

## Temperature Sensor Project

## What you need:

- Raspberry Pi all models
- DS18B20 sensor(s), one per temperature reading you want (GEAR has 10 in stock)
- 4.7k resistor (GEAR has plenty)
- Jumper wire cables and breadboard or wire, soldering iron and solder

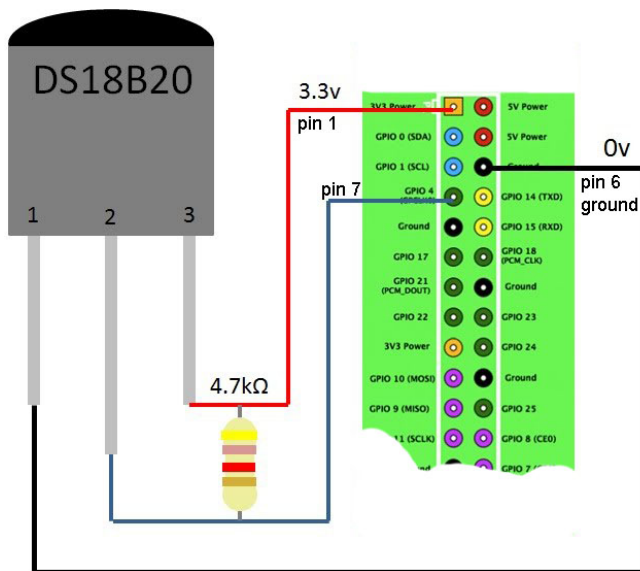


Figure 1 wiring the sensor to RPi

Wire the DS18B20 digital temperature sensor to the Raspberry Pi according to wiring diagram in Figure 1. You can use a breadboard. Alternatively, for a more permanent set up you could mount the sensor and resistor to a small square of circuit board and solder jumper cables to the sensor and resistor.

Now you need to edit a file on the RPi to make the sensor work.

1. open the terminal window
2. type this: `sudo nano /boot/config.txt`
3. use the down arrow on keyboard to move the cursor down to bottom of the text
4. with the cursor below all lines of text, type in two lines of text exactly as given in steps 5 and 6 (without step number)
5. # 1-wire settings
6. `dtoverlay=w1-gpio,gpiopin=4`
7. Press Ctrl and X keys together to exit the editing mode, be sure to press Y next followed by the ENTER key to save and exit.
8. type this: `cat /boot/config.txt`
9. when you do step 8, the contents of the file named config.txt will be displayed. Make sure that the two lines of text you added to the file are correct
10. Reboot your RPi
11. open the terminal window and type in text of steps 12 through 15
12. `sudo modprobe w1-gpio`
13. `sudo modprobe w1-therm`
14. `cd /sys/bus/w1/devices/`

## 15. ls

You will see a listing of the current directory. There should be a sub-directory listed that is the serial number of your temperature sensor. The serial number of one of GEAR's sensors is 28-0000093b782d, but every sensor will have a unique number. Write down your sensor number in your notebook as you will need it later in these instructions.

If you don't see a directory with lots of numbers and letters like the one above then:

- Check your circuit wiring.
- Make sure you have the correct resistor (this is very important - yellow, violet, red, gold).
- Feel the temperature gauge with your finger. If it feels hot then you have it wired back to front.

If you do see the directory then type cd followed by the directory name:

```
cd 28-0000093b782d [this is an example, use your sensor number instead]
```

```
cat w1_slave
```

The contents of the w1\_slave file will now appear in the terminal window. The text includes the temperature data in Celsius (see example below). 25312 is 25.312 degrees Celsius.

Example text of the w1\_slave file:

```
95 01 4b 46 7f ff 0b 10 0b : crc=0b YES  
95 01 4b 46 7f ff 0b 10 0b f=25312
```

## Register user and password

Now that you have confirmed your temperature sensor is working, you can post the temperature on the Internet. You will use a service named PrivateEyePi, which is a free service. You will need an email address to create an account with this service. If you don't already have an email address, then you will need to create one. If your parents don't want you to have an email address, then let Mr. La Favre know and you can use his account temporarily.

If you have not yet registered a user and password with PrivateEyePi follow the following steps.

1. Go to [www.privateeyepi.com](http://www.privateeyepi.com)
2. Click on "New User" option top right of the screen.
3. Enter your details on the screen and click update

## Configure GPIO 4

This configuration tells the system that you have connected a temperature sensor to GPIO 4 and to display it on your dashboard.

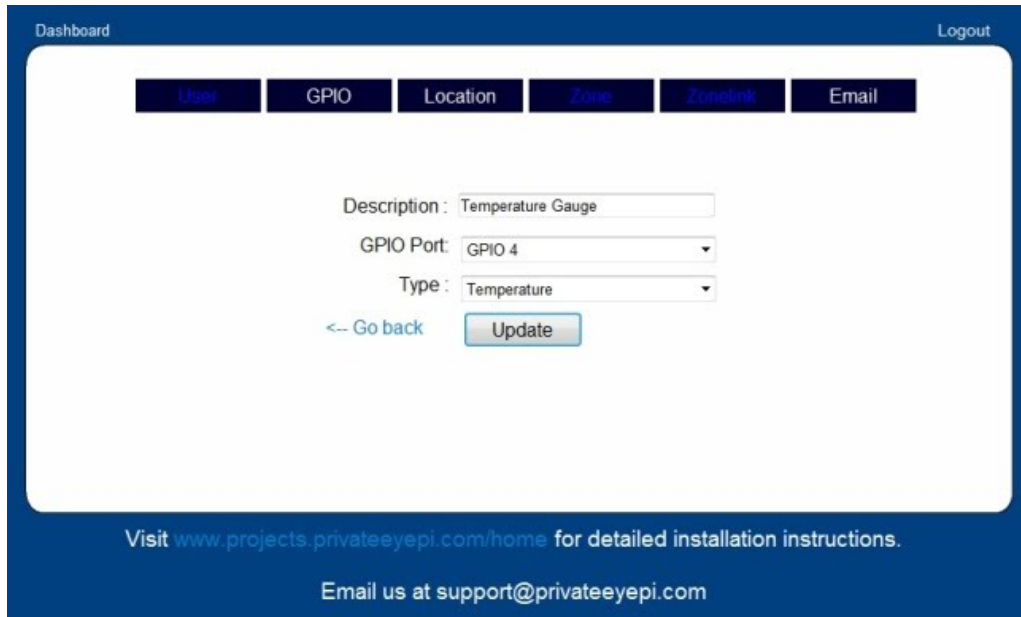
- As per Figure 2 click on the GPIO menu option
- Click "Add"
- Type 7 in the "number" field
- Give it a Description of "GPIO 4", or anything else you like
- Click "Update"



The screenshot shows a web dashboard with a dark blue header and footer. The header contains the word "Dashboard" on the left and "Logout" on the right. Below the header is a navigation bar with six buttons: "User", "GPIO", "Location", "Zone", "ZoneList", and "Email". The "GPIO" button is highlighted. The main content area is white and contains a form with two input fields: "Number : 7" and "Description : GPIO 4". Below the fields are two buttons: "<-- Go back" and "Update". The footer contains the text "Visit [www.projects.privateeyepi.com/home](http://www.projects.privateeyepi.com/home) for detailed installation instructions." and "Email us at [support@privateeyepi.com](mailto:support@privateeyepi.com)".

Figure 2

- As per Figure 3 click the "Location" menu item
- Enter a Description, e.g. "Temperature Gauge"
- Select GPIO Port 4
- Select Type "Temperature"
- Click "Update"



Dashboard Logout

[Home](#) [GPIO](#) [Location](#) [Zone](#) [ZoneLink](#) [Email](#)

Description:

GPIO Port:

Type:

[<- Go back](#)

Visit [www.projects.privateeyepi.com/home](http://www.projects.privateeyepi.com/home) for detailed installation instructions.

Email us at [support@privateeyepi.com](mailto:support@privateeyepi.com)

Figure 3

## Install PrivateEyePi software on the RPi

Next install PrivateEyePi by downloading the install shell script and running it. Type the following two commands at the command prompt in the Terminal window:

```
cd /home
```

```
sudo wget -N www.privateeyepi.com/downloads/install.sh
```

Now run the install by typing the following command.

```
sudo sh install.sh
```

## Configure the Program

Type the following commands:

```
cd /home
```

```
sudo nano globals.py
```

Near the top of the file you will see:

```
user= ""
```

```
password=""
```

Edit these two lines with the email address and password you used to register earlier.

For example:

```
user= "your@email.com"
```

```
password="ilovemypi"
```

Move the cursor down until you see the DallasSensorNumber settings (as per Figure 4). You need to place the GPIO pin number that you configured previously (Figure 3) in between the parentheses (change the number 7 to the number 4, which is the GPIO number you have connected the sensor to ). Then change the directory name of the w1\_slave file to match the name for your sensor.

```

GNU nano 2.2.6 File: globals.py

#Indicator to record temperature in Farenheit
Fahrenheit=False

#Temperature poll interval in seconds
TemperaturePollInterval=300

#Temperature settings
DallasSensorNumbers = []
DallasSensorDirectory = []

#Set the directory and sensor numbers for the Dallas
DallasSensorNumbers.append(7)
DallasSensorNumbers.append(89) #add more sensors..
DallasSensorNumbers.append(88) #add more sensors..

DallasSensorDirectory.append("28-0000053b7539")
DallasSensorDirectory.append("28-0000053c0b71") #add another directory
DallasSensorDirectory.append("28-000004abe2b6") #add another directory

^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell

```

Figure 4

This completes the necessary editing of the globals.py file. Press Ctrl and X keys together, then press Y key followed by Enter key to save your changes and exit the nano editing software.

## Run `dallas.py` program

At the terminal window command prompt type:

```
cd /home
```

```
sudo python dallas.py
```

Your RPi will now send temperature data to the PrivateEyePi temperature logging service. Now you will log on to that service, which you can do from any location worldwide where there is Internet service.

## View your Temperature readings at the PrivateEyePi web site

Go to [www.privateeyepi.com](http://www.privateeyepi.com)

Log in, or click on the "Dashboard" link on top left

You should now see the temperature displayed