AFE Sensor Hub (4-4)

Welcome back to Cypress Academy, PSoC 6 101. In this video we’re finishing up a small tangent I’ve taken us on to look at the analog capabilities of our PSoC MCUs and focus on something near-and-dear to anyone who’s working on an IoT project of some sort…interfacing to sensor hubs over I2C. Again, we’re still using the xxx AFE board we looked at in the previous videos.

On this board we have a dedicated PSoC 4 device specifically designed and preprogrammed by us to provide sensor hub functionality—a single device that interfaces to various sensors and, in this case, also an OLED display to collect sensor data. A PSoC 4 is an Arm Cortex-M0 or M0+ MCU and what’s special about this one is that it’s one of the most analog-rich Cortex-M0s in the market today. As I previously stated, it’s already preprogrammed with a sensor hub application so all we really need to do is interface to it over I2C and grab the data.

[What we’re going to play with and see]

Let’s start a new project this time, I’ll call it “AFE Senor Hub”.

[Setup PSoC Creator schematic]

Double click on the pins file under the design wide resources and assign the signals for the I2C interface and the LEDs as xxx.

We’re going to use the Cortex-M4 to interface to the sensor hub. To show what’s going on, we’re going to let the potentiometer adjust the brightness of the red LED and the ambient light sensor control the brightness of the green LED. So, there will be a little color mixing going on with the RGB LED but you’ll get the jist of what’s going on. So, in the M4 main application file let’s start by xxx. [Firmware design]

And that’s it, now time to build, program and test it.

If everything is working, then you should see the values on the OLED display and the red and green LEDs should change intensity as you change the potentiometer as well as the ambient light over that sensor. Pretty cool right?

In the next video, we’ll pick back up on our regularly scheduled program and start looking at some advanced robotic arm control with WiFi, security and other cool capabilities that when all is said and done, will result in the baddest ass, terminator-like BLE remote controlled robotic arm!

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.