Hydroponics controller design spec

# PLC:

The PLC is responsible for the following tasks:

## Hardware:

* Turn on/off lights (x3)
* Turn of/off pump
* Turn on/off heater
* Turn on/off intake fan
* Turn on/off exhaust fan

## Software:

* Communicate with all sensor nodes via Modbus and get sensor readings from each.
* Send these ssenor readings to the thingsboard dashboard using MQTT
* Receive control setpoints for temp, humidity, c02 and pressure from thingsboard
* Run control algorithm for each parameter to maintain desired setpoint (which paramaters can be controlled depends on hardware available e.g. dehumidifier. First iteration may just be temperature control and pressure control using the fans.
* Automatically switch on/off the lights at set times
* Get light on/off times from thingsboard
* Automatically switch on the pump for a certain duration and at a certain period (i.e. switch on pump for 2 minutes every hour etc)
* Get pump duration and period from thingsboard