



TINKERKIT THERMOMETER

Measures the temperature.

Range: -50°C to 50°C

Ease of use: simple

Use: measuring the temperature

Necessary hardware: a Tinkerkit shield, and a Tinkerkit cable

This sensor uses a resistance whose value varies with the temperature (thermistor) to determine the temperature of the sensor.

Wiring

Install the Tinkerkit library on your computer, and the Tinkerkit shield on your Arduino board. Connect the sensor to the I0 input of the shield. If you do not have a suitable cable, or no Tinkerkit shield, connect your sensor to the A0 input of your Arduino board (see "Tinkerkit shield" sheet).

Coding

Once the Tinkerkit library is installed, open the sample program available from the File menu, Examples, Tinkerkit, Thermistor program.

<Tinkerkit.h>: this library defines the coding instructions necessary to communicate with the sensor.

TKThermistor therm(I0): creates a variable 'therm', of type TKThermistor (defined in the library Tinkerkit), corresponding to a Tinkerkit Thermometer connected to the input I0. The name of the variable can be changed, as can the input port.

therm.read(): this instruction retrieves the value of temperature measured by the sensor associated with the therm variable. It is an integer value between 0 and 1023.

therm.readCelsius(): this instruction gives the temperature in degrees Celsius.

therm.readFahrenheit(): this instruction gives the temperature in degrees Fahrenheit

TOOL – TINKERKIT THERMOMETER

The following program will have the same behavior as the Tinkerkit library example:

```
const float ADCres = 1023.0 ;
const int Beta = 3950 ;
const float Kelvin = 273.15 ; // 0°C = 273.15 K
const int Rb = 10000 ; // 10 kOhm
const float Ginf = 120.6685 ; // Ginf = 1/Rinf
// Rinf = R0*e^(-Beta/T0) = 4700*e^(-3950/298.15)

void setup() {
  Serial.begin(9600) ; // the serial communication between board and computer is initialized
}

void loop() {
  int MeasuredVoltage = analogRead(A0) ; // sensor should be connected to I0, or A0
  Serial.print("Value on the A0 port = ") ;
  Serial.println(MeasuredVoltage) ;
  float Rthermistor = Rb * (ADCres / Voltage - 1) ;
  float TemperatureC = Beta / (log( Rthermistor * Ginf )) - Kelvin ;
  Serial.print("Temperature in degree C = ") ;
  Serial.println(TemperatureC) ;
  float TemperatureF = (TemperatureC * 9.0) / 5.0 + 32.0 ;
  Serial.print("Temperature in degree F = ") ;
  Serial.println(TemperatureF) ;
  delay(1000) ;
}
```

UPLOAD



Open the serial monitor to observe the measurements made by the thermometer. Change the temperature by heating the sensor with your hands.



The calibration of the sensor is not certified: do not use it for critical applications (such as medical applications).



Warning: this sensor is not waterproof, do not use it to measure the temperature of liquid water.

Possible uses of the sensor:

- Tracking the temperature in a home-made weather station.