

AUTOMATIC CLOTH RETRIEVER SYSTEM

Lumitha Seema Cutinha¹, Manasa k² Venkatesh Pai³, Sadhana B⁴

^{1,2,3}Student, Information science & engg, Canara engineering college, Mangalore, India

⁴ Assistant professor, formation science & engg, Canara engineering college, Mangalore, India

Abstract- For a working couple, it is hard to find time to have laundry day where the cloth is dried through the whole day because the weather can change from sunny to rainy days. This paper use Microcontroller PIC16F877A to install all programs that will give instructions to conduct this system properly. This paper will introduce the techniques which will automatically retrieve-out the clothes when it is the sunny day and oppositely retrieve-in the clothes when it is a rainy day. This part needs DC motor to convert electrical power into mechanical power for retrieve-out and retrieve-in all the clothes. Temperature sensors that will be used here can measure temperature and day condition whether it is sunny or rainy day more accurately. LDR (Light Dependent Resistor) sensors will be used to detect light intensity. Rain detector will be used to sense when it begins to rain outside by detecting rain water from moisture impedance sensor locate at the rod. The dry-time of the clothes will be setup using rotary knob switch and it will automatically retrieve-in the clothes using DC motor when the dried-time is finished. Here we will display the day condition, temperature and dry-timer using LCD (Liquid Crystal Display) or indicator light such as LED (Light Emitting Diode).

Keywords: PIC microcontroller, temperature sensor, impedance sensor, rain detector sensor, Light dependent sensor, DC motor, GSM module.

1. INTRODUCTION

People often forget to lift the suspension of clothing during the day rain. For people who working, they don't have to worry about their clothes that have been dried outside. People often don't have time to manage their routine. This project develop for working couple, it is hard to find time to have laundry day where the cloth is dried through the whole day because the weather can change from sunny to rainy days. This projects use Microcontroller PIC 16F877 to install all program that will give instructions to conduct this system properly and will automatically retrieve-out the clothes when it is the sunny day and oppositely retrieve-in the clothes when it is a rainy day.

This part needs DC motor to convert electrical power into mechanical power for retrieve-out and retrieve-in all the clothes. Temperature sensors that use in this project can

measure temperature and day condition whether it is sunny or rainy day more accurately. LDR (Light Dependent Resistor) sensors use to detect light. Rain detector use to sense whether it rain or not at outside by detecting rain water from impedance sensor locate at the rod. The dry-time of the clothes will be setup using push button and it will automatically retrieve-in the clothes using DC motor when the dried-time is finished. For status display, this project will be display the day condition, temperature and dry-timer using LCD (Liquid Crystal Display) or indicator lights such as LED (Light Emitting Diode).

2. RELATED WORK

2.1 Rain Tracker Rain Gage - Model RG-10

The Rain Gage RG-10 senses using beams infrared light. The RG-10 is suitable for almost any application that requires reliable and sensitive rain sensing, including automatic retraction of awnings, boat and ship window wiper control, and wiper control for specialized vehicles and equipment. The RG-10 senses the drops directly, and is thus able to detect a much smaller amount of water.

2.2 Outdoor Retractable Laundry Hanger

Outdoor laundry system equipped with German technology and can work perfectly to solve problem drying our laundry and make the clothes dry under the sun or indoor when it rains. This system is highly suitable for residents staying in high rise flats and apartments due to limited space constraints. This system work simply on a German gas spring and roller bearing from Japan, this system sit flat to the ceiling when not in use, and it makes maximum use of the air space in our home.

2.3 Temperature Control System

This deals about temperature control system which is a particular system for Server room. This system consists of temperature sensor, PIC, LCD (Liquid Crystal Display), driver circuits, AC air heater and AC motor. This motor operated based on two levels of speed and functioning for controlling the temperature value inside of a regular room automatically. This system would operate based on values or ranges of the temperature inside the room that would be detected by using the temperature sensor.

2.4 Rollout Awnings

Rollout awning is made up of all heavy American made stock components, thick, white epoxy/PVC coated/full bath dipped over heavy aluminum alloy frames. This awning arms have Triple-Angled- Elbows with Triple-Springs sealed inside for water tightness providing Triple Strength and added stiffness for maximum use on windy beach fronts. They can be rolled up even when wet without forming mildew and provide the highest longevity for awning material used in roll out awnings.

3. PROPOSED SYSTEM

The proposed system will automatically retrieve-out the clothes when it is the sunny day and oppositely retrieve-in the clothes when it is a rainy day. This project is done by developing the circuit of Light Dependent Resistor which could detect the sunny day and rain detector circuit to detect whether it is rainy day and programming the controller to control the motor to retrieve-out the clothes when it is sunny day and retrieve-in the cloth when it is rainy day.

The dry-time of the clothes will be counted and it will automatically retrieve-in the clothes when the dried-time is finished. The dry-timer was set by user whether 3 hours, 4 hours or 5 hours. This project will be display the day condition, temperature and dry-timer. Day conditions will display sunny, cloud or rainy. It is depend on the current temperature range that has been set by programming. Also could display dry timer that has been set by user.

This project concentrates on controlling the automatic cloth retriever system based on current temperature range, day condition, rainy day or sunny day. Retrieve-in when dried-time is finished, rainy day, no sunny day and temperature below than 25°C. Rotate 90 degree for retrieve-in and retrieve-out. Use hardware and software tools to identify and control the cloth retriever system.

4. SYSTEM DESIGN

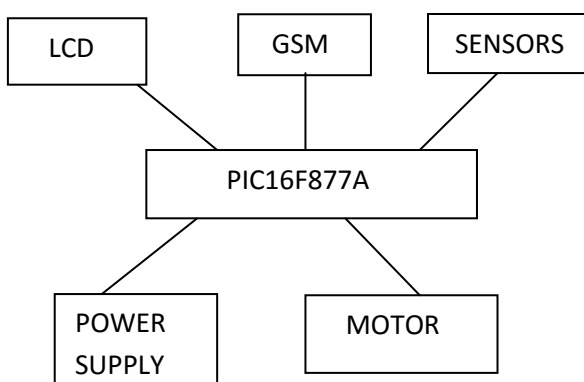


Fig 1: Block diagram of the system

Fig 1 explains the overall connection of the hardware. PIC16F877A microcontroller is connected with sensors like rain detector sensor, impedance sensor, LDR sensor, temperature sensor to the sense the values from the atmosphere based on which hardware will work, and a connection is given to the LCD to display the present sensed value and the status of the device, GSM module is used to send the message or call to the user or we can view the status of the device using internet, power supply is connected using step down transformer, motor along with relay is used for the movement of the device.

1. Microcontroller:

Here we are using PIC16F877 Microcontroller. It has got power on reset (POR) button. Operating speed: DC - 20 MHz clock input, DC - 200 ns instruction cycle Direct, indirect and relative addressing modes

2. Sensors

> LDR Sensor : LDR sensor is used to measure the intensity of light. It is used as the source of light.

> Impedance Sensor: DHT11 is used as the impedance sensor. It is used to find the moisture in the atmosphere.

> Temperature Sensor: LM35 is used as temperature sensor. It will sense the atmospheric temperature. According to the threshold value set for sensors, device will work.

> Rain Detector Sensor: Rain detector sensor if it rains, will sense the water droplets on the device and will send value based on which device will come inside.

3. LCD display:

LCD stands for Liquid Crystal Display. Here we are using 16*2 LCD display to display the sensing values and the status of the device.

4. Power Supply:

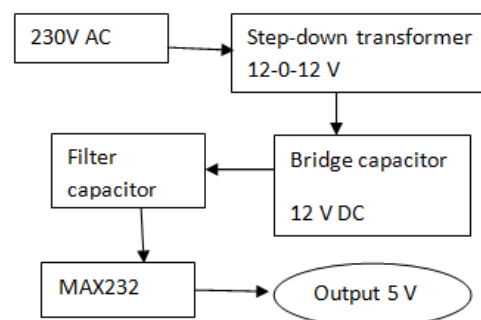


Fig 2: Power Supply

Regulated power supply from a 230 V AC is given to the hardware using Step Down transformer which reduces it to 12V AC. It is then fed to bridge rectifier which converts into 12V DC. Filter capacitor removes AC component and regulator supplies only 5 V to the IC can be seen in the above Fig 2.

5. Motor:

Motor along with relay is used here for the movement of the hardware. Based on the sensor values the device should move in or Out which will be done by the DC motor.

6. GSM :

SIM900A GSM module is used here for the communication of the user with the system’s module mainly works with AT(Attention) command. Using GSM, the device based on condition given condition will either call or send message to the user. Using GPRS technology user can view the status of the device by logging into the website.

7. Crystal Oscillator:

A crystal oscillator is an electronic oscillator circuit which uses inverse piezoelectric effect. They have high stability, quality factor, and small size. We are using 20MHz crystal oscillator. The additional capacitor on either side of crystal is basically to dump unwanted oscillation modes. When it’s started up a crystal oscillator is basically fed a noise pulse, and the rest of the passive components in the circuit have to act quickly to attenuate all unwanted frequencies down to ground.

5. IMPLEMENTATION

The hardware will mainly works based on the values provided by the sensors used in the project. . In Fig 3 we have connected GSM module, LCD display, pic microcontroller along with sensor. If the value is exceeding the threshold value using DC motor the device will automatically moves out to the sunny region. If the sensed value falls below the threshold value then the device is moved inside using the motor

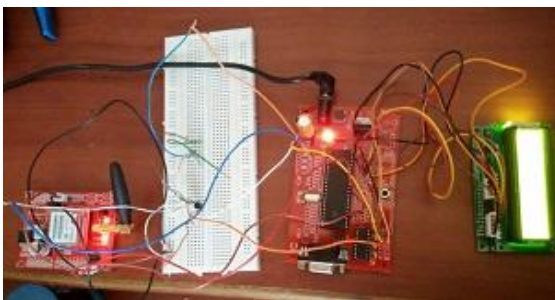


Fig 3: Implementation of the device

GSM module:

GSM module is used for transmission of messages between hardware and the user. Here we are using SIM900A module which can be used both for GSM and GPRS technology. After the interfacing of the device with hardware is done as shown in Fig 4 we can get message from the hardware about the status of the device using GSM techniques. Using GPRS we can login to the website designed for the hardware and can view the current status of the device and other parameters which are sensed by the various sensors used

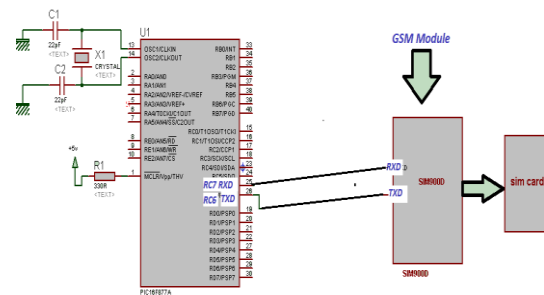


Fig 4: Interfacing GSM with PIC microcontroller

GSM modem is controlled using AT(Attention) commands. HyperTerminal, a terminal emulation program is used to connect GSM. Based on the sense value the state change of the device is informed to user either by call or message.

Example:

```
ATD 1234567890; //calls the user
AT+CMGF=1
AT+CMGS="9xxxxxxxxxxxxx"
>message //used to send text message
```

6. RESULTS

The hardware based on the sensed value checks for the threshold value and performs the action needed that is moving out and coming in. The working of the hardware can also be viewed by the user, if he is not near the device. Using the GSM module which has SIM will send message or a call to the specified user.

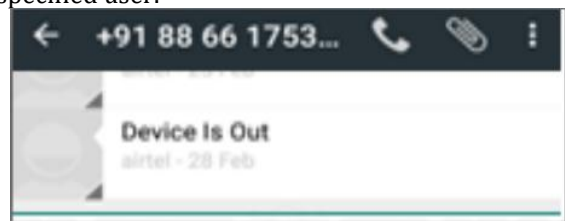


Fig 5: message from the hardware using GSM

The above Fig 5 shows a sample message which the user of the hardware will get. When the threshold condition is met for the hardware along with the movement of the hardware it will send message to the user about status of the device that whether it is in or out.

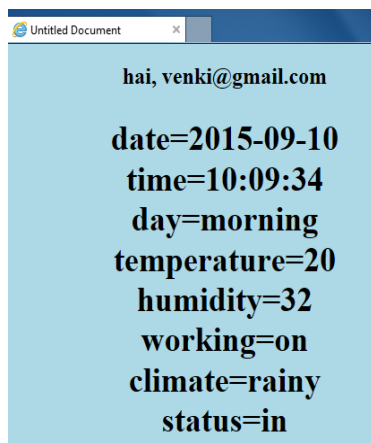


Fig 6: sensed values in the website

The above Fig 6 shows the values which will be displayed in the website. These values are the sensed values from the sensors which will be send to the database after interfacing with the hardware.

When we login to the website the current status of the device, sensed values from the sensors will be displayed. So if we are outside also, we can login to the website and we can view the status of our device.

7. ADVANTAGES

The main advantage we can mention is time saving. The device will reduce our work and save our time. It is compatible with climate changes as the sensors are used, the device can easily recognize the climate changes.

As the device is simple it can be used by any kind of user. This prototype is less expensive. People often don't have to change their routine. This project is useful for working couple, who don't find time to have laundry day where the cloth is dried through the whole day because the weather can change from sunny to rainy days.

8. CONCLUSION & FUTURE WORK

For a working couple, it is hard to find time to have laundry day where the cloth is dried through the whole day because the weather can change from sunny to rainy days. This project will automatically retrieve-out the clothes when it is the sunny day and oppositely retrieve-in the clothes when it is a rainy day. By making use of GSM module it should able to send message to the phone about the status of the hardware or by logging into the website designed for the hardware.

The dry-time of the clothes will be counted and it will automatically retrieve-in the clothes when the dried-time is finished. This project will be display the day condition, temperature, humidity and device status. To use GSM/GPRS module to view the status of the device through messaging using GSM .We can also view the hardware condition using the internet by logging into the website.

This project can withstand 5 kg of clothes on the rod which can be enhanced to more weight. Also by using the arduino microcontroller, website can pass commands specified by the user like manual switch off or in and out actions of the device etc.

REFERENCES

- [1] Fu, Jianlong and Wang, Jinqiao and Zechao and Xu, Min and Lu, Hanqing. Efficient clothing retrieval with semantic-preserving visual phrases. In Proc. of ACCV. 2013.
- [2] Nghia Truong Van Dept. of Electron. & Electr. Eng., Dongguk Univ Seoul, South Korea Seung Joon Lee; Chang Won Lee; Ki Hwan Eom ;Kyun Kwon Jung; Outdoor retractable Laundry hanger.2013
- [3] Yamaguchi, Kota and Kiapour, M Hadi and Berg, Tamara L.; PaperDoll Parsing: Retrieving Similar styles to parse clothing items;In Proc. of ACCV. 2013
- [4] Shen, Xiaohui and Lin, Zhe and Brandt, Jonathan and Avidan, Shai and Wu, Ying. Object retrieval and localization with similarity measure and k-NN re-ranking.2012
- [5] Chen, Huizhong and Gallagher, Andrew and Girod, Bernd. Describing clothing by semantic. attributes. In Proc. of ECCV.2012
- [6] Hamada, T. Ind. Technol. Center, Takamatsu, Japan Hata, S. ; Hojoh, H. ; Kobayashi, H. ;Hata, S. ; Hojoh, H. ; Fukumoto, Flexible Handling robot system using 3D sensor. 2011.



LUMITHA SEEMA CUTINHA
Student of Canara Engineering
College, Information Science
Department.