2-6-BasicADC

Welcome back to Cypress Academy, PSoC 6 101.

But before we do that, let’s start with a project to understand the basics behind what components are needed to interface to the thermistor. The PSoC 6 architecture is rich with analog peripherals, so in this lesson, I will be covering the basics of the ADC and OpAmp components that will interface with thermistor. .As a reminder, the thermistor is on the E-ink display shield board, so don’t forget to plug that into the remote controller board using the Arduino Uno headers provided for you on the kit.

So let’s get started! Lets create a new project, I’ll call that Basic Thermistor.

Drop the uart

Look at the shield schematic.

Drop the adc

Drop 4 analog pins…

Explain annotation components

Drop the external element 10K resistor and turn off the instance name

Drop the external element thermistor… set to 10K and take off the instance name

Thermistor measurement are ratiomatic… the absolute value of the voltages don’t make a difference. In order to make this work you need to “power” the stack of resistors… how do you do that? Well let me show you

Edit the first pin and change the name to A0, turn on the external connection, turn on the digital output and set to high… what this does is makes it so that this pin is both a digital output … so I can drive a one or a 3.3.v onto it… but at the same time it is also an analog input which can be routed to the differential input on the sar.

Edit the last ping and change the name to A3, turn on the external connection and turn on the digital out and set to low

Edit the next pin and turn it to A1 and turn on the external connection

Exit the next pin and turn it to A2 and turn on the external connection

Wire it up

Assign the pin.

Add in

Generate application

What happens if you have a noisy power supply? Well this whole thing depends on your measurement of the reference resistor and the thermistor being taken with exactly the same input voltage.

Copy the the project and then paste it.

Rename it to 2—6-ADC\_OPAMP\_VREF

Change A0 back to just an analog pin. Fix the external component wire

Add the vref signal to project

Add an opamp to the project

Make it a follower… also known as an analog buffer and change it to output to pin.

Wire it to A0

Change the adc vref setting to be the system bandgap

Edit the firmware to start the op\_amp

Program it.

You can post your comments and questions in our PSoC 6 community or as always you are welcome to email me at alan\_hawse@cypress.com or tweet me at @askioexpert with your comments, suggestions, criticisms and questions.