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AUTO-FUNCTIONAL DEVICE

Ruth.D. Kumar Rishabh Srivastava Rishabh Yadav Srikrishna Dubey

***Abstract*-The paper constitutes of studying the performance of Auto Functional device. Wherein we provided a device which could implement three functions in a time. The problems in small scale industry could be improved by the usage and implementation of this device other than these locations it could also be enabled in other sector which are prone to fire places. In this device we do not need it to be remote whereas it act as an obstacle avoider and finds its path accordingly. The usage of temperature Sensor provides us with the temperature of the room.**

***Key words*— Gas sensor, Microcontroller, Infrared sensor, Temperature sensor, Obstacle avoider**

I. INTRODUCTION

In this world of knowledge everything around us is run by Computing Systems. Due to various changes in technologies many systems have come up with breathtaking developments. The project is based in checking the sensibility of device. Here we computed the efficiently working of a device named AUTO-FUNCTIONAL device.

The Auto- Functional Device is basically a combination of various sensors that perform the set prescribed tasks. Here we used the combination of three sensors namely, Temperature sensor, Gas sensor and Infrared sensor. The temperature sensor provides us with the phenomenon rise or falls in temperature .whereas Gas sensor provides us with the alertness of smoke in a given room or place. In the end IR sensor provides us with the Path finder which further monitors the path and avoid the obstacles in the path.

II. OBJECTIVE

The objective of our project is to generate such a device with the mechanism of embedded technology and Sensors; which would provide us with various functions described below:

A. Gas sensor (MQ2)

This sensor detects the concentration of combustible gas in the air and output its reading as an analog voltage. It can detect LPG, I-butane, and methane, and alcohol, Hydrogen, smoke and so on. Sensitive material of MQ-2 gas sensor is Tin Di-Oxide SnO2, which has lower conductivity in clean air. Based on its fast response time, measurements can be taken as soon as possible. Also the sensitivity can be adjusted by the potentiometer or preset.

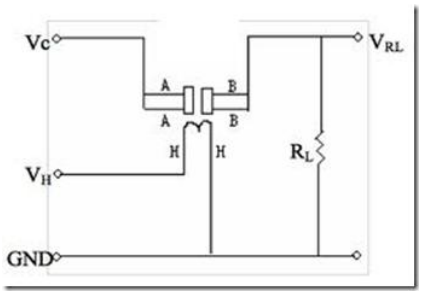

Figure 1: Diagrammatic view of Gas sensor

1)
2)

1).Hardware installation

MQ-2 has 6 pins, 4 of them are used to fetch signals, and other 2 are Heater coil used for providing heating current. We can use 5v DC or AC across H – H pins. The pin A (you can connect both pins A) is connected between the power and the ground. The pin B gets an analog voltage when the sensor is active. Before you connect the resistor use a potentiometer to tune and get accurate values. Generally RL value is between 10k and 200k. The Gas sensor detects the dust or smoke and accordingly the voltage in the negative terminal rises much higher than the positive terminal. The comparator IC 741 thereby produces the output and leads to switch off the LED. Thereby detecting the presence of smoke.

B. Temperature sensor (LM35)

The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature (in ^{o}C). The operating temperature range is from -55°C to 150°C. The output voltage varies by 10mV in response to every ^{o}C rise/fall in ambient temperature, i.e., its scale factor is 0.01V/ ^{o}C. It is a

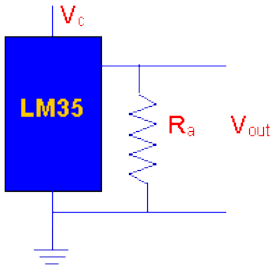

Fig 2: Temperature sensor LM35

3 pin IC constitutes of Output, Vcc, and GND. The o/p pin is connected to the A_o pin of AT mega 16, Vcc is supplied with the +5v supply and in the end the gnd terminal is connected.

C. *Infrared sensor*:

An infrared detector is a detector that reacts to infrared (IR) radiation. It constitutes of 3 pin IC Vout, Vin, GND. The input is provided with +5v supply whereas the output is connected to A_1 of the AT mega Microcontroller. This sensor is thereby used to provide the obstacle avoidance for the device.

A prescribed set value for the sensor is built in the device now, when ever any obstacle comes in between the device it reads the value generated and if it is less than that value it turns its direction, and when the value is greater than it comes on.

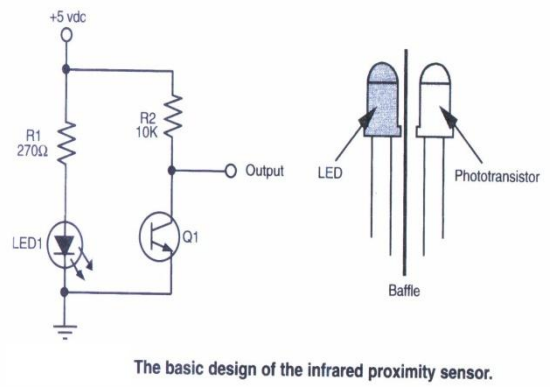

Fig 3: Infrared sensor view

III. MAIN RESULT

The focus of our Project named Auto –Functional Device is to build such a device which could demonstrate 3 functions at a single time period.

Now, a device works as follows:

The device when turned ON determines the temperature of the room directly in `C. the device moves in a room where it works as an obstacle avoider, The IR Sensor works to implement this feature in the device.

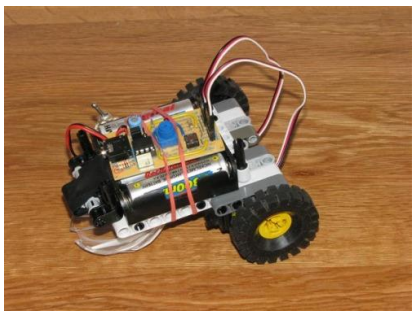

Fig 4: View of Auto Functional Device

A desired set value is built in the IR Sensor , whenever an obstacle comes in between the device the reading is obtained if it is lesser than the set value then the device identifies the presence of the obstacle and changes the direction , whereas if the value is greater it moves on the same direction.

And if any dust enters that area the smoke detector detects the smoke or dust particles and its output is shown by switching off the LED.

A. *Programming*:

```
#include <avr/io.h>
#include “lcd –lib.h”
#include <adc_lib.h>
#include <util/delay.h>
#include <stdio.h>

int x, y, temp;
char a [16];
int main (void)
{
LCD init ( );
LCD clr ( );
ADC init ( );
DDRB = 256;
while (1)
{
x = read_adc (0);
y = read_adc (1);
temp = y/2;
if (x<500)
{
Port D = 0b00000001
}
else
{
Port D = 0b00001010
}
LCD Goto x,y (0,0);
sprint(a,”temp = %d_%d”,temp ;x);
LCD display (a);
delayms(300);
}
}
```

IV. CONCLUSION AND FUTURE SCOPE

This device performs the function to automatically detect the obstacle in the path and thereby automatically changes its direction. It continuously monitors the temperature of the room and provides the reading in°C.The smoke sensor enabled in it administers the dust and gas in the room and alarms the user about the same.

This device is a great boon to the industries which are either a small scale section society or having millions of people working under them. This device would provide help to detect any fire or smoke in the

industry, and on the contemporary it can find the directions on its own. No such case of having being monitored continuously or remote control.

This device is also helpful in space-craft research where device like this is sending on other planets (e.g. Mars) to detect life on it.

Fig 5: View of Space craft send on Mars

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AUTHOR'S PROFILE

RUTH DEEPTI KUMAR born on 27th july 1991.She is pursuing B.Tech in Electronics and Communication from Kanpur Institute of Technology, Kanpur Uttar Pradesh, India. from 2009 to 2013. She has completed her training session of four weeks from North Central Railways, Kanpur.

RISHABH SRIVASATAVA born on 30th march 1992.He is pursuing B.Tech in Electronics and Communication from Kanpur Institute of Technology, Kanpur Uttar Pradesh, India. From 2009 to 2013. He has completed his training session of four weeks from North Central Railways, Kanpur.

RISHABH YADAV born on 16th march 1992.He is pursuing B.Tech in Electronics and Communication from Kanpur Institute of Technology, Kanpur Uttar Pradesh, India. From 2009 to 2013. He has completed his training session of four weeks from North Central Railways, Kanpur.

SRIKRISHNA DUBEY Born on 01st October 1992.He is pursuing B.Tech in Electronics and Communication from Kanpur Institute of Technology, Kanpur, Uttar Pradesh, India. From 2009 to 2013. He has completed his training session of four weeks from North Central Railways, Kanpur.