AN-017 Rev 1.0

Z2M Part Number:
EDS-00004-A

Analog Temperature Sensor
(Technical Note)

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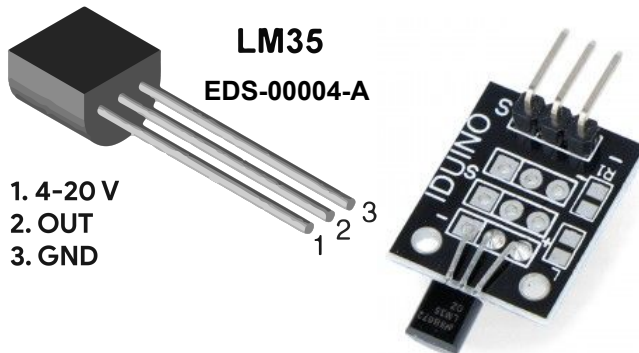
What is LM-35 Temperature Sensor?

LM35
EDS-00004-A

1. 4-20 V
2. OUT
3. GND

The LM35 series of devices are precision integrated-circuit temperature devices with an analog output voltage, which is linearly proportional to the Centigrade temperature. LM35 is a three terminal linear temperature sensor which can measure temperature from -55 to +150 degree Celsius.

Scientific Fact and Applications

This sensor is calibrated directly in Celsius (Centigrade). The voltage output of the LM35 increases at a rate of 10 mV per degree Celsius rise in temperature. It does not require any external calibration, as it maintains an accuracy of +/-0.4°C at room temperature and +/-0.8°C over a range of 0°C to +100°C.

Applications

Televisions
Such sensors provide a safety protection and diagnostics capabilities in the event of components overheating, either from the electronics or the display. Along with this, these are used for correcting temperature drift on LED or OLED to enhance display performance and quality

Electric Motors
These sensors are used in electric motors for measuring the motor winding temperature, internal housing temperature, bearing temperature, brushes temperate, and external body temperature.

Temperature Autocuts
The machines incorporate temperature sensors to have cooling/heating autocuts.
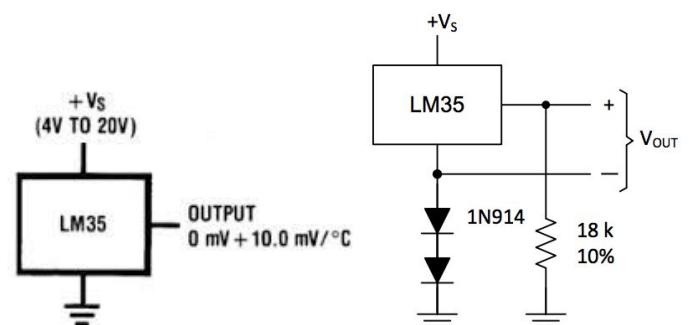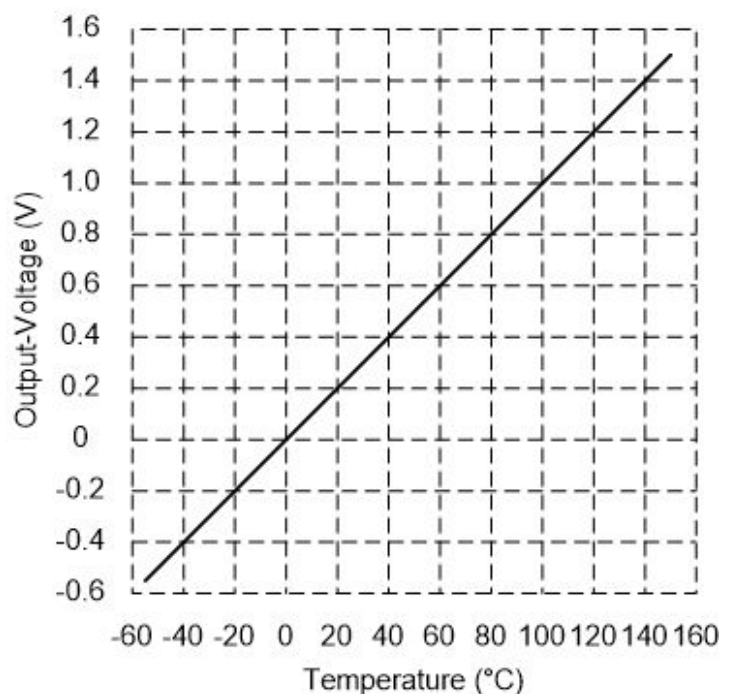
Basic Centigrade Temperature Sensor (+2C to +150C)

Single Supply Extended Centigrade Temperature Sensor (-55C to +150C)

Analog Temperature Sensor
(Application Note)

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Project

To sense environmental temperature by using KY001/ LM35 connected to Arduino
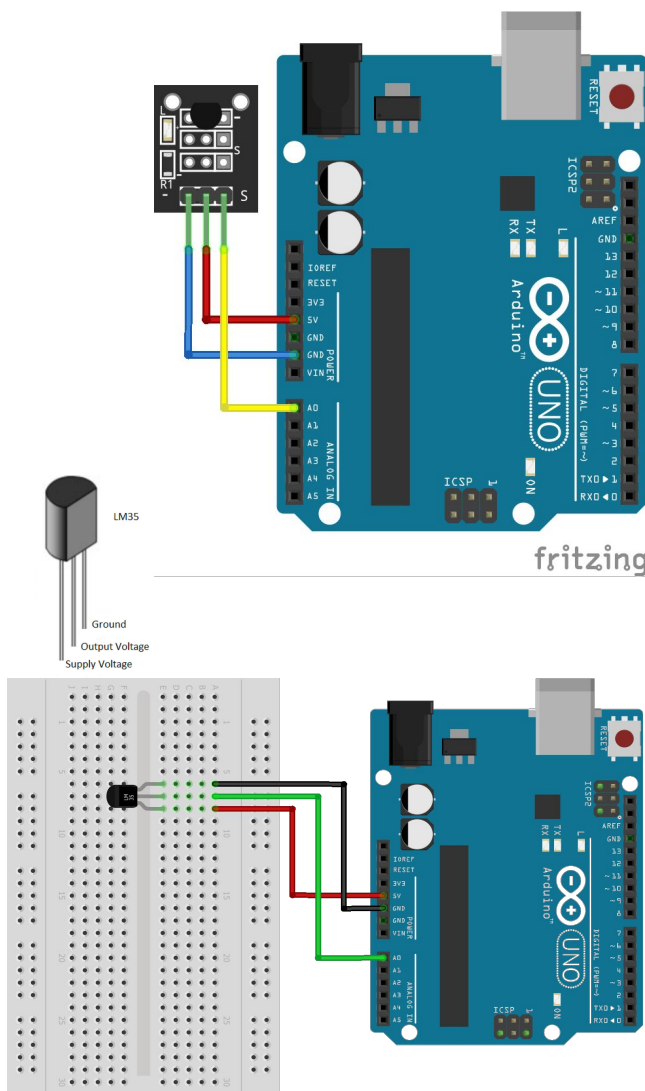
Procedure

KY-001 Module
- Connect **Middle** pin of sensor to **5V** of Arduino
- Connect **Minus** pin of sensor to **GND** of Arduino
- Connect pin **S** of sensor to pin **A0** of Arduino

LM35 Sensor Device
- Connect **Vcc** pin of sensor to **5V** of Arduino
- Wire **GND** pin of the sensor to **GND** of the Arduino
- Connect **2nd(Middle)** pin to **A0** of Arduino

Schematic

LM35
Ground
Output Voltage
Supply Voltage

Components Required

Component	Part No.	Qty
Arduino UNO	EMX-00001-A	1
LM35 Temp Sensor	EMS-00004-A	1

Code

```c
int tempsensor = A0;
/*Connecting the sensor to A0 pin of
Arduino*/

void setup() {
  pinMode(tempsensor, INPUT);/* Setting
the Temperature Sensor pin as INPUT*/
  Serial.begin(9600);
}

void loop() {
  float val = analogRead(tempsensor);
/* Storing the read value in "val"
variable*/
  float celc = (val*500)/1024;
/* Calculating the read input for
degree Celsius*/

  Serial.println("");
  Serial.print("deg Celcius = ");
/* Printing "deg Celcius = " on serial
monitor*/
  Serial.println(celc);
/* Printing the calculated Celcius
value on serial monitor*/
  Serial.println("");
  delay(1000);
/* Giving delay of 1000ms that is 1
second*/
}
```

Challenge Yourself

1. Make the temperature alert system
2. Design an automated switch system for turning a fan on and off dependent on temperature