**用处**

[**https://www.pyrosales.com.au/blog/thermocouple-information/what-are-temperature-sensors-used-for/**](https://www.pyrosales.com.au/blog/thermocouple-information/what-are-temperature-sensors-used-for/)

本质上，这些传感器向系统提供输入，以便近似或准确地确定特定物体或环境的温度。

Obviously, these sensors provide input to a system in order to either approximately or accurately determine the temperature of a particular object or environment.

您可能只是假设温度传感器仅用于找出物体或环境的温度

You may just assume that temperature sensors are simply used to find out the temperature of an object or environment

虽然这是他们旨在测量的事情之一，但许多温度传感器也用于检查过程是否在特定范围内发生。

While this is one of the things they aim to measure, many temperature sensors are also used to check whether a process is taking place within a particular range.

特别是，预防性可靠性是温度传感器的核心应用，它有助于确保系统正常运行，并确定是否存在即将发生的危险或故障风险。

In particular, preventative reliability is a core application for temperature sensors, which help ensure a system is functioning properly, and determine whether there are impending risks of danger or malfunction.

**定义**

<https://www.elprocus.com/types-analog-digital-sensors/>

以数字方式进行数据转换和数据传输的电子传感器或电化学传感器称为数字传感器。

Electronic sensors or electrochemical sensors in which data conversion and data transmission takes place digitally are called as digital sensors.

数字传感器主要由三部分组成：传感器、电缆和发射器。

The digital sensor consists of majorly three components: senor, cable, and transmitter.

在数字传感器中，测量的信号在数字传感器本身内部直接转换为数字信号输出。

In digital temperature sensors, the signal measured is directly converted into digital temperature output inside the digital sensor itself.

而这个数字信号是通过电缆数字传输的。

And this digital signal is transmitted through cable digitally.

这些数字传感器正在取代模拟传感器，因为有不同类型的数字传感器可以克服模拟传感器的缺点。

These digital sensors are replacing analog sensors as there are different types of digital sensors that overcome disadvantages of analog sensors.

**用法** [**https://www.apogeeweb.net/circuitry/ds18b20-working-principle.html**](https://www.apogeeweb.net/circuitry/ds18b20-working-principle.html)**（详细）**

温度传感器工作的基本原理是二极管端子两端的电压。

The basic principle of working of the temperature sensors is the voltage across the diode terminals.

这种类型的传感器由一种会根据温度变化以改变电阻值的材料组成。

This type of sensor consists of a material that operates according to temperature to vary the resistance.

电路感应到电阻的这种变化并计算温度。当温度升高时，电压也会升高。

This change of resistance is sensed by the circuit, and it calculates the temperature. When the voltage increases then the temperature also rises.

We can see this operation by using a diode.

**举例**

[**https://www.apogeeweb.net/circuitry/ds18b20-working-principle.html#3-5-temperature-reading**](https://www.apogeeweb.net/circuitry/ds18b20-working-principle.html#3-5-temperature-reading)

The DS18B20 temperature sensor is a one-wire digital temperature sensor. This means that it just requires one data line (and GND) to communicate with the Arduino.

Each DS18B20 temperature sensor has a unique 64-bit serial code. This allows you to wire multiple sensors to the same data wire. So, you can get temperature from multiple sensors using just one Arduino digital pin.

It can be powered by an external power supply, or it can derive power from the data line (called “parasite mode”), which eliminates the need for an external power supply.

**Demo**

**优势**

[**https://www.te.com/usa-en/industries/sensor-solutions/insights/digital-over-analog.html**](https://www.te.com/usa-en/industries/sensor-solutions/insights/digital-over-analog.html)

传感器精度准确地代表了系统精度，因为不存在由于信号转换造成的进一步损失。

The sensor accuracy represents exactly the system accuracy since no further loss due to signal conversion is applicable.

仅在进行测量时才主要消耗功率。在断电状态下，功耗最小且自发热可忽略不计。

Power is primarily consumed only when measurements are taken. During power down states, there is minimal power consumption and negligible self-heating.

除了具有简单数字接口（如 I2C 或 SPI）的微控制器外，无需额外的外部组件。

No additional external components needed except for a microcontroller with simple digital interfaces like I2C or SPI.

数字温度传感器的价格具有竞争力，并且在过去几年中成本有所下降。

Digital temperature sensors are competitively priced and have declined in cost over the last few years.

**应用**

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温度传感器被用于世界各地许多行业的各种实际用途

Based on these advantages,

Temperature sensors are employed for variety of purposes across many industries throughout the world.

In fact, they’re also used in our own homes and offices, within the transport we travel in, and even in devices, we use every day.

In conclude,

Digital temperature sensor is widely used, and its output is a digital signal.

It has the characteristics of small size, low hardware overhead, strong anti-interference ability and high precision. And it is easy to wire and can be used on many occasions after being packaged.