APPLICATION 2: PID TEMPERATURE CONTROLLER

PID temperature controller is a MATLAB GUI application. We have designed it to control and monitor the heat of the device. This application uses the Arduino object to get the temperature values of the device sensed by the LM35 sensor. You can sense the heat of transistor, coil etc. through this application and control it to the desired set point.

For this application, you will require these hardware components listed below-

Arduino Uno

LM35 temperature sensor

Power supply

Transistor, heater (to get variation in temperature values for monitoring and controlling).

Connecting wires

For the software, you will require Arduino IDE and MATLAB version should be above R2013b.

Connections:

Connect the Vcc and GND of the LM35 to the Arduino Uno 3.3V and GND.

Connect the A0 pin of the Arduino Uno to the LM35 data pin.

Connect the transistor or heater with a power supply and connect their data pin through resistor to any PWM pin on Arduino Uno board (prefer pin 3).

After this, connect your Arduino Uno board to your computer.

Download the application folder from the website (DynamicAnalytics.github.io).

Add it to your MATLAB directory.

Open the PID_GUI.m file and run it. It will show up the application interface.

The application has two modes Manual for open loop temperature monitoring and Control to control the temperature towards set point.

Choose the mode according to your requirement, click Start and observe the effects on graph and values in text box.

Screenshots of the application:

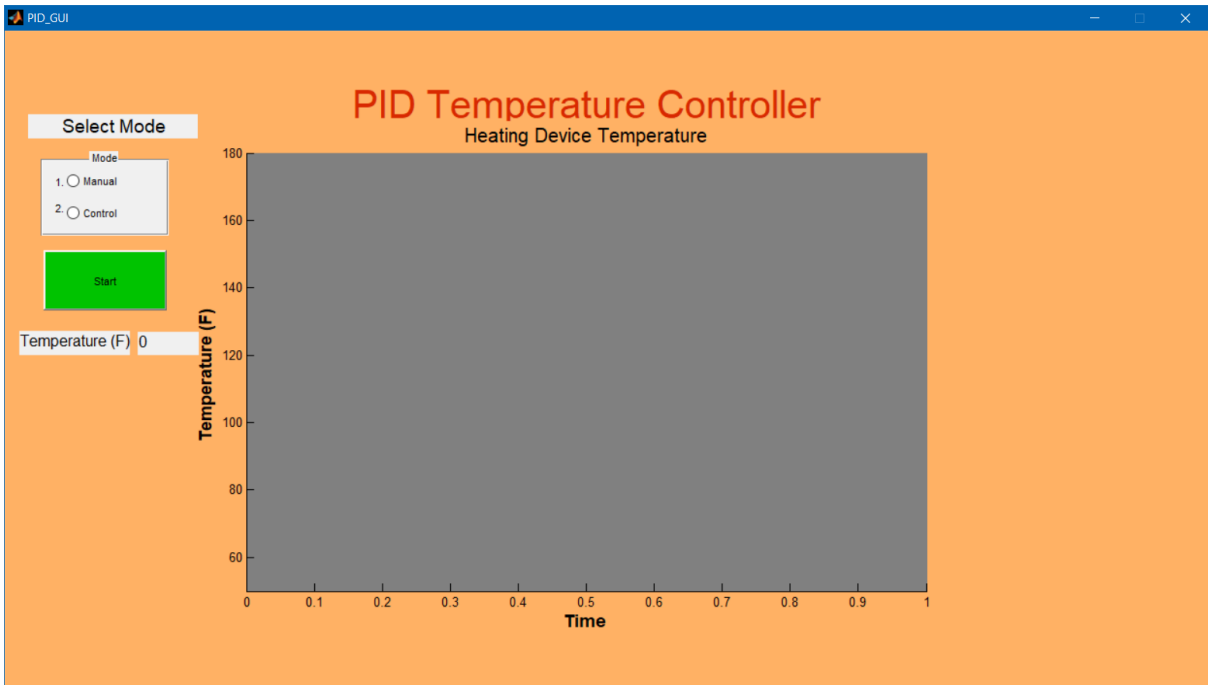

Fig 1: Application interface

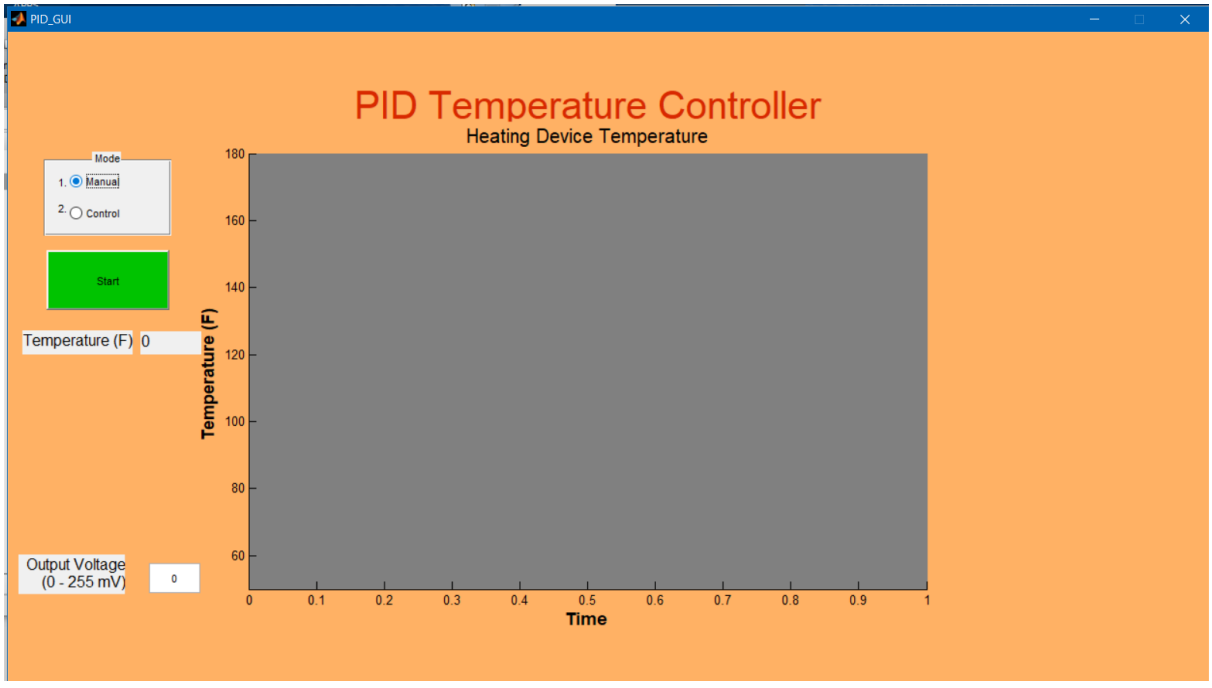

Fig 2: Manual mode

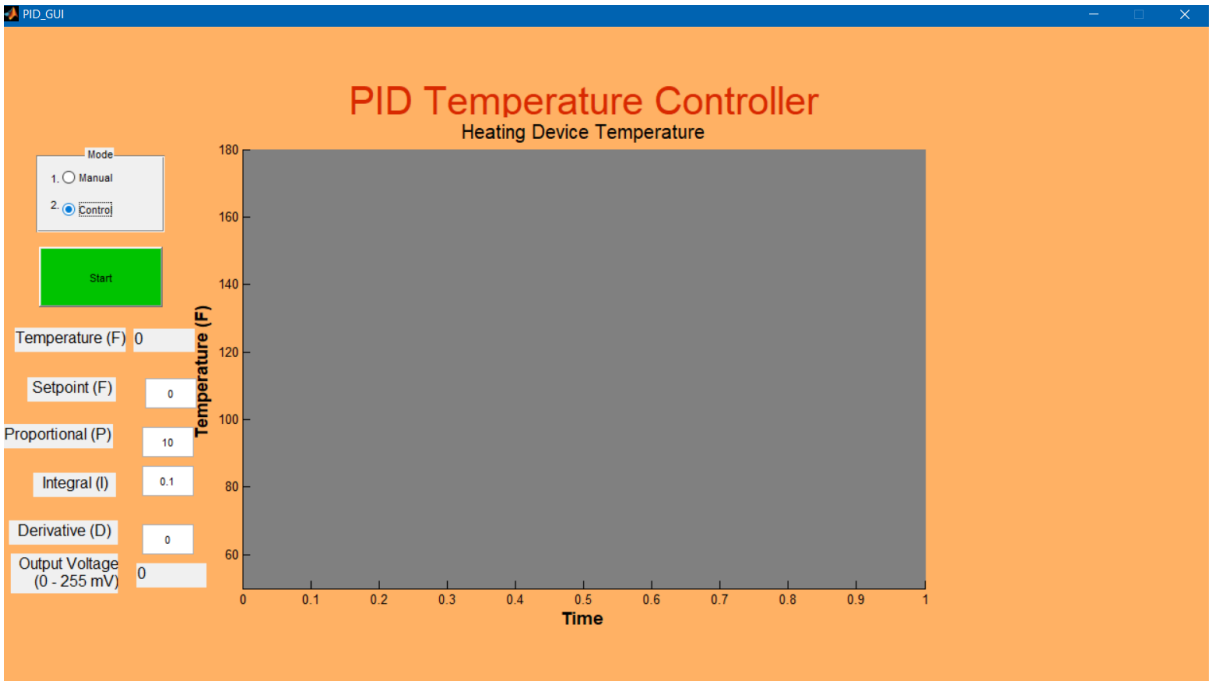

Fig 3: Control mode

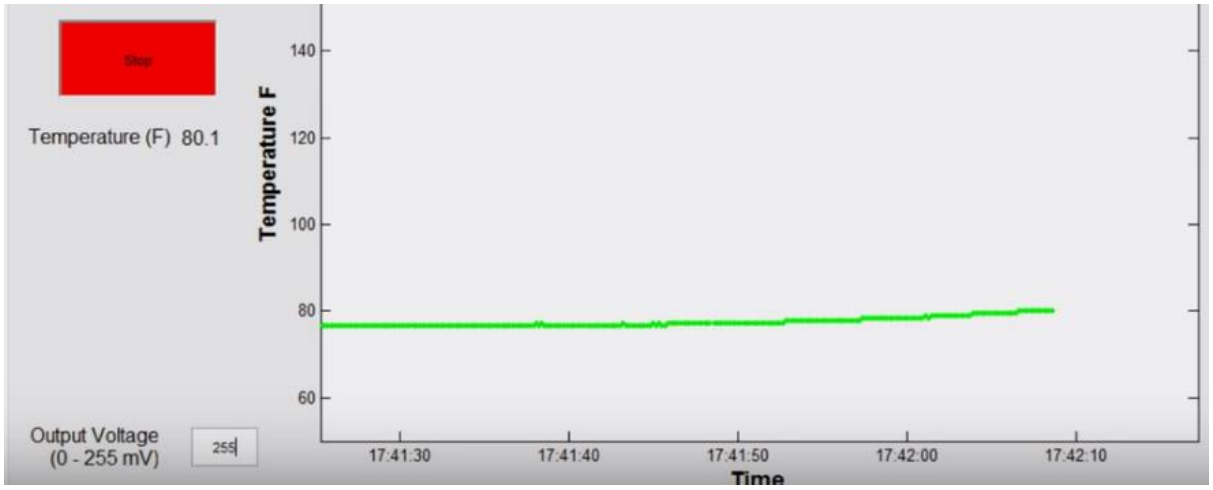

Fig 4: Manual mode graph

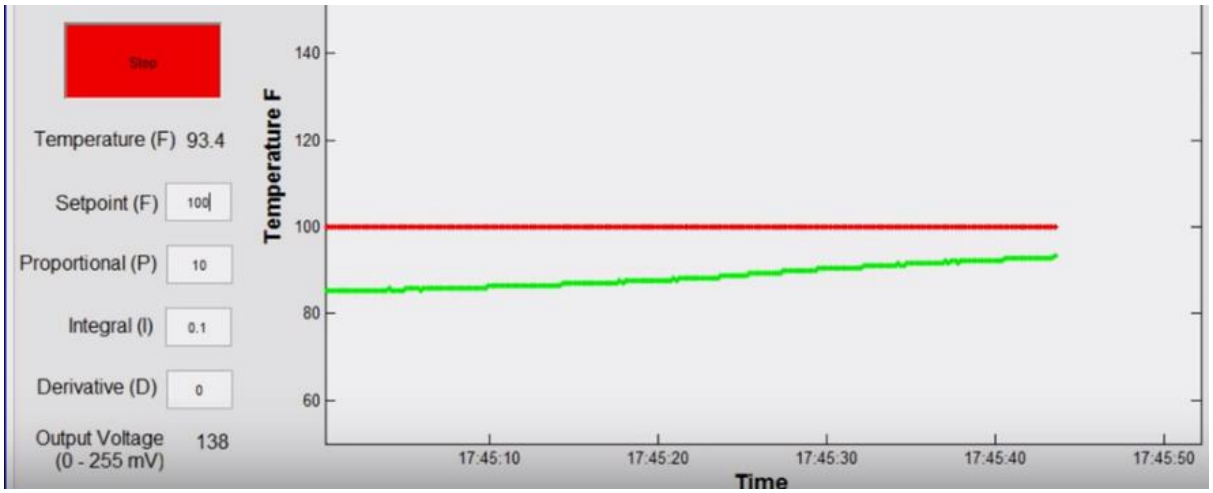

Fig 5: Control mode graph

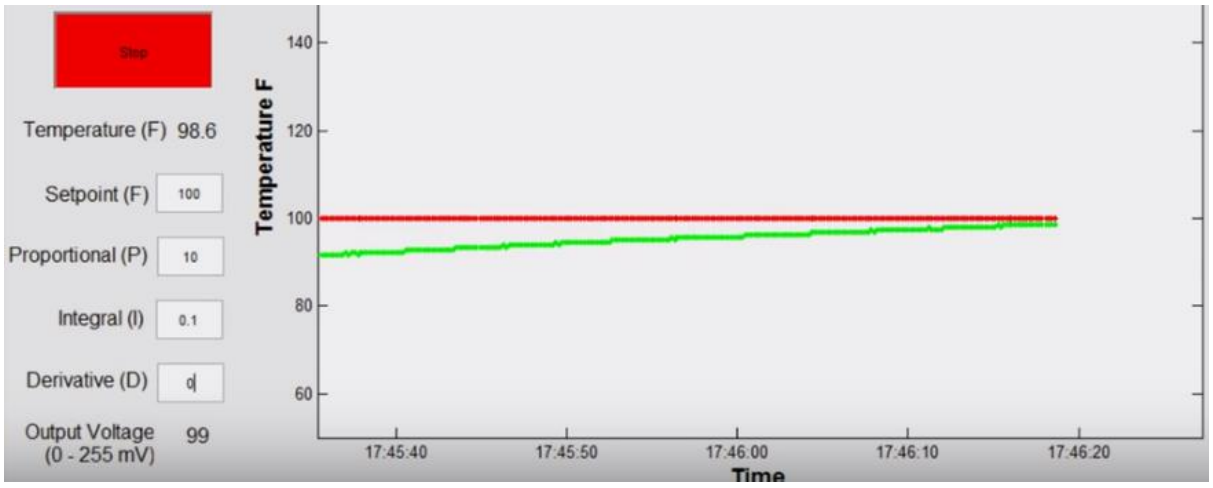

Fig 6: Control mode graph (close to Set point)