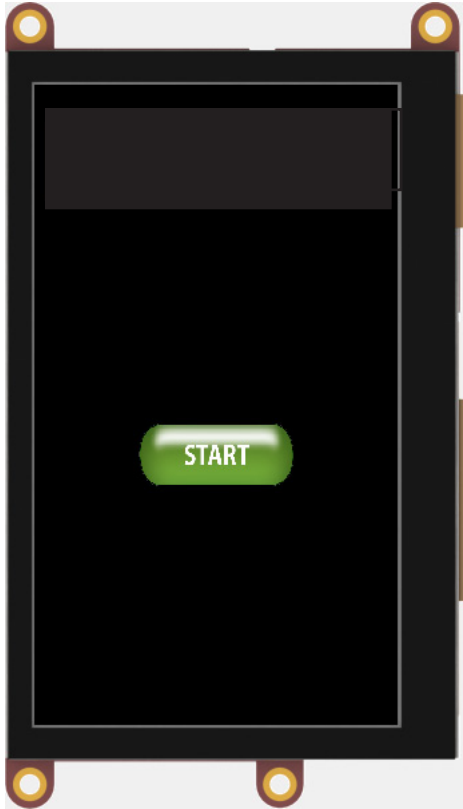
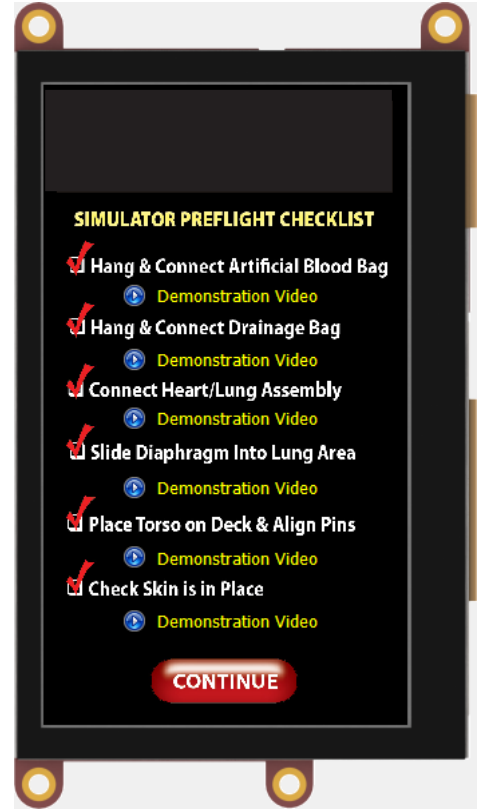


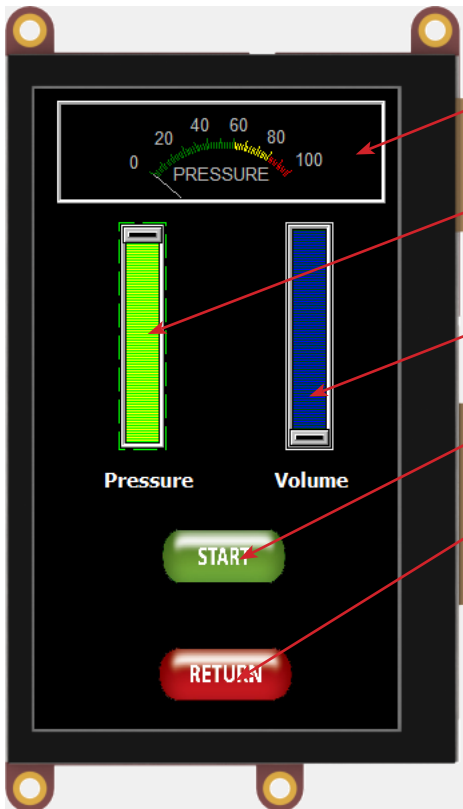
Simulator Software Changes Needed As of 4/28/2016



Initial Screen [Form0]
All functions internal to touchscreen



Preflight Screen [Form1]
All functions internal to touchscreen



Gauges Screen [Form2]

Meter0 - Reads Pressure Gauge connected to Arduino [pin not yet assigned]

Slider1 - Use pulse width modulation to control speed of motor from motor control shield on Arduino (0 to 100%)
Default/start-up setting = 100%

Slider0 - Controls volume to piezo speaker connected to Arduino

Anibutton1 - Starts Arduino sketch

Anibutton2 - Returns screen to Form1

4D Systems

Touchscreen

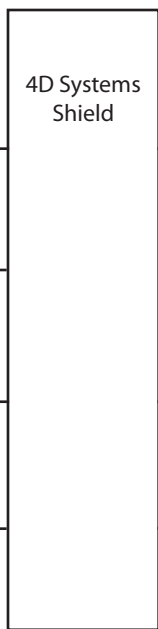
(uLCD-43DCT)

"Meter0"
[Read Pressure]

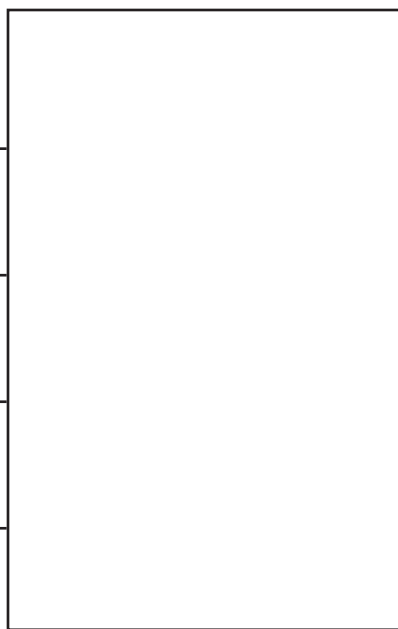
"Slider1"
[Motor speed]

"Slider0"
[Volume]

"Anibutton1"
[Power on Arduino]



Arduino Uno



Simulator

Pressure Sensor

Motor Shield

Hydraulic Pump

Piezo Buzzer

Hydraulic Solenoid

Priming Solenoid

Current Arduino Sketch

```
int ledpin = 2;
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin 13 as an output.
  pinMode(2, OUTPUT);
  pinMode(7, OUTPUT);
  pinMode(12, OUTPUT);
  pinMode(4, OUTPUT);
  digitalWrite(12, HIGH); // open priming vent
  delay(8000); // priming vent open in milliseconds
  digitalWrite(12, LOW); // close priming vent
  delay(1000); // delay before pump starts
  digitalWrite(7, HIGH); // start pump
}
// the loop function runs over and over again
void loop() {
  digitalWrite(2, HIGH); // turn on main solenoid
  digitalWrite(4, HIGH); // turn on buzzer
  delay(300); // keep main solenoid/buzzer on
  digitalWrite(4, LOW); // turn off buzzer
  delay(10); // keep main solenoid open after buzzer stops in milliseconds
  digitalWrite(2, LOW); // turn off main solenoid
  delay(900); // keep main solenoid closed in milliseconds
```

What We Need:

We need to interface the touchscreen to the Arduino via the shield and change the code in the sketch to:

- 1) Add a pressure sensor to the simulator that "Meter0" can read.
- 2) Change the program from constant 100% power to the pump motor to be able to reduce the pressure from the default 100% down to 0 via "Slider1" and the use of a separate motor shield.
- 3) Allow for "Slider0" to control the volume of the piezo buzzer.
- 4) Allow for "Anibutton1" to power up and power down the Arduino.