

IDENTIFICATION

Weekday	Date	Hour	Group	Students
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INTRODUCTION

A smart sensor is an integrated circuit, without external components, that includes a sensing element, an interface with the outside world, signal processing and some “intelligence” including self-test, self-identification and self-validation. It is basically an embedded system that contains sensors, analog-to-digital converters, memory, wired or wireless interface and a microprocessor with its software.

This class is intended to serve as an introduction to the use of smart sensors with a temperature smart sensor from Maxim, model DS18B20.

The temperature is made to change with the help of a Peltier module which is powered by a DC voltage. One of the sides of the module gets hotter and the other one gets colder. If the DC voltage applied is too high the Peltier effect will be less important than two other effects which are also present: heating due to the Joule effect and heating of the cold side due to thermal conduction.

Recommended reading: Book Sensors and Actuators by Francisco Alegria, section 7.5.

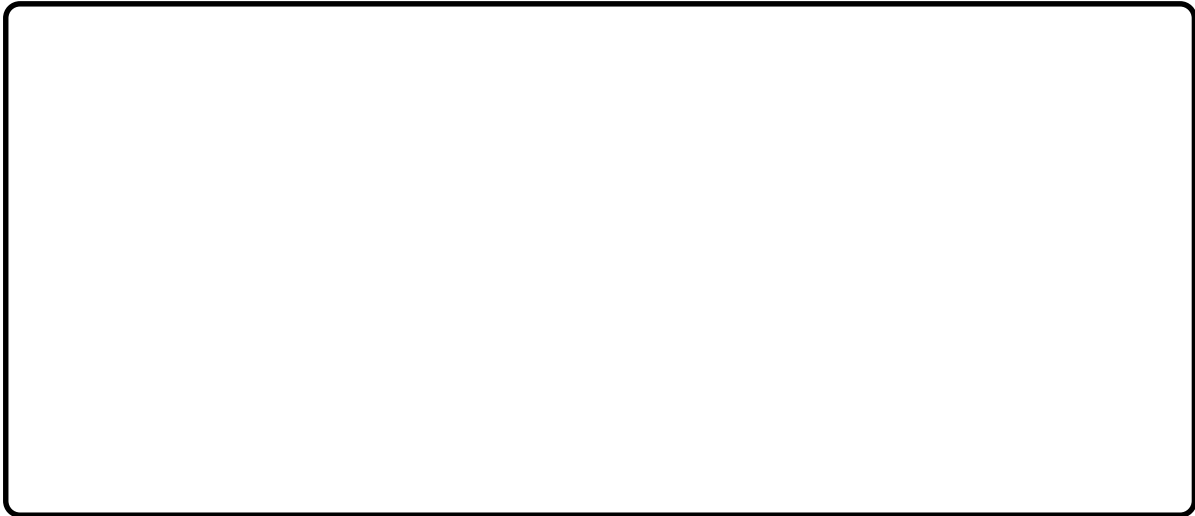
EXECUTION

1) Circuit Assembly

Assemble the temperature sensor and connect it to the Arduino microcontroller. Draw the connection made.

2) *Communication with the sensor*

Create software that reads the temperature from the sensors using the Arduino microcontroller and shows it in the computer screen. Present the flowchart of the application created.



3) *Final Remarks*

Comment on the operation of the system including the accuracy, response time of the measurement and additional features implemented.



MATERIAL

- 2 temperature sensors from Maxim, model DS18B20.
- 1 Peltier module
- Personal computer with Arduino software.
- Breadboard and wires.