Yarn Dyer 0.2

# Purpose of Document

This document outlines the functional specifications and technical implementation of the Yarn Dyer project.

# Basic Goal

The Yarn Dyer is a standalone controller to set the temperature of a yarn dying bath. This will be intuitive to program and operate. The controller will maintain the temperature within ±1°C from a programmed set point.

# Hardware Implementation

The controller itself will be a box with 240V AC power in, controller 240V AC power out, and a temperature sensor on a long cable.

The box will have a mains power switch, a small display, and a rotary encoder with push button to control the system functions.

The power input will be a 10A IEC with a fuse.

There will be a 240V switch next to or integrated into the IEC.

There will be an unswitched 240V output.

The output may include an indicator neon.

# Controller Functions

Boot up

Set temperature

Set time

Start heating

Display heating progress

Cancel heating

Display heating summary (min, max, setpoint, time at setpoint)

Reset

# State diagram



# Pseudocode

|  |  |  |
| --- | --- | --- |
| State | State Name | Loop Code |
| 0 | Start | Display startup message  Check against timer  Move to state 1 when timer complete |
| 1 | Setup | Display Temp and Time on LCD  Accept user input for values  If user selects Run, move to state 2  If user selects Reset, move to state 6 |
| 2 | Run | Run heating sequence  Display progress  Check time  If user selects Pause, move to state 3  If user selects Cancel, move to state 4  If timer is complete, move to state 5 |
| 3 | Pause | Pause timer  Turn off heater  Display progress  If user selects Resume, move to state 2  If user selects Cancel, move to state 4 |
| 4 | Cancel | Turn off heater  Display progress  If user selects Reset, move to state 6 |
| 5 | Complete | Turn off heater  Display progress  If user selects Reset, move to state 2 |
| 6 | Reset | Reset time and temp variables to default  Reset all internal flags  Return to state 0 |

# Future versions

Wifi connectivity

Online logging

Android app