





DTMF module version (RM0033) decodes DTMF signal either from an audio source or phone line to 4 bit binary, TTL (SV) level output. It also indicates output with LED. It can be used with microcontrollers develop various DTMF related applications like remote control, caller ID, Auto Dialer. This module can be easily be used in conjunction with any of the Robosapiens development boards and develop mobile operated robots and gadgets.

Highly accurate filter circuits are implemented to divide tone signals into high frequency and low frequency signals. Basically it is an 18 pin IC. The HT9170 series consist of band pass filters and two digital decoder circuits to convert a tone DTMF signal into some signal output. It has a built-in amplifier circuit to adjust the input signals. The pre-filter circuit may filter out the dialing tone of 350Hz to 400Hz signal, and then use the high-pass and low-pass filters to split into high and low frequency signals. When the HT9170 receives an effective tone (DTMF) signal. The DV pin goes high and tone code (DTMF) signal is transferred to its internal circuit for decoding after setting the OE pin goes high and the DTMF decodes will appear on pin D0-D3. A standard 3.579545MHz connected to X1 and X2 terminals implement the oscillatory function.

## 5. Wireless A/V Camera



Figure 6.1: Wireless A/V Camera

The Wireless A/V camera is a high band receiver with sensitivity +18dB, receive signal picture sound 0.9H/1.2H with high quality output. The RM0100 is a 2.4 GHz wireless camera that works at 15m baret. It may cause interference with other wireless equipment that operates at the same band. The camera transmitter with receiver is set suitable for monitoring robot ,children and elder, and widely used for that presentation, after hour surveillance, home security, shops , factories, security ;you can view the cameras on your TV or record directly to VCB. The wireless camera and receiver will provide a day and night monitoring solution with the convenience of wireless technology.

## 6. Four Wheel Robotic Platform



In 4 wheel robotic platform v 2.0 have contain two 300 rpm dc geared motor, four double screw mount tire v 2.0 and one small chassis.

## 7. AVR Controller Board



Figure 8.1

AVR Controller Board is a complete starter kit and development system for the AVR Atmega16/32/8535 microcontrollers from ATMEL ® Corporation. It is designed to give designers a quick start to develop code on the AVR.

AVR Development Board kit is based on our 40 pin development board which is compatible with many of the Atmel AVR microcontrollers. This kit is an easy and low cost way to get started with microcontrollers. Included on board is an Atmega16/32/8535 microcontroller, external crystal with supporting capacitors, AVCC filter parts, Power supply parts and more. The Controller used is an 8-bit microcontroller. The versatility of board helps us to avail Programmable 16KB of flash, 1KB of RAM and Accessible 24C x I2C EEPROM. The board has 32 I/O lines, one programmable full duplex USART, 4 PWM channels and 8 channel 10-bit ADC Converter. The board creates a perfect platform for operating dual 8-bit Timers each having separate pre-scalars and compare modes. Additionally, a single 16-bit timer with a separate pre-scalar, compare and capture mode can be used. The Atmega16/32 is a feature packed and very versatile microcontroller. The board takes Input which can be either Analog or Digital in nature. On board we have PIN extensions of all the parallel I/O line available with the micro controller to make the peripherals plug n play.

Two L293D ICs are also available in Atmega-16/32 development board to run 4 different motors simultaneously. There is 1 DB-9 female connector also mounted on board for PC connection. There is one 16 pins LCD connector (female) also available. There are four PWM channels also available by which we can control stepper/servo motors. Master/Slave SPI serial interface availability make use of USBASP programmer to flash program in controller.8 keypad switch and pattern of 8 different led's are also available on Atmega-16 board. There are two different options to provide power

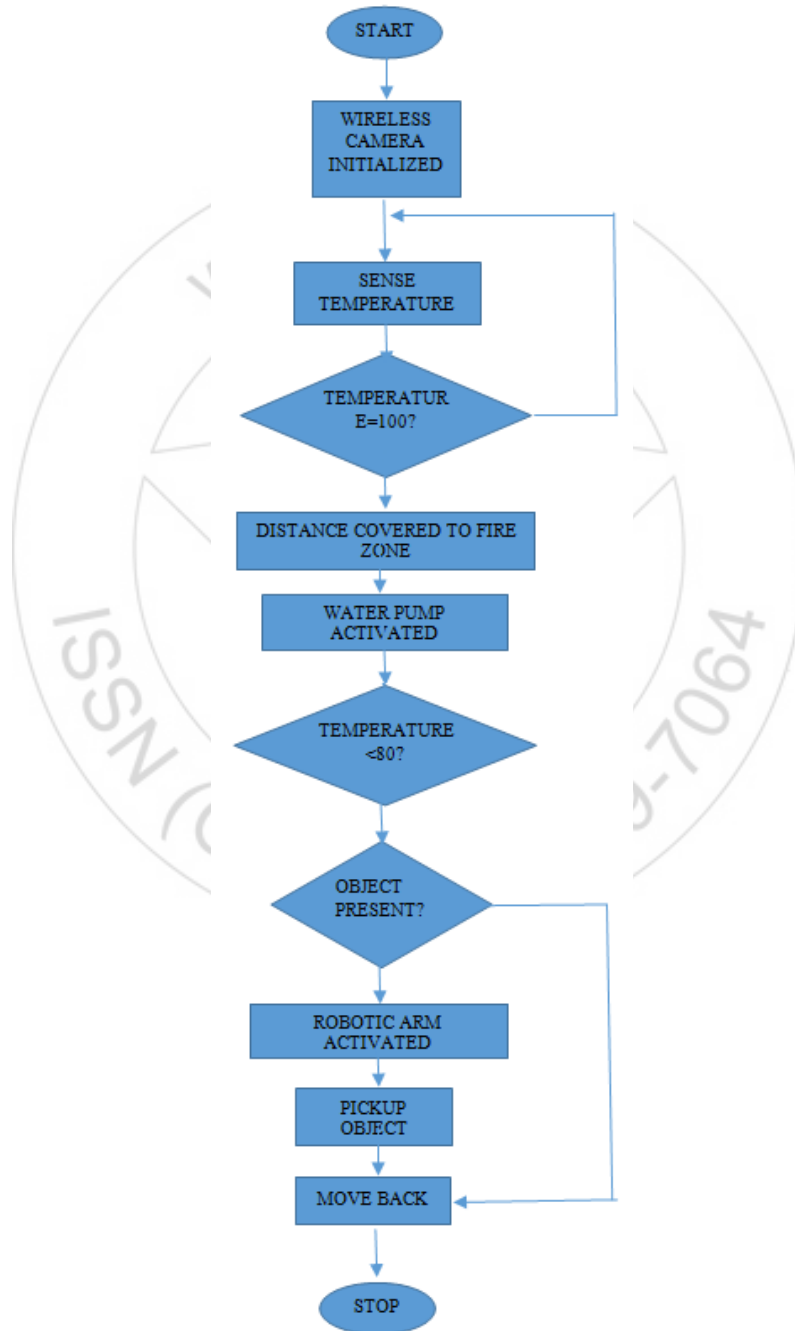
supply (DC battery/adapter) to the development board. It also has 4 Interrupt switches to create interrupts.

### 8. Program Code for LM35 Diode

```
int motor = 12;
int sensorPin = 0;
void setup()
{
}
void loop()
```

```
{
int reading = analogRead(sensorPin);
float voltage = reading * 5.0 / 1024;
float temperatureC = (voltage) * 100 ;
delay(1000);
if (temperatureC >= 100)
digitalWrite(motor,HIGH);
if(temperatureC<=80);
digitalWrite(motor,LOW); }
```

### 9. Flow Chart



## 11. LM35 Sensor

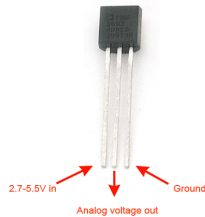


Figure 10.1

The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the users not required to subtract a large constant voltage from the output to obtain convenient Centigrade. The LM35 device does not require external calibration or trimming to provide typical accuracies of  $\pm\frac{1}{4}^{\circ}\text{C}$  at room temperature and  $\pm\frac{3}{4}^{\circ}\text{C}$  over a full  $-55^{\circ}\text{C}$  to  $150^{\circ}\text{C}$  temperature range. Lower in Still Air cost is assured by trimming and calibration at the  $\pm\frac{1}{4}^{\circ}\text{C}$  Typical wafer level. The low-output impedance, linear output,  $0.1\ \Omega$  for 1-mA Load and precise inherent calibration of the LM35 device makes interfacing to readout or control circuitry especially easy. The device is used with single power two Applications supplies, or with plus and minus supplies. As the device draws only  $60\ \mu\text{A}$  from the supply, it has very low self-heating of less than  $0.1^{\circ}\text{C}$  in still air. The LM35 device is rated to operate over a  $-55^{\circ}\text{C}$  to range  $-40^{\circ}\text{C}$  to  $110^{\circ}\text{C}$  range. The LM35-series devices are available packaged in hermetic TO transistor packages, while the LM35C, LM35CA, and LM35D devices are available in the plastic TO-92 transistor package. The LM35D device is available in an 8-lead surface-mount small-outline package and a plastic TO-220 package.

## 10. Future Prospective

1. Unmanned firefighting systems
2. Remote sensing and fire tracking
3. Automatic fire extinguishing systems
4. Unmanned ground rescue operations

## 11. Conclusion

Thus this project is a working state-of-art developing technology in the field of fire extinguishing, military, heat sensing, tracking, temperature analysis on a large scale value. A fully automated system with unmanned and wireless controls helps in saving time and human power and life at very efficient power scales.



## References

- [1] Robomart (<http://www.robomart.com>)
- [2] Robosapiens (<https://robosapi.com>)
- [3] 3.Electroncomponents (<http://www.electroncomponents.com>)
- [4] Frontiers in Robotics Automation and Control – Alexander Zemliak
- [5] Had workshop in Delhi from where I get the idea

## Authors Profile



**Shailendra Chauhan** is currently pursuing BTECH from Sikkim Manipal Institute of Technology (2012-16).



**Neel Rohit**, currently pursuing B.TECH from Sikkim Manipal Institute of Technology (2012-2016)