VE373 Project Proposal

June 2022

Contents

I Description & Objective

The objective of this project is to develop an automatic pet feeder based on the PIC32 board. This automatic pet feeder should cover the following features.

- The feeder can release pet food automatically at pre-defined time in a day (e.g. 6am, 11am, and 6pm).
- The value of pet food of each release should be controlled.
- The frequency of the release should be able to be controlled.
- The feeder should be able to detect the value of pet food remained on the plate so that no extra pet food will be released if there is enough remained.
- The values can be controlled remotely by PC. PC should also be able to get the status of the pet feeder.

II Functional Block Diagram

The functional block diagram of our project can be summarized as the following diagram:

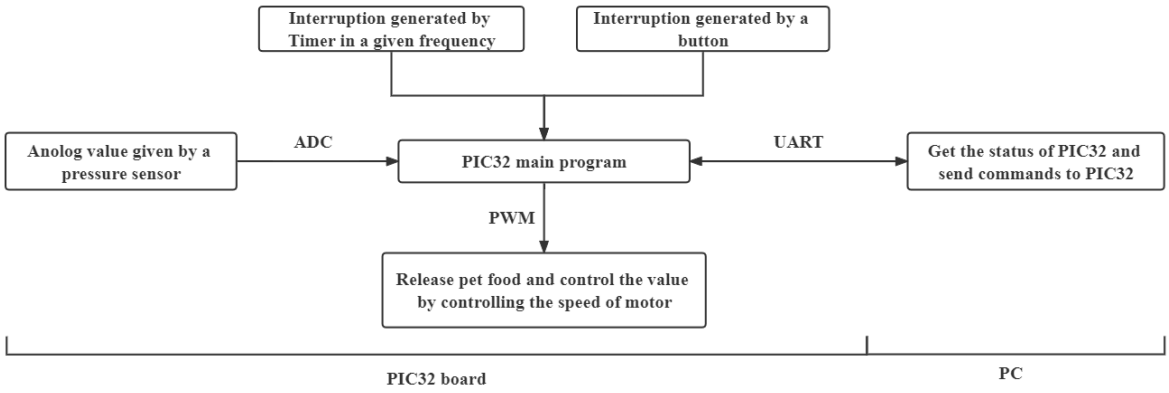

Figure 1: Functional Block Diagram

As you can see from this diagram, we will have these peripherals, ADC, UART, PWM in our design. We will also use timers to implement the fixed-time feeding function and use interrupts and input capture to realize button-enabled feeding function.
Detailed physical connections for each hardware component is shown in the next section.

III Component Level Diagram

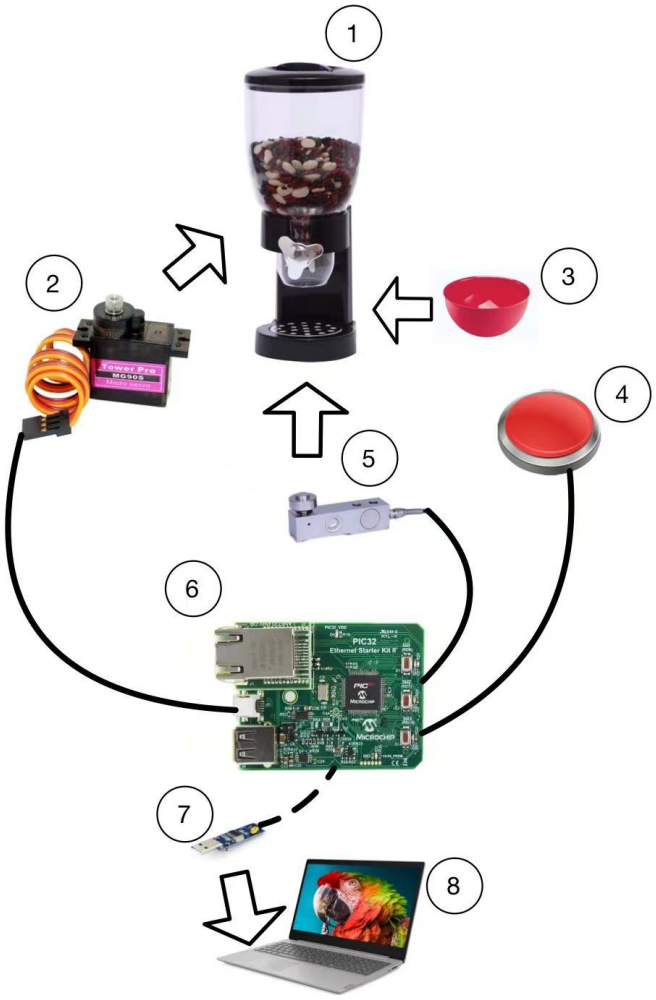

Figure 2: Component Connection

As you can see from the above diagram, PIC32 ⑥ is connected with the motor ②, the pressure sensor ⑤, and the button ④. And it can also communicate with PC ⑧ that is equipped with UART-to-USB converter ⑦. So PC can control the specific time for feeding. PIC32 can respond to the signal captured from the button and then additionally output some food if the button is pushed by the cat. The switch on the food container ① is rotated by the motor so that a pre-defined amount of food will be released into the bowl ③.

IV Preliminary Component List

- PIC32
- Pressure sensor (Weight scale): to measure the weight of food currently in the plate
- UART-to-USB converter: to transmit signals that can be received by users' computer
- Button: to enable the food container to output additional food when pushed by the cat
- Motor: to control the switch on the food container
- Plate: to hold the food

- Food container: to hold all the food and has a switch to be controled by a motor

V Preliminary Project Timeline

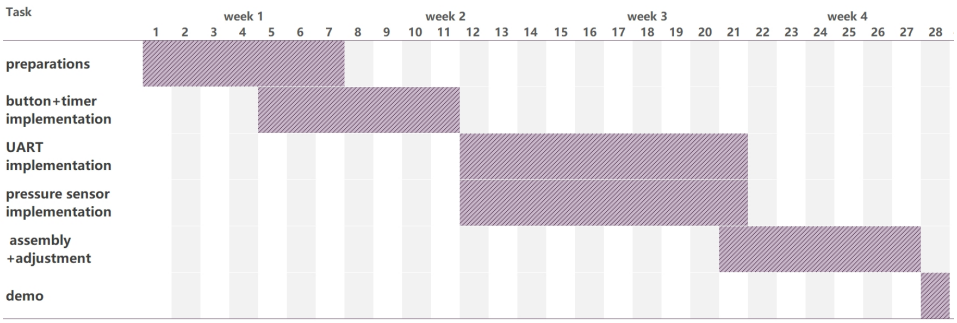

Figure 3: Gantt Chart