Special assignment: Central Heating System

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1 Introduction

The objective of this report is to analyze the system built for the mini project. The mini project is called AutoPlant and it is an automatic watering system for plants. It contains two main actuators and two sensors. The components used are: LDR, hygrometer, pump, LED strip, electronic power switch in the form of an N-FET, potentiometer, bipolar junction transistor, comparator (OP-AMP), slider switch, green LED, resistors and 12V power source.

The main concept of the project is to design the system such as it works based just on the properties of the electronics and to rely on code as few as possible. The final outcome is a system that uses solely the resistive properties of the sensors and it does not even contain a micro controller.

- The hygrometer used has typical input voltage 3.3VDC - 5VDC. Its specs can be found here: Hygrometer specifications

- For the power switch, the FET used is STU85N3LH5. The datasheet can be found here: N-FET Datasheet

- The potentiometer used has resistance 10kΩ.

- The LED strip has an operating voltage of 12V. The datasheet can be found here: LED strip Datasheet

- The LED has a forward voltage of 2,5V and a max current 20mA. The datasheet can be found here: LED Datasheet

- The pump has an operating voltage of 6V - 12V. Its specs can be found here: Pump specifications

The following schematic is created with Autocad EAGLE and the breadboard with Fritzing.

2 Schematics

2.1 Schematic

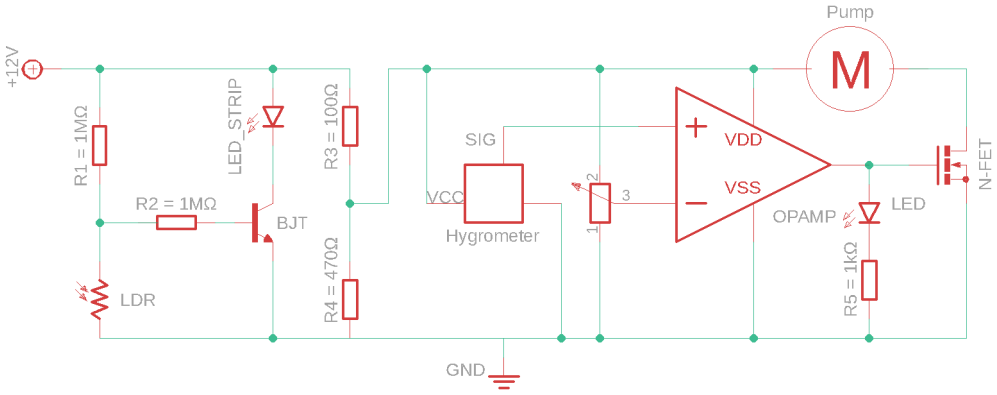

Figure 1: Circuit schematic

2.2 Breadboard

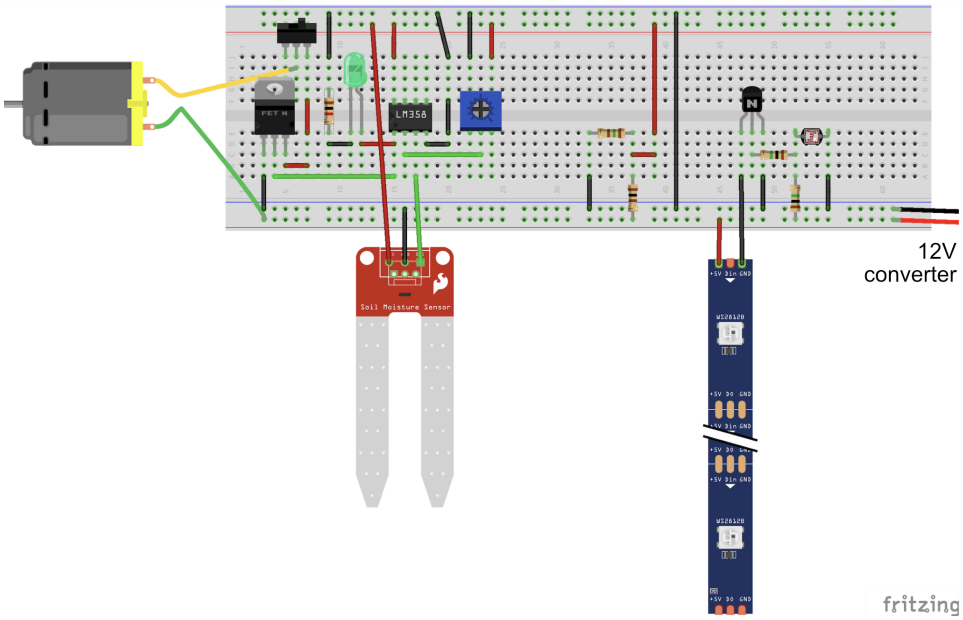

Figure 2: Circuit breadboard