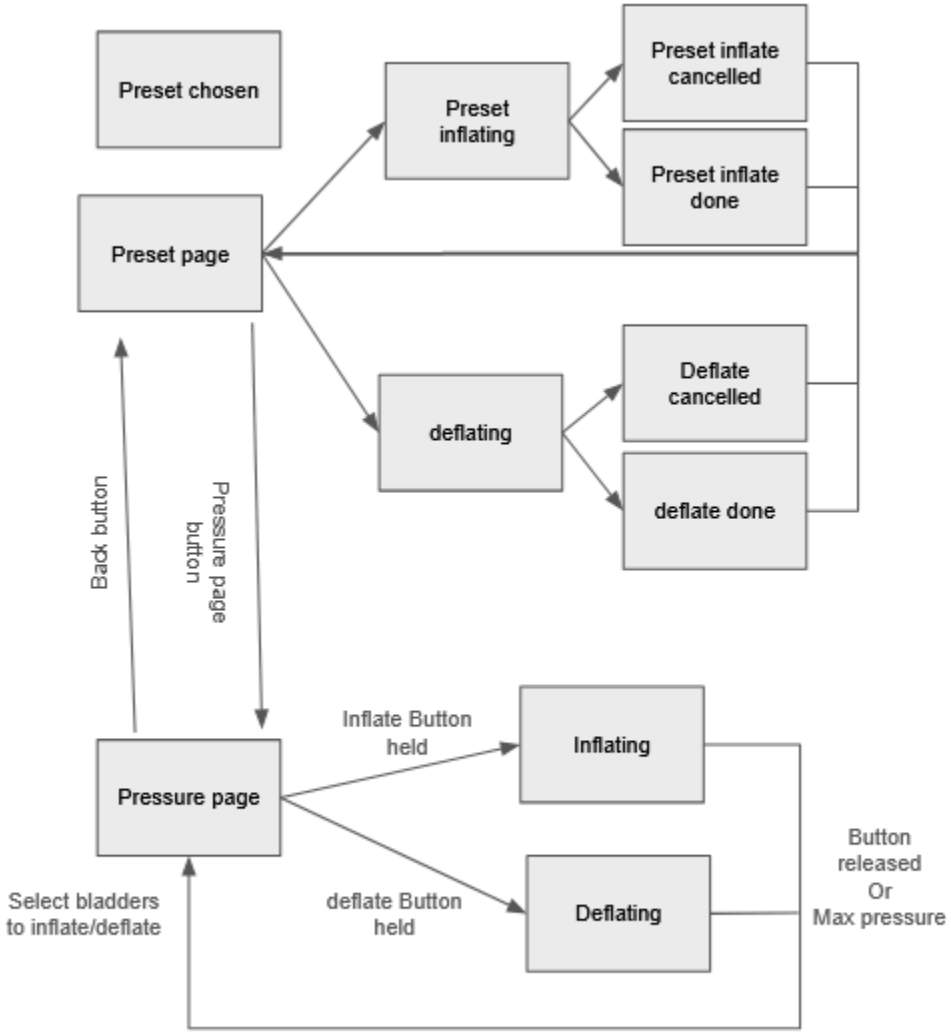
Device is a pneumatic device that is meant to inflate and deflate 49 bladders with input from user.
Control functionality of the device with inputs from a DWIN screen (which also uses UARTto communicate).
Has 2 modes, preset mode and pressure control mode.
In preset mode, when the user presses the inflate button, it will inflate the bladders in the desired pressure configuration.
In pressure control mode, the user will select the bladder they want to inflate/deflate. When they hold the inflate/deflate button, the chosen bladders will inflate/deflate. It will stop when either user releases the button or the bladders reach max pressure.
No more than 10 valves can be used at once(number should be configurable)
Board is meant to get pressure sensor readings from a sensor board through UART.

Rough State Machine Diagram



OTPD_state_machine.ino

In progress code for the main MCU for the full prototype

Features

Completed:

Skeleton for state machine

Logic for controlling valves to pump in stages to target pressures. For both preset and pressure control.(but has dependency on the target pressures setting which is not done yet)

Toggling pump direction

To be included:

Preset target pressures

Setting target pressure to preset target pressures

Pressure control choice storage

Pressure control max bladder limit

Getting inputs from the screen

Getting sensor readings from the sensor MCU (code can be found in OTPD_sensor_serial_reciever.ino)

Pump speed control

OTPD_proto_sensor_board.ino

Completed code for the sensor board for the full prototype.

Features

Control the multiplexers to switch between the sensors

Collect all 49 sensor readings (16*3 from multiplexer, one direct from pin PA3)

Reorder the sensors into the proper order (the wires connector for the sensor MCU board has its pin in GV1234567 format whereas the pins on the sensor peripheral board is in GV7654321 format)

Decode the sensor readings into a data format to be sent by serial to the main MCU