

Volume-6, Issue-9, September 2017 JOURNAL OF COMPUTING TECHNOLOGIES (JCT) International Journal Page Number: 04-07

Fish Feeder Automation Based on SIM900 GSM Module & Arduino

Ayush Pathariya^{#1}, Amber Pathariya^{#2}

¹Department of Electrical and Electronics Engineering, University Institute of Technology (UIT), RGPV, Bhopal, [M.P.] ²Department of Electrical and Communication Engineering Truba College of Science and Technology (TCST), RGPV, Bhopal, [M.P.]

¹a1029ayush@gmail.com

ABSTRACT - This paper devoted to fish feeder automation system using SIM900 GSM MODULE. Subsequently, this research was proposed to design automatic fish feeder system using AVR MICROCONTROLLER, which is heart of ARDUINO unit. The system combines mechanical and electrical system in controlling fish feeding activity .The disc rotate or control by an DC MOTOR. when SIM900 GSM MODULE receive the call from the user, then it will send an signal to the ARDUINO unit and the ARDUINO unit take suitable action based on the programming is done on the ARDUINO. When ARDUINO receive signal from the SIM900 GSM MODULE, then ARDUINO unit send the PWM signal to the DC MOTOR and shaft of the DC MOTOR rotate in predefined direction ,the shaft is connected to an mechanism. The purpose of the mechanism is to drop the fish food to the aquarium. This fish feeder automation is very helpful in AQUACULTURE and also reduces the labor cost .In short, on calling from phone anywhere in the world the food is delivered to the fishes.

Keywords-- ARDUINO, SIM900 GSM MODULE, DC MOTOR, AVR MICROCONTROLLER, AQUACULTURE, PWM

I. INTRODUCTION

The term Automation, inspired by the earlier word Automatic (coming from automaton), was not widely used before 1947, when Ford established an automation department .It was during this time that industry was rapidly adopting feedback controllers, which were introduced in the 1930s. Automation is defined as selfcontrol of equipment, systems or processes regulating without human intervention. These Ideas of automation hold favor with those technologists and lazy people who do not want to do tough work particularly manual operations. The scientific wizardry of achieving automations undoubtedly makes it apparent that the day will surely come when all of the things will be automatically operated.

It is true that most fish can miss a meal without being in any danger. Some fishes can easily go a week or more without food if they are healthy. As fish owners, it will determine how they are concerned about their fish while being away for an extended period of time. In addition, having to design and manufacture a fish feeder that can greatly assist fish farmers and the productivity of the farm can help them operate more without bearing too much of a cost on other things. The design project is that it will be also very inconvenient on the part of the owners when on vacation and for those

living a busy lifestyle because some sensitive and expensive fish normally need to be fed once or twice a day. Thus, the purpose of the research paper was to provide the fish owners a device that can actually feed their fish regularly whenever they are away or on a vacation for a while. These reasons led to the invention creation of an automatic fish feeder.

The majority of aquarium fish are omnivores, meaning they will eat both meat and vegetables. To keep the fish healthy, they must be fed with a varied diet that includes all types of foods. Here are some popular omnivores, with notes about their preferred diet.

Angelfish – Accepts all types of foods, but prefers live foods.

Goldfish – Accepts all types of foods, but diet should not be too high in protein.

Guppy - Accepts all types of foods, but prefers mosquito larvae.

Rams-Accepts flakes, pellets and live foods.

Koi – Accepts flakes, pellet and live foods.

http://www.jctjournals.com

When a person wants to feed the food to the fish and the person is in different country or anywhere in the world. Manually feeding to the fish by that Person is impossible .But by this automation a person feed the food to the fish anywhere sitting in the World. Person just have to missed call .When a user gives a missed call to sim900 GSM module which contain a SIM with a dedicated SIM number. Arduino unit match the user number and, if the number is match then Arduino unit send the signal to the motor to rotate, the dc motor. The signal send is an PWM signal, PWM Stands for pulse width modulation the PWM signal is important to maintain the speed of the dc motor and, if the number is not match then no action is taken is work for 6 days; placed. This automation



Normally Study says that the fish get two times food in a day .But it can be increased depending upon the missed call. The mechanical system is consisting of two discs like structure. One disc is made up of 12 sections and connected to dc motor. When dc motor rotate each section is rotates this section contain fish food. The best part of disc section is that we can adjust or control the quantity of food which is given to the fish. This disc is placed above other disc .The another bottom disc is contain a cavity. When the upper disc section meets with bottom disc cavity because of rotation of dc motor then the food is delivered to the fish. When food is delivered we will get a call from the sim900 GSM module which is an indication that successfully food is given to the fish.



Fig. 1 Used devices in Proposed Work System

II. PROPOSED METHODOLOGY

In our study SIM900 integrates TCP/IP protocol and extended TCP/IP AT commands which are very useful for data transfer applications. SIM900 provides two unbalanced asynchronous serial ports. One is the serial port and the other is the debug port. The SIM interface complies with the GSM phase 1 specification and the new GSM phase 2+ specifications for FAST 64kbps SIM card .Both 1.8v and 3.0 SIM card are supported. The SIM interface is powered from an internal regulator in the module. SIM900 GSM module provides the industry standard serial RS232 interface for easy connection to computers and other devices like Arduino etc. The SIM900 allows an adjustable serial baud rate from 1200 to 115200 bps (default it is 9600bps). It is suitable for SMS as well as data transfer application in M2M interface. Connect RX pin of the SIM900 GSM module to the TX pin of the Arduino and TX pin of the SIM900 GSM module to Arduino RX pin.



Copyright © 2017. JCT Publications. All Rights Reserved

Fig.3 Working Hardware modal

\



Fig.3. Flow Chart of proposed method



Fig, 4 Hardware of proposed method



Fig.5. Design Methodology Flowchart

III. CONCLUSION

This automation is combinations of SIM900 GSM MODULE and ARDUINO .The SIM900 MODULE receive the initialization command in the form of missed call .If this initialization command matches with the Pre-defined command which is stored in the ARDUINO unit. The ARDUINO unit gives a PWM signal to the dc motor for rotation from the PWM pin of ARDUINO. This PWM signal has fixed duty cycle for each rotation. At each time when food is delivered we receive a call which is an indication.

IV. FUTURE WORK

In future this automation is combined with the LABVIEW .The main advantages of the LABVIEW is the construction of Graphical User Interface (GUI) is simple and the operation is fast. Sensor will also combine with this automation to ensure that the health and growth of fish is maintained. Also try improve the performance of proposed system by using advance communication system like 4G and 5G TDLTE based. [09]

REFERENCES

- [1] Varad Varadi ,Mechanized Feeding in Aquaculture Inland Aquaculture Engineering, ADCP/REP/84/21, Food and Agriculture Organization (FAO), 1984.
- [2] Allen Goldblatt, "Automatic feeder for marine mammals", Laboratory for marine mammal Research University of Tel Aviv, 1992.
- [3] J.V Lee, J.L. Loo, Y.D. Chuah, P.Y. Tang, Y.C Tan, Goh, " The Use of Vision in a Sustainable Aquaculture Feeding System", *Research Journal of Applied Sciences Engineering* and Technology, vol. 6, no. 19, pp. 3658-3669, 2013.
- [4] M. N. Uddin, M Rashid, M. Mostafa, H. Belayet, S. Salam, N. Nithe, M. Rahman, A. Aziz, "Development of Automatic Fish Feeder", *Global Journal of Researches in Engineering: A Mechanical and Mechanics Engineering*, vol. 16, no. 2, pp. 14-24, 2016.
- [5] A Yousef, S Steven, L. Xiaoming, "Automatic Feeding Control for Dense Aquaculture Fish Tanks", *IEEE Signal Processing Letters*, pp. 1-9, 2015.

- [6] L. Wong, Redesign and Detail of Analysis of a Tiger Prawn Food Feeder, Bachelor Degree Thesis in Mechanical Engineering, University Tun Hussein Onn Malaysia, 2005.
- [7] Yeoh, F.S Taip, J. Endan, R.A. Talib and M.K Siti Mazlina." Development of automatic Feeding Machine for Aquaculture Industry". Department of Process and Food Engineering, Faculty of Engineering, University Purta Malaysia, 2009.
- [8] C.M.Chang, W. Fang, R.C. Jao, C.Z. Shyu, J.C. Liao, Development of intelligent feeding controller for indoor intensive culturing of ccl. Aquaculture Engineering, 2005.
- [9] Yadav P., Sharma S., Tiwari P., Dey N., Ashour A.S., Nguyen G.N. "A Modified Hybrid Structure for Next Generation Super High Speed Communication using TDLTE and Wi-Max" for publication in *Studies in Big Data, Springer* 2017.
- [10] Bremer, Auto Fish Feeder Feeds Fish Automatically, October 2014.
- [11] http://www.ehow.com/howdoes_4674240_automatic-fish-feederwork.html
- [12] <u>https://electronics.stackexchange.com/questions/123240/powerin</u> <u>g-sim-900</u> gsm
- [13] <u>http://www.circuitstoday.com/interface-gsm-module-with-arduino</u>
- [14] <u>http://www.instructables.com/id/Interfacing-SIM900A-GSM-Modem-with-Arduino</u>
- [15] https://www.arduino.cc/en/Reference/HomePage