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Topic: Help needed with multiple conditions in Greenhouse project (Read 6576 times)[Previous Topic](http://forum.arduino.cc/index.php?topic=269938.0;prev_next=prev" \l "new) - [Next Topic](http://forum.arduino.cc/index.php?topic=269938.0;prev_next=next#new)

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[**amerko**](http://forum.arduino.cc/index.php?action=profile;u=50891)

* Newbie
* Posts: 11
* Karma: 0  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=50891;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902601#msg1902601)

[**Sep 30, 2014, 08:03 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902601#msg1902601)

Dear Arduino users,  
  
since this is my first post, even though I have read and enjoyed in many posts here at the forum, where I have found plenty useful information, since I started to use arduino, I am not sure if I posted in right place.  
  
However, I am preparing usage of arduino in existing greenhouse, which is currently controlled by PLC, but with simple controls. Motors (24V) are already in place with DPDT relays for start and direction change, and only control is done using mentioned PLC with temperature sensors for opening and closing the sidewall curtains.  
  
My idea is to have following sensors for input: temperature, humidity, soil moisture, light, etc, and to be able to control motors to open the sidewall curtains, fans, sprinklers, light, watering, etc. And of course, to be able to control it via web interface and mobile devices. Some of mentioned idea are for the upgraded versions, but right now I need to have it running/controlling properly.  
  
Project is based on already purchased: Arduino Mega, sensor shield, relay board, Ethernet shield, sensors, solenoid valves.  
  
Code that I have prepared is working properly when using individual for different sensors and outputs.  
  
However, I am currently experiencing some problems when using multiple conditions if some output is previously HIGH. I am sure that this might be trivial issue, and I have missed some obvious "rule" when writing the code, but I have spent hours reading materials and testing, but simply I cannot found solution.  
  
Concrete problem is when output 2 (that controls the fan) is HIGH previously triggered by temp sensor, and when than when humidity is above set condition, and tries to write HIGH again to the same output, output pin on relay board is flickering.  
  
Again, I am sure that this is trivial, and I need to revise my code again, I would really appreciate some guide on how to solve this problem.  
  
Please found below my code:

Code: [[Select]](javascript:void(0);)

#include <OneWire.h>  
#include "DHT.h"  
#include <DallasTemperature.h>  
  
OneWire oneWire(18);  
  
#define DHTPIN 21   
#define DHTTYPE DHT22  
  
#define RELAY\_ON 0  
#define RELAY\_OFF 1  
  
#define Relay\_1  14  // Arduino Digital Output pins for relay 1 - DPDT relay for motor control  
#define Relay\_2  15  // Arduino Digital Output pins for relay 2 - Fan  
#define Relay\_3  16  // Arduino Digital Output pins for relay 3 - Sprinkler  
#define Relay\_4  17  // Arduino Digital Output pins for relay 4 - Pump  
  
int setpointD = 18; // Reference Temperature for sensor Dallas DS18B20   
int thresholdD = 7; // Temperature difference for sensor Dallas DS18B20   
  
int setpointDHT = 18; // Reference Temperature for sensor DHT22  
int thresholdDHT = 7; // Temperature difference for sensor  Dallas DHT22  
  
DallasTemperature sensors(&oneWire);  
DHT dht(DHTPIN, DHTTYPE);  
  
void setup()  
{  
  sensors.begin();  
  Serial.begin(9600);  
  
  //-------( Initialize Pins so relays are inactive at reset)----  
  digitalWrite(Relay\_1, RELAY\_OFF);  
  digitalWrite(Relay\_2, RELAY\_OFF);  
  digitalWrite(Relay\_3, RELAY\_OFF);  
  digitalWrite(Relay\_4, RELAY\_OFF);    
  
  //---( THEN set pins as outputs )----    
  pinMode(Relay\_1, OUTPUT);     
  pinMode(Relay\_2, OUTPUT);    
  pinMode(Relay\_3, OUTPUT);    
  pinMode(Relay\_4, OUTPUT);      
  delay(4000); //Check that all relays are inactive at Reset  
  
  dht.begin();  
  
}  
void loop()  
  
{  
  sensors.requestTemperatures();  
  float currentTempDallas1;  
  currentTempDallas1 = sensors.getTempCByIndex(0);  
  float h = dht.readHumidity();  
  float t = dht.readTemperature();  
  
  //Condition for triggering motor for opening sidewall curtains using relay 1, which should be initiated if either of temp sensors is higher than set value  
  if (currentTempDallas1 > setpointD+thresholdD || t > setpointDHT+thresholdDHT)  
  {  
    digitalWrite(Relay\_1, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Sidewall curtains up");  
    Serial.print("\t");  
  }  
  if (currentTempDallas1 < setpointD || t < setpointDHT)  
  {  
    digitalWrite(Relay\_1, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Sidewall curtains down");  
    Serial.print("\t");  
  }  
  
  //Condition for triggering the fan using relay 2, which should be initiated if either of temp sensors or humidity is higher than set value  
  if (currentTempDallas1 > setpointD+thresholdD || h > 75)  
  {  
    digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Fan ON");  
    Serial.print("\t");  
  }  
  if (currentTempDallas1 < setpointDHT || h < 75)  
  {  
    digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Fan OFF");  
    Serial.print("\t");  
  }  
  
  //Condition for triggering the sprinkler using relay 3, which should be initiated if humidity is higher than set value  
  if (h > 90)  
  {  
    digitalWrite(Relay\_3, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Sprinkler ON");  
    Serial.print("\t");  
  }  
  else  
  {  
    digitalWrite(Relay\_3, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Sprinkler OFF");  
    Serial.print("\t");  
  }  
  
    Serial.print("\t");  
    Serial.print("Temperature Dallas1: ");  
    Serial.print("\t");  
    Serial.println(currentTempDallas1,2);  
  
  if (isnan(t) || isnan(h)) {  
    Serial.println("Failed to read from DHT");  
  }   
  else {  
    Serial.print("Humidity: ");   
    Serial.print(h);  
    Serial.print(" %\t");  
    Serial.print("Temperature: ");   
    Serial.print(t);  
    Serial.println(" \*C");  
  }  
  delay(1000);  
}  
  
  
I have tried some solution I have found using case/switch but couldn't get it working and also some solution with simple if statements for different scenarios writing either HIGH or LOW, but each time arduino goes through the loop, it "clicks" trying to set pin even if it had same state as requested, which is not goo solution at all.  
  
Also, I think that this arduino community if one of the greatest I have seen :-)  
  
Many thanks again.  
  
A

[**robtillaart**](http://forum.arduino.cc/index.php?action=profile;u=22951)

* **Global Moderator**
* Brattain Member
* Posts: 18,285
* Karma: 1029  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=22951;ab2c6e6=8004d12ce998863981e062c4dd60f699)
* In theory there is no difference between theory and practice, however in practice there are many...

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902604#msg1902604)

**#1**

[**Sep 30, 2014, 08:08 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902604#msg1902604)

use of extra ()  might be wise as I never trust the precedence of operators ...  
  
  if (currentTempDallas1 > setpointD+thresholdD || t > setpointDHT+thresholdDHT)  
  
==>  
  
  if ( ( currentTempDallas1 > (setpointD+thresholdD))  ||  (t > (setpointDHT+thresholdDHT) ) )   
  
etc  
  
  
furthermore if you use  h<75 in one place you might need  h>= 75 in the other?

Rob Tillaart  
  
Nederlandse sectie - http://arduino.cc/forum/index.php/board,77.0.html -  
(Please do not PM for private consultancy)

[**amerko**](http://forum.arduino.cc/index.php?action=profile;u=50891)

* Newbie
* Posts: 11
* Karma: 0  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=50891;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902614#msg1902614)

**#2**

[**Sep 30, 2014, 08:24 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902614#msg1902614)

Dear Rob,  
  
many thanks for your prompt reply and your involvement, as sincerely, I have read many of your topics and replies to the topics, and really enjoyed it and learned a lot from it, so I do appreciate your help.  
  
I will try this now and test it, but with some values more realistic to trigger the change in my room now using my fingers and breath  :-)  
  
With regards to humidity condition I hoped I got it covered at the beginning of if statement:  
  
  //Condition for triggering the fan using relay 2, which should be initiated if either of temp sensors or humidity is higher than set value  
  if (currentTempDallas1 > setpointD+thresholdD || **h > 75**)  
  {  
    digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Fan ON");  
    Serial.print("\t");  
  }  
  if (currentTempDallas1 < setpointD || h < 75)  
  {  
    digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Fan OFF");  
    Serial.print("\t");  
  }  
  
I have just noticed that I used setpoint of DHT sensor so I have changed it, but I would eventually add both temp sensors in the condition, when I get this working.  
  
Do you think it is set properly or do use need to use some "indirect" container for storing current values?   
  
Thanks again.

[**robtillaart**](http://forum.arduino.cc/index.php?action=profile;u=22951)

* **Global Moderator**
* Brattain Member
* Posts: 18,285
* Karma: 1029  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=22951;ab2c6e6=8004d12ce998863981e062c4dd60f699)
* In theory there is no difference between theory and practice, however in practice there are many...

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902623#msg1902623)

**#3**

[**Sep 30, 2014, 08:35 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902623#msg1902623)

first get the sensors working, can you check it ?

Code: [[Select]](javascript:void(0);)

#include <OneWire.h>  
#include "DHT.h"  
#include <DallasTemperature.h>  
  
OneWire oneWire(18);  
  
#define DHTPIN 21   
#define DHTTYPE DHT22  
  
#define RELAY\_ON 0  
#define RELAY\_OFF 1  
  
#define Relay\_1  14  // Arduino Digital Output pins for relay 1 - DPDT relay for motor control  
#define Relay\_2  15  // Arduino Digital Output pins for relay 2 - Fan  
#define Relay\_3  16  // Arduino Digital Output pins for relay 3 - Sprinkler  
#define Relay\_4  17  // Arduino Digital Output pins for relay 4 - Pump  
  
int setpointD = 18; // Reference Temperature for sensor Dallas DS18B20   
int thresholdD = 7; // Temperature difference for sensor Dallas DS18B20   
  
int setpointDHT = 18; // Reference Temperature for sensor DHT22  
int thresholdDHT = 7; // Temperature difference for sensor  Dallas DHT22  
  
DallasTemperature sensors(&oneWire);  
DHT dht(DHTPIN, DHTTYPE);  
  
void setup()  
{  
  sensors.begin();  
  Serial.begin(9600);  
  
  //-------( Initialize Pins so relays are inactive at reset)----  
  digitalWrite(Relay\_1, RELAY\_OFF);  
  digitalWrite(Relay\_2, RELAY\_OFF);  
  digitalWrite(Relay\_3, RELAY\_OFF);  
  digitalWrite(Relay\_4, RELAY\_OFF);    
  
  //---( THEN set pins as outputs )----    
  pinMode(Relay\_1, OUTPUT);     
  pinMode(Relay\_2, OUTPUT);    
  pinMode(Relay\_3, OUTPUT);    
  pinMode(Relay\_4, OUTPUT);      
  
  delay(4000); //Check that all relays are inactive at Reset  
  
  dht.begin();  
  
}  
void loop()  
  
{  
  sensors.requestTemperatures();  
  float currentTempDallas1 = sensors.getTempCByIndex(0);  
  float h = dht.readHumidity();  
  float t = dht.readTemperature();  
  
  Serial.println(currentTempDallas1 , 1);  
  Serial.println(h, 1);  
  Serial.println(t, 1);  
  
  delay(2000);  
}

Rob Tillaart  
  
Nederlandse sectie - http://arduino.cc/forum/index.php/board,77.0.html -  
(Please do not PM for private consultancy)

[**robtillaart**](http://forum.arduino.cc/index.php?action=profile;u=22951)

* **Global Moderator**
* Brattain Member
* Posts: 18,285
* Karma: 1029  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=22951;ab2c6e6=8004d12ce998863981e062c4dd60f699)
* In theory there is no difference between theory and practice, however in practice there are many...

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902631#msg1902631)

**#4**

[**Sep 30, 2014, 08:44 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902631#msg1902631)

small patch to your code,

Code: [[Select]](javascript:void(0);)

#include <OneWire.h>  
#include "DHT.h"  
#include <DallasTemperature.h>  
  
OneWire oneWire(18);  
  
#define DHTPIN 21   
#define DHTTYPE DHT22  
  
#define RELAY\_ON 0  
#define RELAY\_OFF 1  
  
#define Relay\_1  14  // Arduino Digital Output pins for relay 1 - DPDT relay for motor control  
#define Relay\_2  15  // Arduino Digital Output pins for relay 2 - Fan  
#define Relay\_3  16  // Arduino Digital Output pins for relay 3 - Sprinkler  
#define Relay\_4  17  // Arduino Digital Output pins for relay 4 - Pump  
  
int setpointD = 18; // Reference Temperature for sensor Dallas DS18B20   
int thresholdD = 7; // Temperature difference for sensor Dallas DS18B20   
  
int setpointDHT = 18; // Reference Temperature for sensor DHT22  
int thresholdDHT = 7; // Temperature difference for sensor  Dallas DHT22  
  
DallasTemperature sensors(&oneWire);  
DHT dht(DHTPIN, DHTTYPE);  
  
void setup()  
{  
  sensors.begin();  
  Serial.begin(9600);  
  
  //-------( Initialize Pins so relays are inactive at reset)----  
  digitalWrite(Relay\_1, RELAY\_OFF);  
  digitalWrite(Relay\_2, RELAY\_OFF);  
  digitalWrite(Relay\_3, RELAY\_OFF);  
  digitalWrite(Relay\_4, RELAY\_OFF);    
  
  //---( THEN set pins as outputs )----    
  pinMode(Relay\_1, OUTPUT);     
  pinMode(Relay\_2, OUTPUT);    
  pinMode(Relay\_3, OUTPUT);    
  pinMode(Relay\_4, OUTPUT);      
  delay(4000); //Check that all relays are inactive at Reset  
  
  dht.begin();  
  
}  
void loop()  
  
{  
  sensors.requestTemperatures();  
  float currentTempDallas1;  
  currentTempDallas1 = sensors.getTempCByIndex(0);  
  float h = dht.readHumidity();  
  float t = dht.readTemperature();  
  
  // Condition for triggering motor for opening sidewall curtains using relay 1,   
  // which should be initiated if either of temp sensors is higher than set value  
  if ((currentTempDallas1 > (setpointD + thresholdD)) || (t > (setpointDHT + thresholdDHT)))  
  {  
    digitalWrite(Relay\_1, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Sidewall curtains up");  
    Serial.print("\t");  
  }  
  else  
  {  
    digitalWrite(Relay\_1, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Sidewall curtains down");  
    Serial.print("\t");  
  }  
  
  // Condition for triggering the fan using relay 2,   
  // which should be initiated if either of temp sensors or humidity is higher than set value  
  if ( (currentTempDallas1 > setpointD+thresholdD) || (h > 75) )  
  {  
    digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Fan ON");  
    Serial.print("\t");  
  }  
  else  
  {  
    digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Fan OFF");  
    Serial.print("\t");  
  }  
  
  // Condition for triggering the sprinkler using relay 3,   
  // which should be initiated if humidity is higher than set value  
  if (h > 90)  
  {  
    digitalWrite(Relay\_3, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Sprinkler ON");  
    Serial.print("\t");  
  }  
  else  
  {  
    digitalWrite(Relay\_3, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Sprinkler OFF");  
    Serial.print("\t");  
  }  
  Serial.println();  
  
  delay(10000);  
}

Rob Tillaart  
  
Nederlandse sectie - http://arduino.cc/forum/index.php/board,77.0.html -  
(Please do not PM for private consultancy)

[**amerko**](http://forum.arduino.cc/index.php?action=profile;u=50891)

* Newbie
* Posts: 11
* Karma: 0  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=50891;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902649#msg1902649)

**#5**

[**Sep 30, 2014, 08:55 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902649#msg1902649)

As you might noticed, I have set the same condition for both relay 1 and 2 just to check if it would trigger the relay, and it should be changed to higher temp value.  
  
However, now Relay 1 is HIGH and Relay 2 is just flickering as it goes through loop, please see picture attached.  
  
  
  
Also, see print from serial:  
  
   Sidewall curtains up      Fan ON      Fan OFF      Sprinkler OFF      Temperature Dallas1:    26.75  
Humidity: 50.80 %   Temperature: 22.50 \*C  
  
But when humidity is higher, than both Relay 1 and Relay 2 is HIGH:  
  
   Sidewall curtains up      Fan ON      Sprinkler OFF      Temperature Dallas1:    28.81  
Humidity: 58.80 %   Temperature: 23.00 \*C

[2014-09-30 20.43.56-4.jpg](http://forum.arduino.cc/index.php?action=dlattach;topic=269938.0;attach=98206)   
195.37 KB  
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[**dlloyd**](http://forum.arduino.cc/index.php?action=profile;u=204741)

* Faraday Member
* Posts: 3,357
* Karma: 583  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=204741;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902650#msg1902650)

**#6**

[**Sep 30, 2014, 08:55 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902650#msg1902650)

Quote

*Concrete problem is when output 2 (that controls the fan) is HIGH previously triggered by temp sensor, and when than when humidity is above set condition, and tries to write HIGH again to the same output, output pin on relay board is flickering.*

I would suggest only writing to any output (changing the relay status) when a condition BECOMES true, not when it IS true ... similar to the Blink without Delay example. Therefore, your triggers would become "one-shot" and the code would never waste time repetetively writing to outputs that don't need to be changed. As a bonus, you would be able to eliminate using delay() during which inputs cannot be monitored and code cannot be processed.  
  
Some pseudo code that could be simplified or combined:

Code: [[Select]](javascript:void(0);)

  //Condition for triggering the fan using relay 2, initiated if any temp sensor is higher than set value  
  if ((currentTempDallas1 > setpointD + thresholdD) && (previousTempDallas1 <= setpointD + thresholdD))  
  {  
    digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Fan ON");  
    Serial.print("\t");  
  }  
  if ((currentTempDallas1 < setpointDHT) && (previousTempDallas1 >= setpointDHT))  
  {  
    digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Fan OFF");  
    Serial.print("\t");  
  }  
  
  //Condition for triggering the fan using relay 2, initiated if humidity sensor is higher than set value  
  if ((h > 75) && (hPrevious <= 75))  
  {  
    digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Fan ON");  
    Serial.print("\t");  
  }  
  if ((h < 75) && (hPrevious >= 75))  
  {  
    digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Fan OFF");  
    Serial.print("\t");  
  }

[**robtillaart**](http://forum.arduino.cc/index.php?action=profile;u=22951)

* **Global Moderator**
* Brattain Member
* Posts: 18,285
* Karma: 1029  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=22951;ab2c6e6=8004d12ce998863981e062c4dd60f699)
* In theory there is no difference between theory and practice, however in practice there are many...

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902660#msg1902660)

**#7**

[**Sep 30, 2014, 09:00 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902660#msg1902660)

Quote

*Fan ON      Fan OFF*

that means that both conditions are true

Code: [[Select]](javascript:void(0);)

if (currentTempDallas1 > setpointD+thresholdD || h > 75)  <<<<<<<<<<<<< TRUE  
  {  
    digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Fan ON");  
    Serial.print("\t");  
  }  
  if (currentTempDallas1 < setpointD || h < 75)  <<<<<<<<<<<<< TRUE  
  {  
    digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Fan OFF");  
    Serial.print("\t");  
  }  
that can be that the first condition  the dallastemp is TRue and in the other the humidity part is true.  
==> your logic fails.

Rob Tillaart  
  
Nederlandse sectie - http://arduino.cc/forum/index.php/board,77.0.html -  
(Please do not PM for private consultancy)

[**amerko**](http://forum.arduino.cc/index.php?action=profile;u=50891)

* Newbie
* Posts: 11
* Karma: 0  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=50891;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902727#msg1902727)

**#8**

[**Sep 30, 2014, 10:11 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902727#msg1902727)

Sorry for this later reply, but my baby daughter came home, and I had to put her to sleep.  
  
I must say that I feel stupid now :-) , but I assumed from the beginning that I have missed something. Originally, I've wrote real values on piece of paper, but with many tests and changes I have missed logic.  
  
I would now test it with some values and also using your other suggestions, and I think it would be best to put value higher than first condition rather than any variable, and will let you know.  
  
And for the else statement in first condition, due to variation of the temperature, I have left another if intentionally, so basically motors will open sides when temperature (with this temp values) is higher than 25 C, and will close if temp is less than 22 (and not 25). Real values would be 18C + 7C = 25C to open, and 18 to close.   
  
Again, I really appreciate your assistance, as I always think it is good first to learn from your and others mistakes but sometimes (like in this case), I am missing obvious logic :-)  
  
Thank you very much and I will post results.

[**amerko**](http://forum.arduino.cc/index.php?action=profile;u=50891)

* Newbie
* Posts: 11
* Karma: 0  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=50891;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902734#msg1902734)

**#9**

[**Sep 30, 2014, 10:22 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1902734#msg1902734)

Sorry, but here is another maybe another stupid question. How do I declare previous state  
  
  if ((currentTempDallas1 > setpointD + thresholdD) && (previousTempDallas1 <= setpointD + thresholdD) || (h > 52))  
  
as I have received error:  
  
'previousTempDallas1' was not declared in this scope

[**dlloyd**](http://forum.arduino.cc/index.php?action=profile;u=204741)

* Faraday Member
* Posts: 3,357
* Karma: 583  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=204741;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1902931#msg1902931)

**#10**

[**Oct 01, 2014, 02:04 am**](http://forum.arduino.cc/index.php?topic=269938.msg1902931#msg1902931)

You could try a layout like this:

Code: [[Select]](javascript:void(0);)

// declare variables  
float currentTempDallas1;  
float previousTempDallas1;  
float h;  
float hPrevoious;  
float t;  
float tPrevoious;  
  
void setup() {  
  // your setup code  
}  
  
void loop() {  
  //take current readings  
  sensors.requestTemperatures();  
  currentTempDallas1 = sensors.getTempCByIndex(0);  
  h = dht.readHumidity();  
  t = dht.readTemperature();  
  
  // your code (conditions for triggering, etc.)  
  
  //update previous readings  
  previousTempDallas1 = currentTempDallas1;  
  hPrevoious = h;  
  tPrevoious = t;  
}  
  
For your conditions for triggering, I would get the conditions for temperature and humidity working separately first, in separate sections of code, as you currently have failed logic when combining them as noted by robtillaart in reply#7.

[**amerko**](http://forum.arduino.cc/index.php?action=profile;u=50891)

* Newbie
* Posts: 11
* Karma: 0  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=50891;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1903917#msg1903917)

**#11**

[**Oct 01, 2014, 05:37 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1903917#msg1903917)

Many thanks for your help. Please note that yesterday, after I've changed values to "reasonable and logic" one for testing purpose, it worked great. If conditions set earlier, would not have problem if they were used in real system with real values, but for testing I've overlapped to conditions, as Rob's sharp eye noticed :-), and again I feel dumb :-)  
  
But, both of answers contributed to better understanding and improvement of the system, and I would try to incorporate your suggestions, as you've both said it should work better. Robs useful comment on when to make some action is great.  
  
I will keep you posted and many thanks again.

[**amerko**](http://forum.arduino.cc/index.php?action=profile;u=50891)

* Newbie
* Posts: 11
* Karma: 0  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=50891;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1906799#msg1906799)

**#12**

[**Oct 03, 2014, 06:26 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1906799#msg1906799)

Hi,  
  
following the suggestions, I have modified my code to include all scenarios, but now I am having situation when one of temp, even satisfies the condition to write HIGH to Relay 2, it doesn't. If changing temp individually, both Dallas and DHT sensor triggers the relay 2. I have tried to check the conditions in the code but doesn't see the problem.  
  
Please see below output from serial monitor:  
  
As you can see from this example, Temperature Dallas1 goes down from 26.50 to 25.12, it turns fan OFF, even DHT Temp is 26.50   
  
   Temperature Dallas1:    **26.50**  
DHT Humidity: 94.60 %   DHT Temperature: **26.50**\*C  
   **Fan OFF**    
   Temperature Dallas1:    **25.12**  
DHT Humidity: 88.90 %   DHT Temperature: 26.50 \*C  
  
In second test, if DHT Temperature decrease from 26.00 to 25.90, it turns fan OFF, which it should do, but in this case Dallas temp is lower than set value:  
   Temperature Dallas1:    23.19  
DHT Humidity: 47.20 %   DHT Temperature: 26.00 \*C  
   Fan OFF     
   Temperature Dallas1:    23.19  
DHT Humidity: 46.50 %   DHT Temperature: 25.90 \*C  
  
Also, same situation happens if humidity goes down below conditional value, and it turns Relay 2 OFF, independently of Temp condition.  
I'd checked the code and the values are set properly, and I can not found the reason for this behavior.    
Could you please take a look and see if I am missing something.  
  
Originally, I have used || "or" statement, but as proposed by Rob, I have separated the conditions (although I think he proposed it in situation of one temp sensor and humidity, but with two temp sensors it complicates situation). Do you think it would be better if I include "or" statements to same condition for writing to output pin?  
  
Your assistance would be highly appreciated.  
  
Many thanks in advance and please see code below:

Code: [[Select]](javascript:void(0);)

#include <OneWire.h>  
#include "DHT.h"  
#include <DallasTemperature.h>  
  
OneWire oneWire(18);  
  
#define DHTPIN 21   
#define DHTTYPE DHT22  
  
#define RELAY\_ON 0  
#define RELAY\_OFF 1  
  
#define Relay\_1  14  // Arduino Digital Output pins for relay 1 - DPDT relay for motor control  
#define Relay\_2  15  // Arduino Digital Output pins for relay 2 - Fan  
#define Relay\_3  16  // Arduino Digital Output pins for relay 3 - Sprinkler  
#define Relay\_4  17  // Arduino Digital Output pins for relay 4 - Pump  
  
int setpointD = 22; // Reference Temperature for sensor Dallas DS18B20   
int thresholdD = 3; // Temperature difference for sensor Dallas DS18B20   
int setpointDHT = 22; // Reference Temperature for sensor DHT22  
int thresholdDHT = 3; // Temperature difference for sensor  Dallas DHT22  
  
// declare variables  
float currentTempDallas1;  
float previousTempDallas1;  
float h;  
float hPrevious;  
float t;  
float tPrevious;  
  
DallasTemperature sensors(&oneWire);  
DHT dht(DHTPIN, DHTTYPE);  
  
void setup()  
{  
  sensors.begin();  
  Serial.begin(9600);  
  
  //-------( Initialize Pins so relays are inactive at reset)----  
  digitalWrite(Relay\_1, RELAY\_OFF);  
  digitalWrite(Relay\_2, RELAY\_OFF);  
  digitalWrite(Relay\_3, RELAY\_OFF);  
  digitalWrite(Relay\_4, RELAY\_OFF);    
  
  //---( THEN set pins as outputs )----    
  pinMode(Relay\_1, OUTPUT);     
  pinMode(Relay\_2, OUTPUT);    
  pinMode(Relay\_3, OUTPUT);    
  pinMode(Relay\_4, OUTPUT);      
  delay(4000); //Check that all relays are inactive at Reset  
  
  dht.begin();  
  
}  
void loop()  
  
{  
  sensors.requestTemperatures();  
  currentTempDallas1 = sensors.getTempCByIndex(0);  
  h = dht.readHumidity();  
  t = dht.readTemperature();  
  
  // Condition for triggering motor for opening sidewall curtains using relay 1,   
  // which should be initiated Dallas temp sensor is higher than set value  
  if (((currentTempDallas1 > (setpointD + thresholdD)) && (previousTempDallas1 <= (setpointD + thresholdD))))  
  {  
    digitalWrite(Relay\_1, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Sidewall curtains up");  
    Serial.print("\t");  
  }  
  // Condition for triggering motor for closing sidewall curtains using relay 1,   
  // which should be initiated Dallas temp sensor is lower than set value  
  if ((currentTempDallas1 < setpointD) && (previousTempDallas1 >= setpointD))   
  {  
    digitalWrite(Relay\_1, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Sidewall curtains down");  
    Serial.print("\t");  
  }  
  
  // Condition for triggering motor for opening sidewall curtains using relay 1,   
  // which should be initiated DHT22 temp sensor is higher than set value  
  if ((t > (setpointDHT + thresholdDHT)) && (tPrevious <= (setpointDHT + thresholdDHT)))  
  {  
    digitalWrite(Relay\_1, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Sidewall curtains up");  
    Serial.print("\t");  
  }  
  // Condition for triggering motor for closing sidewall curtains using relay 1,   
  // which should be initiated DHT temp sensor is lower than set value  
  if ((t < setpointDHT) && (tPrevious >= setpointDHT))  
  {  
    digitalWrite(Relay\_1, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Sidewall curtains down");  
    Serial.print("\t");  
  }  
    
  // Condition for turning ON the fan using relay 2,   
  // which should be initiated if Dallas temp sensor is higher than set value  
  if ((currentTempDallas1 > 26) && (previousTempDallas1 <= 26))  
  {  
    digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Fan ON");  
    Serial.print("\t");  
  }  
  // Condition for turning OFF the fan using relay 2,   
  // which should be initiated if Dallas temp sensor is lower than set value   
  if ((currentTempDallas1 < 26) && (previousTempDallas1 >= 26))  
  {  
    digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Fan OFF");  
    Serial.print("\t");  
  }  
  
  // Condition for turning ON the fan using relay 2,   
  // which should be initiated if DHT temp sensor is higher than set value  
  if ((t > 26) && (tPrevious <= 26))  
  {  
    digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Fan ON");  
    Serial.print("\t");  
  }  
  // Condition for turning OFF the fan using relay 2,   
  // which should be initiated if DHT temp sensor is lower than set value   
  if ((t < 26) && (tPrevious >= 26))    
  {  
    digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Fan OFF");  
    Serial.print("\t");  
  }  
  
  // Condition for turning ON the fan using relay 2,   
  // which should be initiated if DHT humidity sensor is higher than set value  
   if ((h > 60) && (hPrevious <= 60))  
  {  
    digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Fan ON");  
    Serial.print("\t");  
  }   
  // Condition for turning OFF the fan using relay 2,   
  // which should be initiated if DHT humidity sensor is lower than set value    
   if ((h < 60) && (hPrevious >= 60))    
  {  
    digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Fan OFF");  
    Serial.print("\t");  
  }  
    
  // Condition for triggering the sprinkler using relay 3,   
  // which should be initiated if humidity is higher than set value  
  if ((h > 80) && (hPrevious <= 80))  
  {  
    digitalWrite(Relay\_3, RELAY\_ON);// set the Relay ON  
    Serial.print("\t");  
    Serial.print("Sprinkler ON");  
    Serial.print("\t");  
  }  
  if ((h < 80) && (hPrevious >= 80))  
  {  
    digitalWrite(Relay\_3, RELAY\_OFF);// set the Relay OFF  
    Serial.print("\t");  
    Serial.print("Sprinkler OFF");  
    Serial.print("\t");  
  }  
  Serial.println();  
  
  Serial.print("\t");  
  Serial.print("Temperature Dallas1: ");  
  Serial.print(currentTempDallas1,2);  
  Serial.println(" \*C\t");  
    
  //update previous readings  
  previousTempDallas1 = currentTempDallas1;  
  hPrevious = h;  
  tPrevious = t;  
  
  if (isnan(t) || isnan(h)) {  
    Serial.println("Failed to read from DHT");  
  }   
  else {  
    Serial.print(" DHT Humidity: ");   
    Serial.print(h);  
    Serial.print(" %\t");  
    Serial.print("DHT Temperature: ");   
    Serial.print(t);  
    Serial.println(" \*C");  
  }  
  delay(1000);  
}

[**robtillaart**](http://forum.arduino.cc/index.php?action=profile;u=22951)

* **Global Moderator**
* Brattain Member
* Posts: 18,285
* Karma: 1029  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=22951;ab2c6e6=8004d12ce998863981e062c4dd60f699)
* In theory there is no difference between theory and practice, however in practice there are many...

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1906825#msg1906825)

**#13**

[**Oct 03, 2014, 06:53 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1906825#msg1906825)

why do you use 2 temp sensors?  
do they have a separate purpose?

Rob Tillaart  
  
Nederlandse sectie - http://arduino.cc/forum/index.php/board,77.0.html -  
(Please do not PM for private consultancy)

[**amerko**](http://forum.arduino.cc/index.php?action=profile;u=50891)

* Newbie
* Posts: 11
* Karma: 0  [[add]](http://forum.arduino.cc/index.php?action=karma;sa=applaud;uid=50891;ab2c6e6=8004d12ce998863981e062c4dd60f699)

[**Re: Help needed with multiple conditions in Greenhouse project**](http://forum.arduino.cc/index.php?topic=269938.msg1906835#msg1906835)

**#14**

[**Oct 03, 2014, 07:01 pm**](http://forum.arduino.cc/index.php?topic=269938.msg1906835#msg1906835)

Hi Rob,  
  
they would be set at different positions in the greenhouse, but I was even thinking to live without it :-) , and to simply use only Dallas for temp (as I think it might be better).   
  
Putting values on paper, I have just noticed that the problem is with previous values:  
  
 if ((currentTempDallas1 > 26) && (previousTempDallas1 <= 26))  
 {  
   digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
  
 if ((currentTempDallas1 < 26) && (previousTempDallas1 >= 26))  
 {  
   digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
  
If currentTempDallas1 = 25.12 and previousTempDallas1 = 26.5, it turns OFF,   
  
but for other DHT temp sensor:  
  
 if ((t > 26) && (tPrevious <= 26))  
 {  
   digitalWrite(Relay\_2, RELAY\_ON);// set the Relay ON  
 if ((t < 26) && (tPrevious >= 26))    
 {  
   digitalWrite(Relay\_2, RELAY\_OFF);// set the Relay OFF  
  
since t=26.50 and tPrevious=26.50, and tPrevious doesn't meet the condition, no change have been detected, and it doesn't digitalWrite HIGH!   
So, I will have to look for another solution, and if someone has solution for this, please suggest :-)

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