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DATA LOGGER FOR AUTOMATIC WEATHER SYSTEM

Saurabh Baviskar, Swaraj Misal, Vivek Jadhav, Mayur Maskar,
Prof.M.R.Wanjre

ABSTRACT

In our daily life, the weather monitoring plays an important role. The data logger are electronic devices which helps to monitor real time parameter and to save the data for further use. Thus it simply combines the two fields based control & data acquisition system. In AW system, the various sensors are used such as rainfall, pressure, humidity, temperature , wind speed which reads & store this data which finally display on LCD .our main aim is to display the data in real time technology which is challenging to us. It help to get intelligent observation ,accurate forecasting & reduces manual errors due to automation. The monitoring of weather parameters in the climate can be done using the AWS .The design of such system is discussed in this paper. The whole system governs various locations according to the periodic changes that occurs in the atmospheric conditions, to keep proposed locations in desired weather condition. Finally, the system measures various atmospheric parameters through sensors & uploads the measured data to the controller, where it can be accessed.

Keywords— Weather monitoring, Sensors, PIC controller, charge controller.

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I. INTRODUCTION

[1] The aim of the project is to develop a Data logger which will senses atmospheric parameters. In traditional system there where many problems like manual observations were taken which leads to various errors like time delay this type of system where having limited storage capabilities and man power that was required. But automatic all such errors are controlled and man power required is also reduced to large extent. This type of automatic system can be used in flights so that to determine the weather and help to take off in a good weather without any problem after. It is also used in weather forecasting, in farming so according to rainfall it can help farmer to do farming , in dams water release according to the rainfall. In this way such system are been used. The automatic weather system uses the sensors like temperature, pressure , humidity, rainfall , wind sensors which are the required parameters for the automatic weather stations. Led are used for indication of power , Wi-Fi for sharing of the data , solar for power and charge controller for controlling the input charge. The automatic weather station will take the reading manually , it can share the reading or data through the Wi-Fi module and we are also having the charge controller for the supply ,charge controller for the required supply without fluctuations so this will automatically take the reading of atmospheric parameter and store and then it is shared through the Wi-Fi module and supply is provided by charge controller. The components used are sensors like temperature, pressure, humidity, rainfall, wind. We have WI-FI module for transmission of data , charge controller to provide charge,

LCD to display date and time , solar panel to generate the energy for the system , keypad is used to edit the date and time on the LCD display , PIC to assemble all this components so this are the components of the automatic system. In this system the all the sensors are connected to the PIC , solar panel to the charge controller and charge controller to the PIC , LCD display to the PIC and pc is connected to Wi-Fi module and Wi-Fi module to the controller and led for the indication are connected.

II. PROBLEM STATEMENT

To develop a data logger system which will fetch the real time sensor reading, store and transmit the data through the Wi-Fi module.

III. OBJECTIVES

- To monitor various atmospheric parameters.
- To display real time parameters.
- To store the daily data for future study.

IV. PROPOSED WORK

- **BLOCK DIAGRAM:-**

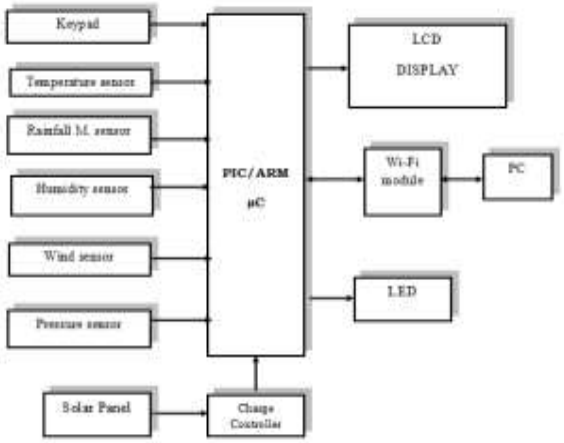
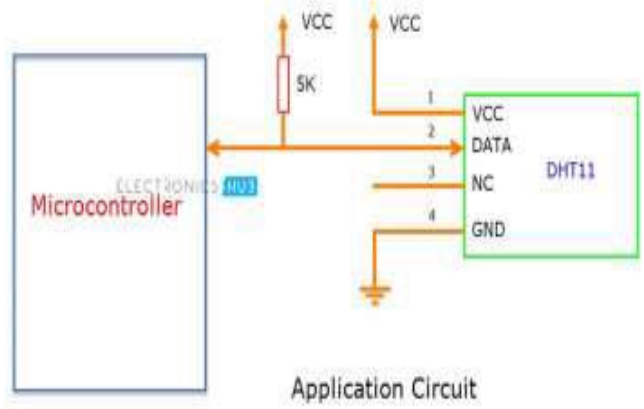


Fig 4.1 Block Diagram

- **SPECIFICATIONS:-**

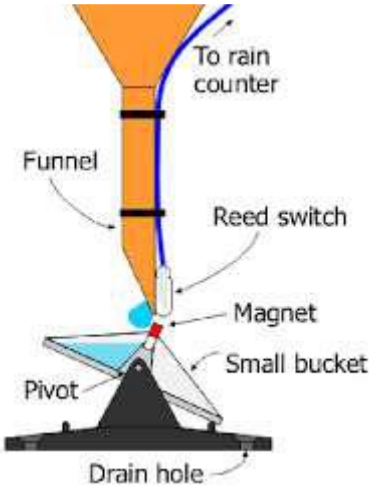
[5] **1.Types of sensors**

- Humidity And Temperature Sensors:-



Supply voltage:5V DC
Temperature range:0-50ºC
Humidity:20-90 % RH

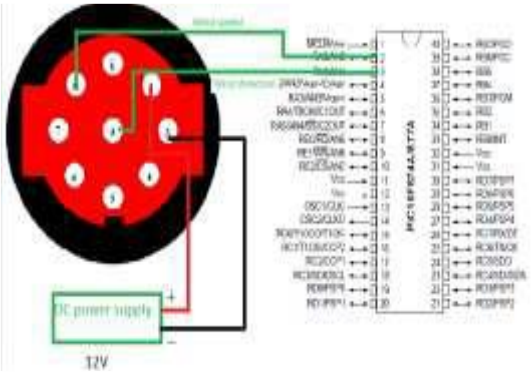
- Rainfall Sensor:-



Supply:5V DC
Tilting bucket arrangement
Magnetic material to count number of tilts
Number of tilts is proportional to rainfall

- Wind Sensor:-

- Wind Sensor Circuit:-



- Pressure Sensor:-

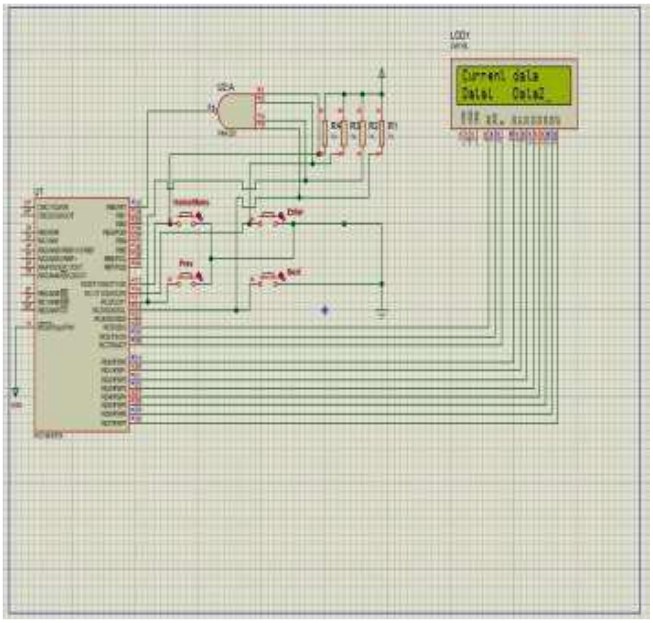
2.Keypad:-

It is used for to change the real Time Parameters On The LCD, mode select, navigate time setting.

3.Solar Panel:-

[3] It absorb solar radiation and charge the Battery for further use.

V. HARDWARE DESIGN



VI. SOFTWARE DESIGN

- The software we used for our project is python.
- It is one of the open source applications freely available on the internet.

Python is the fastest growing programming language among the engineers, mathematicians ,data analyst, scientist, accountants etc. It can be used for data analysis , artificial intelligence ,automation .It can be also used for web apps development, mobile apps , desktop apps ,testing . Python is a multiple purpose language . Python is a high level language it has cross platform and large ecosystem .So Python can be used in the programming of the sensors with the controller.

AFTER ANALYSING THE DATA DAILY AVERAGE OF DATA IS CALCULATED:

Date	Avg Rain(in mm)	Avg Temp(in deg cel)	Max Temp(in deg cel)	Min Temp(in deg cel)	Wind speed(km/hr)	Wind dierction(deg)	Pressure(hpa)	Battery(Volts)
18-Mar-19	0	26.8	32.8	21.5	1.5	161	1012.1	13.2
19-Mar-19	0	27.4	34	21.8	1.5	174	1009.6	13.2
20-Mar-19	0	28	34	23.5	1.8	137	1010.1	13.2
21-Mar-19	0	27.6	33.7	21.9	1.6	146	1011.5	13.2
22-Mar-19	0	27.5	33.7	21.6	1.4	219	1011.3	13.2
23-Mar-19	0	28.3	35.2	22.8	1.6	223	1010.2	13.3
24-Mar-19	0	28.9	36.2	24.2	1.4	160	1009.9	13.3

Avg Temp for 7 days:27.8 deg cel
Max Temp in last 7 days:36.2 deg cel
Min Temp in last 7 days:21.5 deg cel
Avg Battery voltage for 7 days:13.2V
Done

If sensors are faulty they are detected and mentioned in the alert file:

```
Following issues were observed:

Battery overcharged on:18 March 2019
Battery overcharged on:19 March 2019
Battery overcharged on:23 March 2019
Battery overcharged on:24 March 2019

Maintainance required
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VII. EXPECTED RESULTS

It must include the tables and graphs that shows the quantitative result (Should cover comparison analytical or statistical result from literature survey and expected result for proposed system)

VIII. CONCLUSION

The prototype AWS, if eventuated into a finished product, can be a great asset for weather data monitoring especially for renewable energy projects which require weather data measurements at remote locations. The remote measurement system, wireless data communication, data logging and display, and good conformity of measured weather data to those obtained using a similar measurement device would make this an ideal choice. A number of future works are being planned to increase the applications and suitability of this work. More rigorous experiments are required to test the suitability of the solar panel with fluctuating weather conditions and weather proofing the electrical and electronic units. Transfer of data over GSM/GPRS networks using respective modules for greater coverage and range is being looked at. It could also be eventually used to provide weather data to subscribers as text messages on their mobile phones. Measurement of more

weather data such as soil temperature, solar radiation, wind direction, sunrise, sunset, atmospheric pressure, etc is also being considered. With plans for expanding the range of weather data being measured, the power requirements will also increase for the remote unit. This could be catered for by modifying the operation of the system to save energy such as switching the power off to all the weather measurement devices when weather data is not to be measured, except those that require continuous measurement such as the rain gauge. Other options such as solar tracking, employing backup battery, and connecting an additional solar panel may also be considered.

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