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Intelligent Systems- Dust Control In Computers

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Abstract— The use of personal computers and laptops nowdays are huge , every now and then we require to to use such machines to make our work easier as a result its maintainence is also of a concerning issue. This paper describes about the dust control in such systems which we can implement to increase the system longeivity and hassle free performance.This particulate matter or environmental dust often intrudes our system and even we are aware of it we do not know the level of it when we need to control this, so there is need of a function which will make us aware about its exceeding level so that we can take measure against it at the earliest.

Keywords— Dust, sensor, aurdino

I. INTRODUCTION

First of all we need to know about what we call as environmental dust or simply dust. ItComes in the category of airborne contaminants dust is a collection of particles present in the environment , it may be from various sources such as soil, dust lifted by weather or what we know as an Aeolian process, volcanic eruptions and pollution.Being more specific dust in homes, offices, and other human environments contains small amounts of plant pollen human and animal hairs, textile fibers, paper fibers, minerals from outdoor soil, human skin cells, burnt metorite particles, and many other materials which may be found in the local environment.

This particles generally have an order between 0.001 to 1000 micrometer, like typical atmospheric dust is of approximately 0.001 to 30 micrometer, pollens range between 10 to 1000 micrometer , human hair between 40 to 600 micrometer etc.

Here are some examles given in the table below.

MATERIAL	SIZE
Beach Sand	100 – 10000
Mist	70 – 350
Fertilizer	10 – 1000
Pollens	10 – 1000
Cayenne Pepper	15 – 1000
Textile Fibers	10 – 1000
Fiberglass Insulation	1 – 1000

TABLE -1

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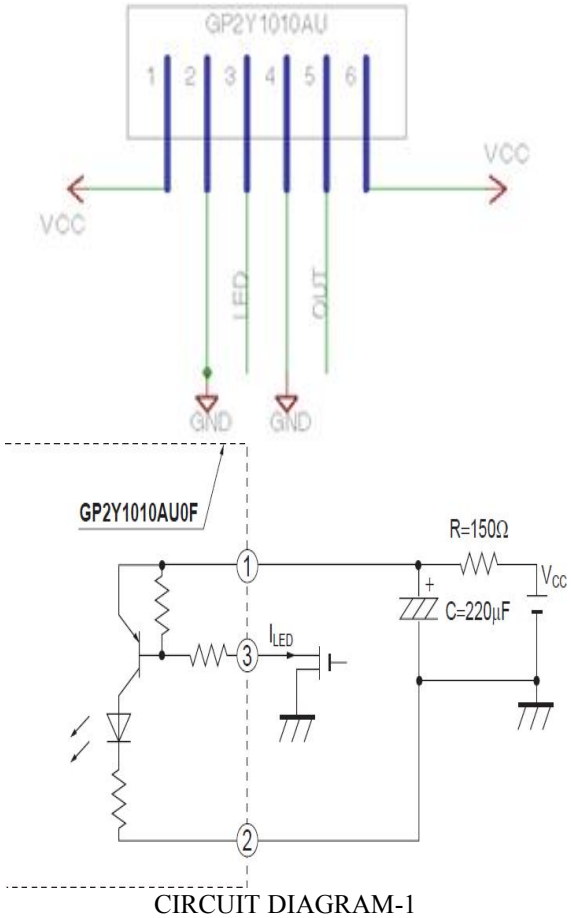
These are present around our system and often this creates a blockage in fans or presents a layer on the wafers which obstructs the clean running conditions of a system. So in order to mitigate this problems a theory can be designed.

II. PROPOSED THEORY

Our sensor is an optical air quality sensor, designed to sense dust particles. An infrared emitting diode and a phototransistor are diagonally arranged into this device, to allow it to detect the reflected light of dust in air. It is especially effective in detecting very fine particles like cigarette smoke, and can be used in detecting dust levels.

The sensor has a very low current consumption (20mA max, 11mA typical), and can be powered with up to 7VDC. The output of the sensor is an analog voltage proportional to the measured dust density, with a sensitivity of 0.5V/0.1mg/m3.All 6 pins on sensor need to be connected to Arduino:



CIRCUIT DIAGRAM-1

III. SPECIFICATIONS OF PIN

	Sensor Pin		Arduino Pin
1	Vled	–>	5V (150ohm resistor)
2	LED-GND	–>	GND
3	LED	–>	Digital pin 2
4	S-GND	–>	GND
5	Vo	–>	Analog pin 0
6	Vcc	–>	5V

The LED pin has to be modulated with a cycle of 1ms as discussed in the datasheet.
The LED seems to use a PNP transistor so to power on, the LED pin must actually recieve a lower voltage.

IV. INTERFACING WITH PERSONAL DEVICE:

AURDINO CODE :

```
int dustPin=0;
int dustVal=0;

int ledPower=2;
int delayTime=280;
int delayTime2=40;
float offTime=9680;
void setup(){
Serial.begin(9600);
pinMode(ledPower,OUTPUT);
pinMode(4, OUTPUT);
}

void loop(){
// ledPower is any digital pin on the
arduino connected to Pin 3 on the sensor
digitalWrite(ledPower,LOW); // power on
the LED
delayMicroseconds(delayTime);
dustVal=analogRead(dustPin); // read the
dust value via pin 5 on the sensor
delayMicroseconds(delayTime2);
digitalWrite(ledPower,HIGH); // turn the
LED off
delayMicroseconds(offTime);

delay(3000);
Serial.println(dustVal);
}
```

V.CONCLUSION

Devices we come across at present may use this theory to avoid unnecessary hurdles in performing smooth operations , this theory provided shows better results and an idea to conceive perfect usage as per user standards. This theory can be further exploited to have some immensely active and cutting edge results.

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