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Basic Automatics Weather Instrument

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Abstract

This paper presents basic automatic weather instrument. The development and measurement of data logger, temperature and humidity measurement with DHT11, pressure with BMP085 and raingauge using techniques weighing with load cell. In addition, the instrument is able to send send the information that is available through the cell phone to a WiFi connection and send it to application Line, and measure the amount continuously, and using power supply by solar cell. Consequently this technique can be immediately used in measurement weather. Moreover, it is low cost, easy to use, and portable.

Keywords: Weather Instrument, Pressure, Raingauge, Humidity, Temperature

1 Introduction

Immediate weather information is important for application in agriculture, flood protection, soil and water management etc. But most weather instruments are expensive and are imported from overseas, does not cover common area. It is important to get the right information, especially to keep the farmers informed about the risks and opportunities in the near future so that they have time to deal with them. It should be prioritized for climate information such as rainfall, temperature, air pressure, etc. It is important because it is an input to be used to analyze the risks.

From this problem, it is proposed to research and develop an automatic weather instrument that can transmit signals via wireless sensor. By using either electric or solar power sources and battery power storage. The instrument consists of a temperature humidity, atmospheric pressure, and rainfall sending information over the Internet. Processed and controlled by a microcontroller based on conventional electrical power and can use renewable energy from solar cells and batteries. And can be applied as part of the agricultural decision support system. The advantages of the invention are that they are easy to install, easy to maintain and easy to maintain. This affects the quality of life and society. It also reduces the import from abroad is very expensive. Including the technology of the basic weather instrument research and development itself. This will reduce the import of expensive tools from other countries.

2 Materials and Methods

2.1 Basic Weather Station Design

Design of automatic weather instrument consists of a weighing cell with a load cell. Temperature and humidity measurement with DHT11, pressure with BMP085 processed by a microcontroller and backed up as a database on a memory card (SD Card) can be displayed with a 20x4 LCD screen character. The data is sent through the WIFI module for sending readable data and can be made using solar cells and batteries. The battery is used to store electricity from solar cells. The Solar Charge Regulator is a 20 watt Battery and control panel as shown in Figure 1.

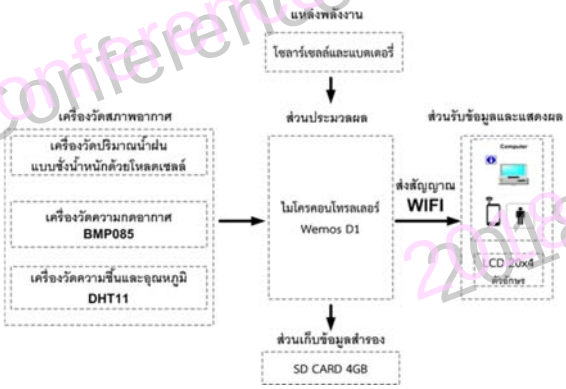

Figure 1 Features of Automatic Weather Instrument

2.2 Raingauge

The characteristics of rain gauge based on rainfall measurement techniques. The function of the rain gauge is to use a load cell. The load cell (Load

cell) is a device used to measure labor or weight. The load cell system changes the force or weight into electrical signals. (mV/V) based on the principles of the Wheatstone Bridges. When the circuit is in equilibrium, the output voltage is zero. However, when weighed or pressed on the platform, the strain gauge is stretched and flexed. Most often, 4 gauge gauges are used. Two gauges are pulled and the other two gauged. When the resistance in the strain gauge changes. The bridge circuit causes an imbalance.The output voltage occurs. According to the proportion of weight pressed on the platform. The output voltage is very small, so the output voltage must be amplified and sent to the microcontroller.

For the effluent system Servo Motor Controlled Beam to press the discharge valve one way. Let the water be left to return to its original position when the water is released. Operation of servo motors using the microcontroller to change the direction of movement to 0 degrees. To force the rod to move down, press the button to open the water only. To discharge the water and the angle of 20 degrees to the spring valve to release the water one way back to its original position. To be ready to work again. The position of the down beam to press the discharge valve one way.

Figure 2 Raingauge

2.3 Temperature, Humidity and Pressure Instrument

Temperature and humidity measurement with DHT11, probe has the ability to measure relative humidity of 20-90% RH with precision, 5% RH measuring accuracy 1 % 8 - bit display current consumption 0.5 - 2.5 mA (measured) at 3 to 5.5 VDC read the sample rate every 1 second. Measure the pressure using the BMP085 probe with high accuracy and low power consumption, the BMP085 is capable of measuring from 300 to 1,100 hPa. With a precision of 0.03 hPa, this breakout board is based on technology. piezo-resistive It can support 1.8 and 3.6 volt direct current. It is also designed to connect microcontrollers via the I2C bus.

Figure 3 Temperature, Humidity and Pressure Instrument

3 Results and Discussion

Automatics weather Instrument is included. The development and measurement of data logger, temperature and humidity measurement with DHT11, pressure with BMP085 and raingauge using techniques weighing with load cell. The WEMOS microcontroller is equipped with a converter for connecting to a 20-watt solar panel and a 20-ampere-size battery for use in the control and operation for use in pay and control as shown in Figure 4.

Figure 4 Automatics weather instrument

Figure 5 Automatics weather instrument in Cha-am district, Nakhon Si Thammarat.

The test was installed at community enterprises, rambutan manufacturers in Cha-am district, Nakhon Si Thammarat. The weather data for the period of 1 - 3 November, 2560 will be transmitted information

viewed through website https://thingspeak.com/channels/340430 as shown in Figure 6

4 Conclusions

This paper presents basic automatic weather instrument. The development and measurement of data logger, temperature and humidity measurement with DHT11, pressure with BMP085 and raingauge using techniques weighing with load cell. In addition, the instrument is able to send send the information that is available through the cell phone to a WiFi connection and send it to application Line, and measure the amount continuously, and using power supply by solar cell. Consequently this technique can be immediately used in measurement weather. Moreover, it is low cost, easy to use, and portable.

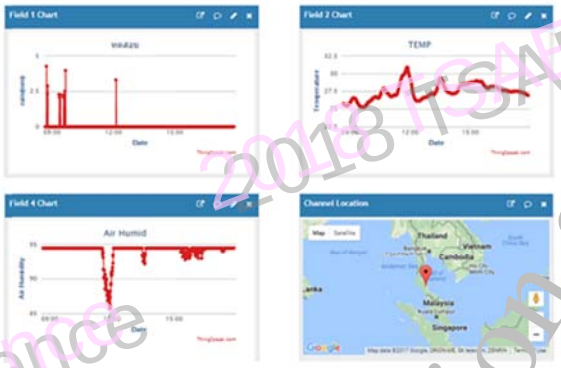

Figure 5 Information viewed through Website https://thingspeak.com/channels/340430

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