# How to set up the Cypress driver to work with Sensors

1. Using PSOC Creator 3.3, open the provided workspace “NodusC”
2. There are two files used to configure the hardware and API Generation through Cypress
   1. TopDesign.cysch
      1. At the bottom of the “TopDesign” window there is a group of tabs with names like “Communication” and “Digital”
      2. Click on the tab named “My Design”
      3. There are a number of pins already defined here, one being the GPIO pin to a Resistor in parallel with the other sensors called PIN\_RESISTOR
      4. Other pins will be called PIN\_SENSOR\_# , where # is the index of the force sensor, starting from 1
      5. The number of sensors can be increased or decreased by copying an existing sensor and pasting it on the same page, it will be renamed to the next sequential index
      6. Other relevant sections of this Document are the ADC tab, which contains the information for the ADC configureation, the Digital tab, which has the configuration for the hardware timer, and Communication tab, configuring UART and Blue Tooth.
   2. nodusC.cydwr
      1. In this window pins can be assigned to specific ports on the microcontroller
      2. The pins can be automatically placed dring the build process, or they can be assigned to a specific port.
3. If adding more pins be aware of specific sections in “main.c”
   1. Line 22: #define NUMBER\_OF\_SENSORS needs to be defined as the number of sensors you are reading from, this should be the same as the number of pins.
   2. In main() in the section marked “// initialize pins” the pins[] array needs to match with the pins in the TopDesign file.
      1. The pin defined at pins[0] controls the resistor, where writing “HIGH\_Z” will effectively disconnect the resistor, and writing “LOW” will ground it.
      2. All sequential pins correspond to the sensors and are controlled the same as pins[0]
      3. A pin struct is defined as an id, and a function pointer, which is directed to the API generated function #PIN\_NAME#\_Write
4. Connect Cypress pioneer kit board to computer through USB
5. Open UART terminal, I prefer the program TeraTerm, free to download
   1. Make sure communication port is correct, on my computer it is COM17, it will likely be different for you
   2. Set Baud rate to 115200
   3. All other settings can be left unchanged
6. Build the project by clicking “Build->Build nodusC”
7. Program the chip by clinking “Debug->Program” from the tool bar
8. After the chip is programmed the terminal should be displaying text
9. Ignore the “Press ‘c’” instruction for the time being, the feature was part of a previous version of this code, and will not be used in the final product, instead raw ADC values will be communicated.
10. Press ‘r’ (make sure it’s lowercase) then enter while the TeraTerm window is active. You should see the characters being echoed on the screen, if you see the characters repeated on the screen, turn off local echo in “Setup->Terminal” and uncheck “Local Echo”
11. You should see ADC measurements on each line, followed by a reading for Temperature, which has been deactivated for the moment, and probably shows garbage data.
12. To deactivate the writing of ADC data to the screen press ‘r’ and enter. This will toggle the task off.