

Generic Mote Documentation

William Watts
Mechanical Engineering
UC Berkeley
wawatts@berkeley.edu

Hardware Functionality:

The generic mote board has four mono audio jacks that provide power to a sensor (or actuator), and connection straight to an ADC. Adding a resistor allows for a voltage divider set up that connects to the ADC port. Two of the ADC ports can be changed to digital input/output.

The device is not plug and play. The power and signal pins have to be set according to the specific sensor or actuator that is connected to the input jacks. Important Note: The reference voltage for the ADC input must be set to 2.5 V for proper measurement of battery voltage and temperature in this revision. Please find the InternalVoltage.h file in the Code section. Place that file in your TinyOS tree under –
tinyos-1.x/tos/platforms/msp430/

Signal Input Pins:

The ADC input pins for the generic sensor board are ADC1, ADC2, ADC3, and ADC7. Pins ADC2 and ADC3 can be made into GIO (i.e. exclusive digital input/output) ports by connecting a 0 ohm resistor across R16 and R14 respectively. The tmote-sky-datasheet has more in depth hardware documentation.

For each of the input signal pins, there is a voltage divider capability that can be used, if a sensor requires that circuitry. In that case refer to the eagle layout figure 1, in order to find out how to connect a resistor across the signal input and ground. Resistors R1-R4 can be customized to fit a particular sensor's resolution requirements.

The sensor board design is flexible, because you can set the power pins to be input pins, see below for more explanation.

Power Pins:

ADC0, ADC6, GIO3, GIO2 are the power pins when the voltage divider circuitry is used. The power pins supply a voltage equivalent to the telos mote's battery voltage.

The code in the drapps folder demonstrates how to set pins to power and how to turn them off for power savings.

Alternative Pin Set up:

There are cases when not using the voltage divider set up that one might want to have more flexible usage of the pins. For instance, one might want to set the power pins to input and the former input signal pins to ground.

The appropriate ADC files for changing the pin set up are included in the documentation. Also see the documentation for the set up of the motion sensor on the generic board for an example.

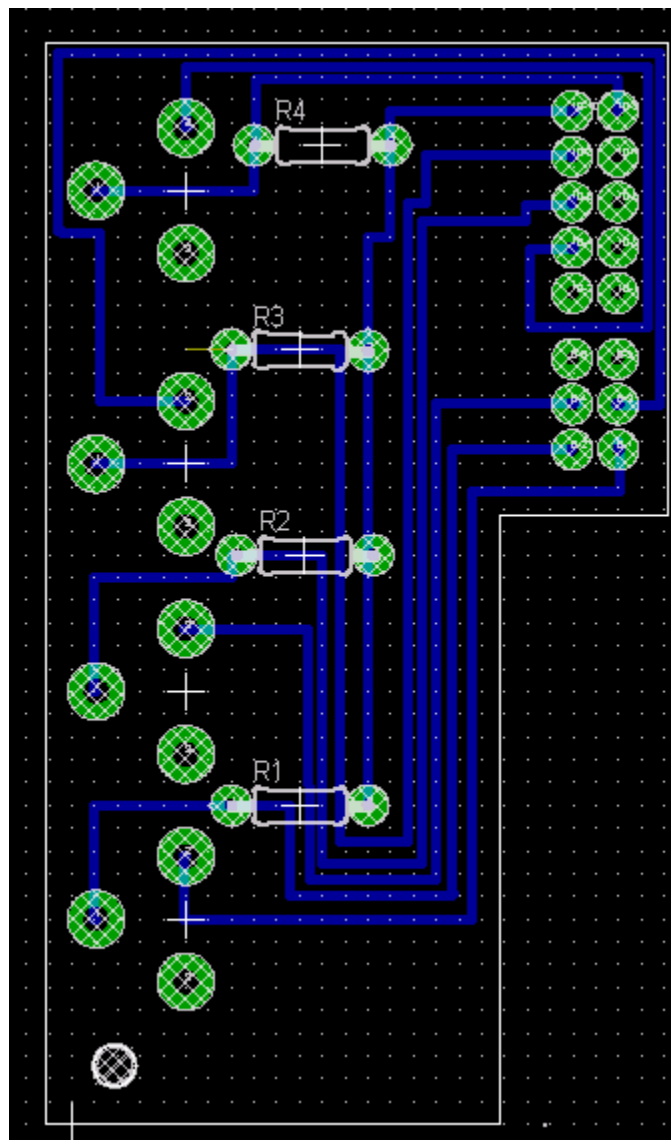


Figure 1: Layout R1-R4 are the resistors for the voltage divider