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DESIGN AND CONSTRUCTION OF:

a. Altimeter using mpx5100ap sensor:

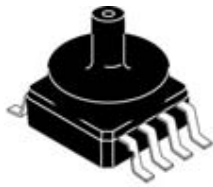


fig.i: shown mpx5100ap sensor

b. Wind speed and wind direction sensor using opto-coupler.

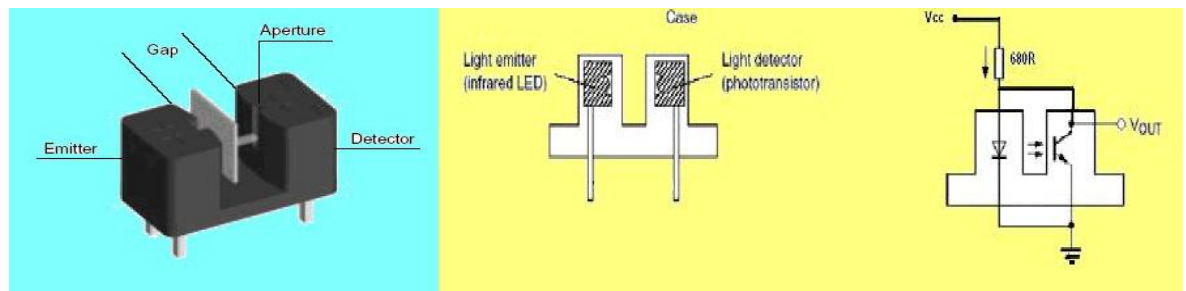


fig.ii: shown opto-coupler sensor

Design and development of a digital wind speed measuring device (cup anemometer). The instrument design consists of different electronics block stages: Power stage which supplies power through either a direct current (DC), input (sensor) stage which senses the number of revolutions per minute (rpm), the clock/triggering stage which was designed to monitor the time interval between the break and makeup of the pulses, and the output stage which comprises; the counting stage, decoders/memory stage and lastly the seven segment display.

- The materials used for designing wind speed are:
Aluminium and plastic for designing the body of the sensor, spindle for rotating the cups, light Alloy balancing the arms of the cups, plastic conical cups, bearing, Optocoupler U – shaped for motion detection, decoders/memory and lastly the seven segment display.

c. Precipitation measurement.

- The materials used for designing precipitation measurement are:

Perplex for designing the body of the sensor, Optocoupler U – shaped for motion detection.

Optocoupler is a device that consists of two parts: transmitter and receiver, which is between the light with the light source detection separately. Optocoupler is usually used as an electrical switch, which works automatically. Optocoupler is a component connector (coupling), which works based on optical light trigger.

d. **Global radiation sensor using photo-diode.**



fig.iii: shown phototransistor sensor

Photo-transistor sensor. A phototransistor is an electronic switching and current amplification component which relies on exposure to light to operate, it is capable of converting light energy into electric energy. When light falls on the junction, reverse current flows which is proportional to the luminance. Phototransistors are used extensively to detect light pulses and convert them into digital electrical signals. As with most regular transistors, a phototransistor operating range is also base-input dependent. This means that the transistors range of operation may be controlled by the intensity of the applied light.

e. **Relative humidity, Wet and dry bulb temperature sensors using RHT03 and Lm35:**



fig.iv: shown RHT03 and Lm35 sensor

The perplex and plastic container for designing the body of the sensor, potty, plastic pipe, electrical coupler and bolt and nuts.

The changes in physical properties of the main body temperature sensor is a core part of the temperature measuring instruments, and a wide variety. In accordance with the measurement method is divided into contact and non-contact two major categories, In accordance with the characteristics of sensor materials and electronic components into the thermal resistance and thermocouple. Used in this experiment is the LM35 temperature sensor. LM35 temperature sensor output voltage linear relationship between the Celsius temperature scale, for every 1°C increases in output voltage of 10mV. LM35 temperature sensor shows that the temperature is increased by 1 ° C, the output voltage increases 10MV. According to this principle procedures in real time reading out the analog voltage value of 0, since the analog port reads out a voltage value of 0 to 1023, i.e. 0V corresponding 0,5 V corresponds to 1023. Application, we only need to LM35 module, analog interface, the read analog value is converted to the actual temperature.

- **Summary**

The raw materials are locally available, accuracy is excellent and also the cost of the production is very low, cheap and affordable.

The raw materials are: MPX5100AP, RHT03, Lm35, Aluminium and plastic, spindle, light Alloy balancing the arms of the cups, plastic conical cups, bearing, Optocoupler U – shaped decoders/memory, display, photo-diode, cables, paint, sim900 or h900, A3LA-DG, operation amplifier lm358, ATMEGA1284P, etc.