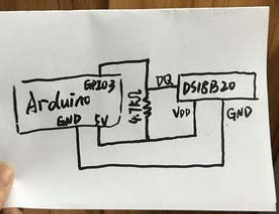
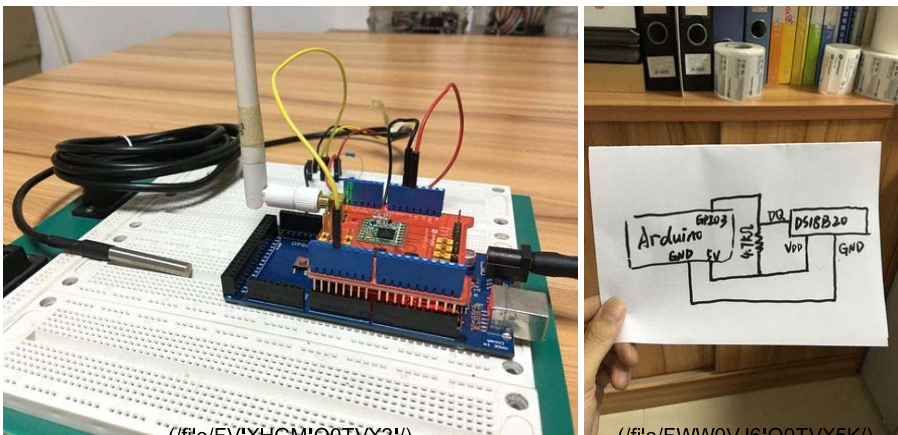
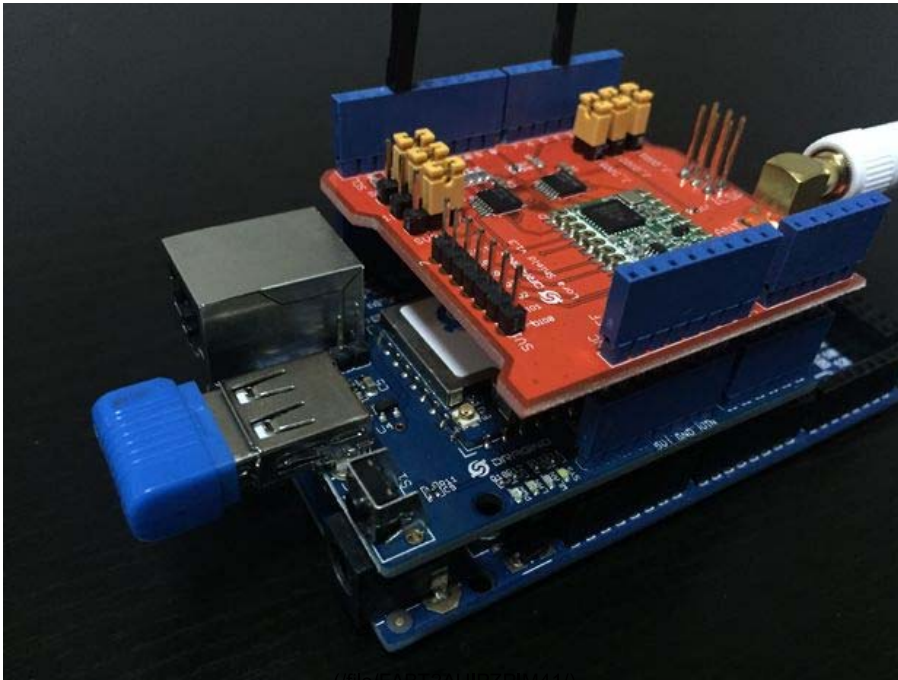
### In this project,you need the things below:

- Arduino board x 2 (We use the MEGA2560 here)
- Dragino Lora Shield v1.3 x 2 (We use 868MHZ here)
- Yun Shield v1.1.6 x 1
- USB flash x 1
- DS18B20 x 1 (Temperature sensor)
- Bread board x 1
- 868MHZ antenna x 2
- USB cable x 2
- LED x 2
- 4.7k resistance x 1
- Some jump wires
- Power supply

### Note:

About the Yun Shiled,we must use the Yun Shield v1.1.6/Yun Shield v2.2.4 or higher version

## Step 2: Connections



In this step, we need to assemble the client and the server separately. Follow above pictures, and make sure you got everything ready.

**NOTE:**

- The data wire is plugged into port 3 on the Arduino (Client)
- The LED is on the GPIO 4 (Server)
- Put the ant on the boards
- Create a directory named "data" in the USB flash root and create a file data.csv in this directory.

**Step 3: Codes**

```
get_temp_data_and_sent_to_the_Lora_Server
19
20 //
21 //Include required lib so Arduino can communicate with the temperature sensorDS18B20:
22 #include <OneWire.h>
23 #include <DallasTemperature.h>
24 // Singleton instance of the radio driver
25 #include <SPI.h>
26 #include <RM_RF95.h>
27 RM_RF95 rf95;
28
29 // Data wire is plugged into port 3 on the Arduino
30 #define ONE_WIRE_BUS 3
31
32 // Setup a oneWire instance to communicate with any OneWire devices (not just Maxim/Dallas temper
33 OneWire oneWire(ONE_WIRE_BUS);
34
35 // Pass our oneWire reference to Dallas Temperature.
36 DallasTemperature sensors(&oneWire);
37 float data;
38 String datastring="";
39 char databuff[10];
40 uint8_t dataoutgoing[10];
41 void setup()
42
Done Saving.
Invalid library found in D:\GMX\download\Arduino IDE\arduino-1.6.8\libraries\SoftSerialTest: D:\GMX\
Invalid library found in D:\GMX\download\Arduino IDE\arduino-1.6.8\libraries\SoftSerialTest: D:\GMX\
Invalid library found in D:\GMX\download\Arduino IDE\arduino-1.6.8\libraries\SoftSerialTest: D:\GMX\
The sketch name had to be modified. Sketch names can only consist
Arduino Mega 2560 - Dragino Yún on 172.31.255.264
```

```
get_data_from_lora_node_and_store_in_USB
22 //Include required lib so Arduino can talk with the Lora Shield
23 #include <SPI.h>
24 #include <RM_RF95.h>
25
26 //Include required lib so Arduino can communicate with Tun Shield
27 #include <FileIO.h>
28 #include <Console.h>
29
30 // Singleton instance of the radio driver
31 RM_RF95 rf95;
32 int led = 4;
33 int reset_lora = 9;
34 String dataString = "";
35
36 void setup()
37 {
38   pinMode(led, OUTPUT);
39   pinMode(reset_lora, OUTPUT);
40   Bridge.begin();
41   Console.begin();
42   FileSystem.begin();
43
44   // reset lora module first. to make sure it will works properly
45
Done Saving.
www.dragino.com
vvrduide done. Thank you.
Arduino Mega 2560 - Dragino Yún on 172.31.255.264
```

Power them by Power supply, and connect them to the computer via USB cable.

### Client

Open the IDE (Over here, we use the version 1.6.8), choose the correct port and correct board for your client. Upload the client sketch to the Arduino board, you can find the code here:

[https://github.com/dragino/Lora/blob/master/Lora%20Shield/Examples/Lora\\_Temperature\\_RadioHead/get\\_temp\\_data\\_and\\_sent\\_to\\_the\\_Lora\\_Server/get\\_temp\\_data\\_and\\_sent\\_to\\_the\\_Lora\\_Server.ino](https://github.com/dragino/Lora/blob/master/Lora%20Shield/Examples/Lora_Temperature_RadioHead/get_temp_data_and_sent_to_the_Lora_Server/get_temp_data_and_sent_to_the_Lora_Server.ino)

([https://github.com/dragino/Lora/blob/master/Lora%20Shield/Examples/Lora\\_Temperature\\_RadioHead/get\\_temp\\_data\\_and\\_sent\\_to\\_the\\_Lora\\_Server/get\\_temp\\_data\\_and\\_sent\\_to\\_the\\_Lora\\_Server.ino](https://github.com/dragino/Lora/blob/master/Lora%20Shield/Examples/Lora_Temperature_RadioHead/get_temp_data_and_sent_to_the_Lora_Server/get_temp_data_and_sent_to_the_Lora_Server.ino))

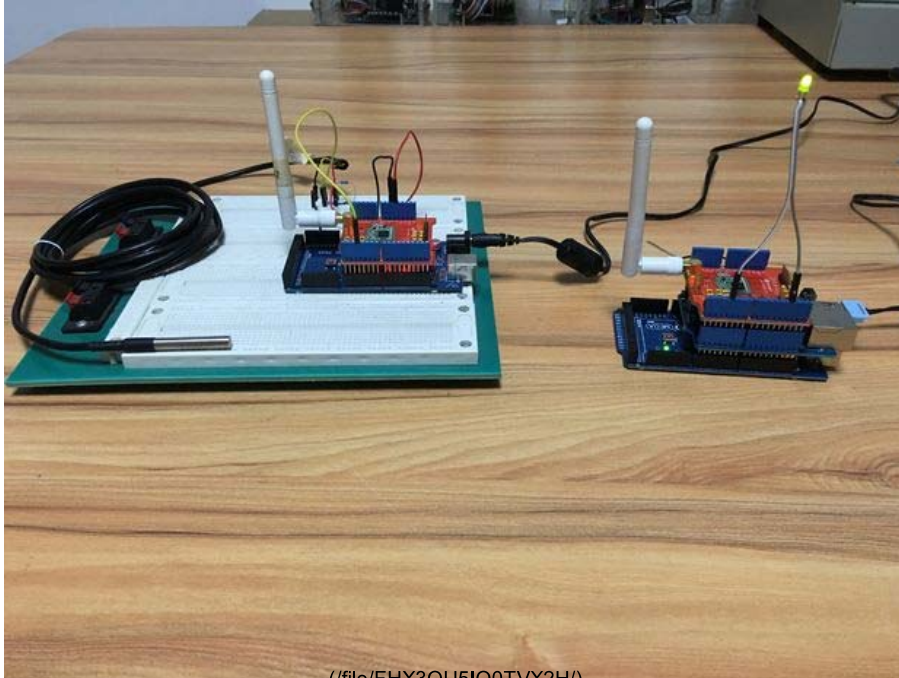
### Server

Upload the server sketch to the Arduino as above, you can find the code here:

[https://github.com/dragino/Lora/blob/master/Lora%20Shield/Examples/Lora\\_Temperature\\_RadioHead/get\\_data\\_from\\_lora\\_node\\_and\\_store\\_in\\_USB/get\\_data\\_from\\_lora\\_node\\_and\\_store\\_in\\_USB.ino](https://github.com/dragino/Lora/blob/master/Lora%20Shield/Examples/Lora_Temperature_RadioHead/get_data_from_lora_node_and_store_in_USB/get_data_from_lora_node_and_store_in_USB.ino)

([https://github.com/dragino/Lora/blob/master/Lora%20Shield/Examples/Lora\\_Temperature\\_RadioHead/get\\_data\\_from\\_lora\\_node\\_and\\_store\\_in\\_USB/get\\_data\\_from\\_lora\\_node\\_and\\_store\\_in\\_USB.ino](https://github.com/dragino/Lora/blob/master/Lora%20Shield/Examples/Lora_Temperature_RadioHead/get_data_from_lora_node_and_store_in_USB/get_data_from_lora_node_and_store_in_USB.ino))

## Step 4: Running Result



```
get message 08 10 38.00
send message 08 10 38.00
get message 08 11 38.00
send message 08 11 38.00
get message 08 12 38.00
send message 08 12 38.00
get message 08 13 38.00
send message 08 13 38.00
get message 08 14 38.00
send message 08 14 38.00
get message 08 15 38.00
send message 08 15 38.00
get message 08 16 38.00
send message 08 16 38.00
get message 08 17 38.00
send message 08 17 38.00
get message 08 18 38.00
send message 08 18 38.00
get message 08 19 38.00
send message 08 19 38.00
get message 08 20 38.00
send message 08 20 38.00
get message 08 21 38.00
send message 08 21 38.00
get message 08 22 38.00
send message 08 22 38.00
```

After the last step, you can see the LED on the server will flash once per second. Open the Serial Monitor of the client, you can see the temperature info obtained through the sensor and the communication between client and server. Open the Serial Monitor of the server, you can also get the server status.

Then, enter the USB flash by WinSCP ([http://wiki.dragino.com/index.php?title=Transfer\\_/\\_Edit\\_files\\_in\\_ms14](http://wiki.dragino.com/index.php?title=Transfer_/_Edit_files_in_ms14)). Open `"/mnt/sda1/data/datalog.csv"` and you will see the stored information (time stamp with the real-time temperature) as the last photo at this step.

## Step 5: Usage Notice of Lora Shield

You have to be aware that Radio link quality and performances are highly dependent of environment.

Better performances can be reached with:

- Outdoor environment.
- No obstacles.
- No high level radio interferer in the ISM 868MHz band.
- At least 1 meter above the ground.

Radio performances are degraded with:

- Obstacles: buildings, trees...
- Inner buildings environments.
- High ISM 868MHz band usage by other technologies.

Radio communication are usually killed with bad topographic conditions. It is usually not possible to communicate through a hill, even very small.



## Step 6: Reference Protocol

by David\_Dragino (/member/David\_Dragino/) in arduino (/tag/type-id/category-technology/channel-arduino/)

1. Lora Shield: [http://wiki.dragino.com/index.php?title=Lora\\_Shield...](http://wiki.dragino.com/index.php?title=Lora_Shield...)

([http://wiki.dragino.com/index.php?title=Lora\\_Shield...](http://wiki.dragino.com/index.php?title=Lora_Shield...))

6 Steps ▶

2. Lora Shield Hardware Source:

<https://github.com/dragino/Lora/tree/master/Lora%...>

+ Collection

I Made it!

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(<https://github.com/dragino/Lora/tree/master/Lora%20Shield>)

3. Dragino Yun Shield: [http://wiki.dragino.com/index.php?title=Yun\\_Shield...](http://wiki.dragino.com/index.php?title=Yun_Shield...)

([http://wiki.dragino.com/index.php?title=Yun\\_Shield...](http://wiki.dragino.com/index.php?title=Yun_Shield...))

4. Log sensor data to USB flash: [http://wiki.dragino.com/index.php?title=Arduino\\_Yu...](http://wiki.dragino.com/index.php?title=Arduino_Yu...)

([http://wiki.dragino.com/index.php?title=Arduino\\_Yu...](http://wiki.dragino.com/index.php?title=Arduino_Yu...))

([http://wiki.dragino.com/index.php?title=Arduino\\_Yun\\_examples#Log\\_sensor\\_data\\_to\\_USB\\_flash](http://wiki.dragino.com/index.php?title=Arduino_Yun_examples#Log_sensor_data_to_USB_flash))

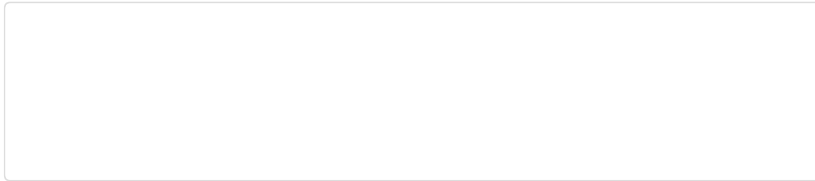
5. DS18B20: <http://datasheets.maximintegrated.com/en/ds/DS18B2...>

(<http://datasheets.maximintegrated.com/en/ds/DS18B20.pdf>)

6. Dallas Semiconductor's 1-Wire Protocol:

<http://playground.arduino.cc/Learning/OneWire>

(<http://playground.arduino.cc/Learning/OneWire>)



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👏 I Made it!

📷 Add Images

Post Comment



**BrandonF42** (/member/BrandonF42)

a month ago

Reply

I am looking at doing a similar project but using cellular. Any advice on shields, boards to use for this?



**David\_Dragino** (/member/David\_Dragino) (author) ▶ BrandonF42

(/member/BrandonF42)

22 days ago

Reply

Did you make it? Could you tell me more details?



**David\_Dragino** (/member/David\_Dragino) (author)

3 months ago

Reply

Yes, you can use the Uno board, but the Mega2560 could be better, the Mega2560 have more RAM space for the code



**JiwonC** (/member/JiwonC)

6 months ago

Reply

Can I use Arduino uno instead of Arduino MEGA 2560 board at this project?



**victor.feria.75** (/member/victor.feria.75)

6 months ago

Reply

I just ordered the LoRa/Shield Module for Arduino. Do I need to preconfigure the LoRas prior to installing the mods to Arduino?



**David\_Dragino** (/member/David\_Dragino) (author) ▶ victor.feria.75

(/member/victor.feria.75)

6 months ago

Reply

Hi,victor,  
It's a plug and play board,you don't need take any change in this project.If  
there is any other problem,you can contact us by support@dragino.com  
Cheers



## How to get sensor data from a remote Arduino via Wireless Lora

Protocol by David\_Dragino (/member/David\_Dragino) (author) in arduino (/tag/type-id/category-technology/channel-arduino/) 7 months ago [Reply](#)

Hi,all,  
[Download](#) [\(/id/How-to-Get-Sensor-Data-From-a-Remote-Arduino-Via-W/\)](#) [6 Steps](#) [▶](#)

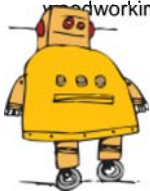
There is another useful expansion LoRa board for RPi: [LoRa/GPS\\_HAT](#) [Collection](#) [I Made it!](#) [Favorite](#) [Share](#) [▶](#)

**David\_Dragino (/member/David\_Dragino)** (author) ▶ David\_Dragino  
(/member/David\_Dragino) 7 months ago [Reply](#)

**The product link:** [http://wiki.dragino.com/index.php?title=Lora/GPS\\_HAT](http://wiki.dragino.com/index.php?title=Lora/GPS_HAT)  
([http://wiki.dragino.com/index.php?title=Lora/GPS\\_HAT](http://wiki.dragino.com/index.php?title=Lora/GPS_HAT))

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