

```
int adcCount;
int shtClk=8;
int shtData=10;
int ioByte;
int ackBit;
double retVal; // Return value from SHT11
int dly;
int dataByte1, dataByte2, pin, valor,i;
int tC; //temperatura en C
int rhLin; // Humedad relativa
int rhTrue; //humedad con C
int TEMPERATURE=0;
int HUMIDITY=0;
uint8_t bitmask;

void SHT_Write_Byte(void) {
    pinMode(shtData, OUTPUT);
    shiftOut(shtData, shtClk, MSBFIRST, ioByte);
    pinMode(shtData, INPUT);
    digitalWrite(shtData, LOW);
    digitalWrite(shtClk, LOW);
    digitalWrite(shtClk, HIGH);
    ackBit = digitalRead(shtData);
    digitalWrite(shtClk, LOW);
}

int shiftIn() {
    int cwt;
    cwt=0;
    bitmask=128;
    while (bitmask >= 1) {
        digitalWrite(shtClk, HIGH);
        cwt = cwt + bitmask * digitalRead(shtData);
        digitalWrite(shtClk, LOW);
        bitmask=bitmask/2;
    }
    return(cwt);
}

void SHT_Read_Byte(void) {
    ioByte = shiftIn();
    digitalWrite(shtData, ackBit);
    pinMode(shtData, OUTPUT);
    digitalWrite(shtClk, HIGH);
    digitalWrite(shtClk, LOW);
    pinMode(shtData, INPUT);
    digitalWrite(shtData, LOW);
}

void SHT_Connection_Reset(void) {
    shiftOut(shtData, shtClk, LSBFIRST, 255);
    shiftOut(shtData, shtClk, LSBFIRST, 255);
}
```

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}

void SHT_Soft_Reset(void) {
    SHT_Connection_Reset();
    ioByte = 30;
    ackBit = 1;
    SHT_Write_Byte();
    delay(15);
}

void SHT_Wait(void) {
    delay(5);
    dly = 0;
    while (dly < 600) {
        if (digitalRead(shtData) == 0) dly=2600;
        delay(1);
        dly=dly+1;
    }
}

void SHT_Start(void) {
    digitalWrite(shtData, HIGH);
    pinMode(shtData, OUTPUT);
    digitalWrite(shtClk, HIGH);
    digitalWrite(shtData, LOW);
    digitalWrite(shtClk, LOW);
    digitalWrite(shtClk, HIGH);
    digitalWrite(shtData, HIGH);
    digitalWrite(shtClk, LOW);
}

void SHT_Measure(int vSvc) {
    SHT_Soft_Reset();
    SHT_Start();
    ioByte = vSvc;
    SHT_Write_Byte();
    SHT_Wait();
    ackBit = 0;
    SHT_Read_Byte();
    int msby;
    msby = ioByte;
    ackBit = 1;
    SHT_Read_Byte();
    retVal = msby;
    retVal = retVal * 0x100;
    retVal = retVal + ioByte;
    if (retVal <= 0) retVal = 1;
}

int SHT_Get_Status(void) {
    SHT_Soft_Reset();
    SHT_Start();
```

```
ioByte = 7;
SHT_Write_Byte();
SHT_Wait();
ackBit = 1;
SHT_Read_Byte();
return(ioByte);
}

void SHT_Heater(void) {
  SHT_Soft_Reset();
  SHT_Start();
  ioByte = 6;
  SHT_Write_Byte();
  ioByte = 4;
  SHT_Write_Byte();
  ackBit = 1;
  SHT_Read_Byte();
  delay(500);
  SHT_Soft_Reset();
  SHT_Start();
  ioByte = 6;
  SHT_Write_Byte();
  ioByte = 0;
  SHT_Write_Byte();
  ackBit = 1;
  SHT_Read_Byte();
}

//Write Temp or Humidity via serial 1->tem 2->humidity
void SHT_write(unsigned int temporal ){
  if (temporal==1){
    // SHT11 #1 Temperature
    SHT_Measure(3);

    Serial.println(retVal,DEC);

  }
  if (temporal==2){

    // SHT11 #1 Humidity
    SHT_Measure(5);
    Serial.println(retVal, DEC);

  }
}

void setup()
{
  for (i=1;i<14;i++){
    pinMode(i,OUTPUT);
  }
}
```

```
//Recordar que el 10 y el 8 están reservados para SHT11

Serial.begin(9600); // open serial
SHT_Connection_Reset();
//test de inicio
digitalWrite(13, HIGH);
delay(2000);
digitalWrite(13, LOW);

}

void loop(){

// Comprobamos si existe algún cambio en la temperatura o humedad
//miramos la temperatura con SHT_Measure(3) y la humedad con 5
SHT_Measure(3);
retVal = retVal*0.01 - 40;
tC = retVal;

if (tC != TEMPERATURE)
{
    TEMPERATURE=tC;
    Serial.print("TEMPERATURE ");
    Serial.println(TEMPERATURE);
    delay(5000);
}

SHT_Measure(5);
rhLin = (retVal * 0.0405) - (retVal * retVal * 0.0000028) - 4;
rhTrue = (tC - 25) * (retVal * 0.00008 + 0.01) + rhLin;
// En ocasiones retorna valores inválidos, por eso comprobamos que sea mayor que 0
if (rhTrue != HUMIDITY and rhTrue > 0)
{
    HUMIDITY=rhTrue;
    Serial.print("HUMIDITY ");
    Serial.println(HUMIDITY);

//controlamos el relé del pin 3 para abrir o cerrar la bomba
if (HUMIDITY< 96) digitalWrite(3,HIGH);
if (HUMIDITY > 97) digitalWrite(3,LOW);
    delay(5000);
}
delay(5000);

}
```