Pioneer Shield Board

Introduction

You will be given a custom shield board that can attach to the Pioneer kit as shown here:
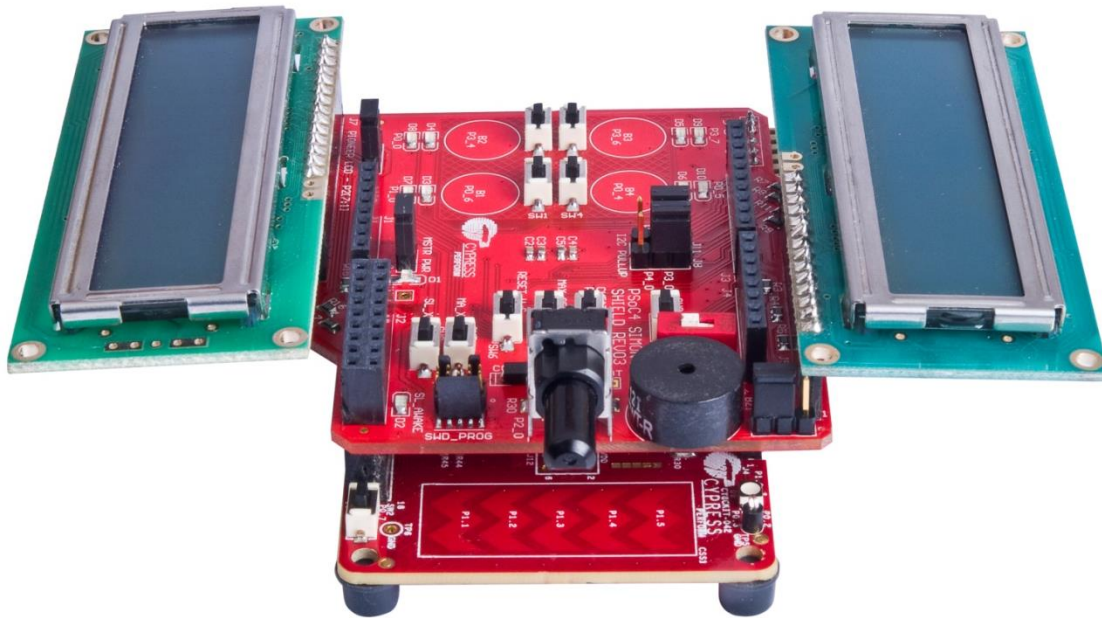

Figure 1: Simon Shield Board

The shield can also be connected to the PSoC 5LP or PSoC 3 kits using an adapter board.

This shield contains the following resources that are accessible from the PSoC 4 on the Pioneer kit:

- Four buttons which can be either mechanical or CapSense
- One mechanical button (labeled "CHEAT")
- Five LEDs
- Potentiometer
- Buzzer with on/off switch
- Character LCD
- Reset switch

There is a separate PSoC 4 on the shield board which can be programmed using the provided 10-pin header. This PSoC 4 can act as an I2C master to communicate to the PSoC 4 on the Pioneer board using either P4_0/P4_1 or P3_0/P3_1 for the I2C clock/data lines. I2C pullup resistors are included on the board. The PSoC 4 on the shield board connects to the following resources:

- Three mechanical buttons (labeled "Start", "MAX SEQ", and "RESET H/S")
- Four LEDs
- Character LCD
- Reset switch

The PSoC 4 on the shield board and its associated resources will be used in the team project so it should be left as-is until that project is completed.

Board Pin Assignments

PSoC 4 Pioneer Pin	Shield Connection	Function
P0[6]	SW1 and CapSense 1	Button 1
P3[4]	SW2 and CapSense 2	Button 2
P3[6]	SW3 and CapSense 3	Button 3
P0[4]	SW4 and CapSense 4	Button 4
P0[7]	SW10	Button "CHEAT"
P1[0]	D7	LED 1 (Red)
P0[0]	D8	LED 2 (Yellow)
P3[7]	D9	LED 3 (Orange)
P0[5]	D10	LED 4 (Green)
P0[1]	D2	LED "AWAKE"
P2[0]	R30	Potentiometer (POT)
P3[5]	BZ1	Buzzer
P3[0]	I2C SCL	I2C Clock
P3[1]	I2C SDA	I2C Data
P2[7:1]	LCD	LCD
P4[2]	None	Capsense CMOD

Board Jumpers

Jumper Name	Function	Settings
J6	Power for Shield PSoC 4 (Master)	Short pins 1 and 2 to provide power to the PSoC 4 that is on the shield board. This device can act as an I2C master.
J12	Power for LCD connected to the Shield PSoC 4 (Master)	Leave unconnected to turn off the LCD Short pins 1 - 2 for a 3.3V LCD Short pins 2 - 3 for a 5V LCD
J13	Power for LCD connected to the Pioneer PSoC 4 (Slave)	Leave unconnected to turn off the LCD Short pins 1 - 2 for a 3.3V LCD Short pins 2 - 3 for a 5V LCD
J8 *	I2C Clock Pin Selection	Leave unconnected to disconnect the Master PSoC 4 I2C line and pullup resistor. Short pins 1 - 2 to connect Pioneer P3_0 to the Master and the I2C pullup resistor. Short pins 2 - 3 to connect Pioneer P4_0 to the Master and the I2C pullup resistor.
J11 *	I2C Data Pin Selection	Leave unconnected to disconnect the Master PSoC 4 I2C line and pullup resistor. Short pins 1 - 2 to connect Pioneer P3_1 to the Master and the I2C pullup resistor. Short pins 2 - 3 to connect Pioneer P4_1 to the Master and the I2C pullup resistor.

* Using P3_0 and P3_1 for the I2C lines allows the Pioneer's built-in I2C-USB bridge to be used to connect to a PC. This allows I2C debugging without requiring a MiniProg3 or a CY3240 bridge.