JOURNAL OF INFORMATION, KNOWLEDGE AND RESEARCH IN ELECTRONICS AND COMMUNICATION ENGINEERING
ISSN: 0975 – 6779| NOV 16 TO OCT 17 | VOLUME – 04, ISSUE – 02

PUBLIC GARDEN AUTOMATION SYSTEM

[1]Pawar P. M., [2]Pawar S. D., [3]Vare J. A.

Prof.T.M.Dudhane , Dept.of E & Tc,SCSCOE Dhangawdi.

Savitribai Phule University Pune,(India)

Abstract: The most important problems faced are the misusage of electricity and its wastage. Sometimes due tocarelessness of the authorities and the workers lamps are left ON which results in wastage of electricity.Water wastage is another problem which needs to be deal with Our project helps to overcome all these problems.In public garden automation system we are use various sensors to measure the moisture of soil and detect the temperature of surrounding or also LDR sensor for observe intensity of light.soil moisture sensor measure moisture in the soil we set a threshold value for moisture if it goes on that level of value then water pump will on automatically.

Keyword: Temperature sensor LM35,LDR,Moisture Sensor,microcontroller,Driver IC.

1.INTRODUCTION

This project will ripen and contrivance an automatic garden monitoring system that can be utilized to improve the condition of household gardens and can also be expanded to greenhouses.

Firstly the Microcontroller around 4.00pm switches on the water supply once to water the entire gardenfew hours before opening of the garden for public. Next the gate is opened by running the motor which isdriven by a motor driver operated by the Microcontroller. At around 6.00pm the lights are switched ondepending upon the output of the LDR and the lights remain functional till the garden remains open forvisitors.The garden remains open for about three hours and so around 8.50 pm a buzzer is sounded to indicateclosure of the garden and alert the visitors. The gate is then closed at 9.00pm and one of the two lampsis switched off. One lamp is kept on throughout the night. In the morning the remaining lamp is switchedoff depending upon the signal sent by the LDR, light dependent resistor to the Microcontroller. These are the step involved in the operation of the circuit and the public garden automation. Microcontroller is used to supervise the actions of all other devices and to control the entire set of operation.

2.PROJECT DESCRIPTION

The objective of this project is to develop and implement an automated garden monitoring system that can be scaled down to improve the conditions of indoor gardens as small as household garden boxes for garden enthusiasts or as big as greenhouses for the agriculture industry. Real time data will be collected by employing several analog sensors, such as light, temperature, humidity, and soil moisture sensors.

3.HARDWARE SPECIFICATIONS

- µC : PIC 18F4520
- Sensors :
  Temperature: LM35
  Soil MoistureL\ Electrode
- Patti S/w: Micro switch
- Load cell: 3Kg , 100ma
- Ultrasonic: HC04
- DC motor: 12v, 100ma, 2KG torque
- ADC: 10 Bit 13 channel
- LCD: 16*2 , 100 ma , Alphanumeric Display
- Relay: 12v , 230v ,Single change over
- Power Supply: 5V, 750 ma current.

4.BLOCK DIAGRAM

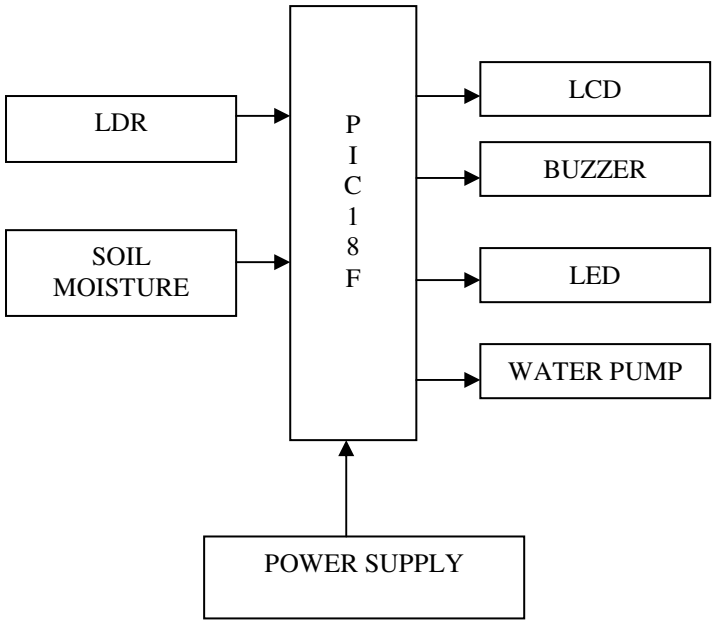


Figure (a)

5.BLOCK DIAGRAM DESCRIPTION

1.POWER SUPPLY UNIT: Power supply unit provides a 5V regulated supply to the micro controller PIC18F4520, ADC 0804, LCD, serial memory. It provides a 12V unregulated supply to the relays.

2. LDR: The output of LDR is given as input to the signal conditioning circuit the output of which is given to PIC18F4520 on input side to control the state of lamps.

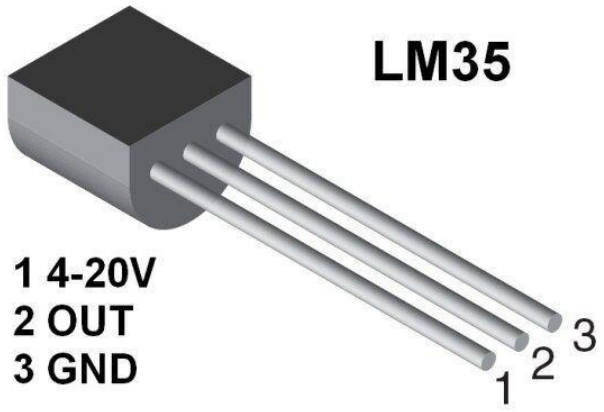
3. MICRO CONTROLLER PIC18F4520: It processes the calculated digital values by converting it to ASCII & sends it to the LCD display in order to display the data. Also depending upon the setting at the input, it controls the output

4. LIQUID CRYSTAL DISPLAY: As the name suggests, it is used for displaying purpose. It displays the current date, time.\

5 .SENSORS

TEMPERATURE SENSOR:

Temperature range is exceeded the certain range motor started and thatrange is upto 30°C.LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius(temperature). It has an advantage over linear temperature sensors calibrated in degree Kelvin, its output to obtain convenient Centigrade scaling. It is rated to operate over a -55° to +150°C temperature range.



FLOAT SENSOR:

Is typically used to measure the depth/level of liquid in a container. As the water rises and reaches the level of the float switch, it begins to float going from the vertical to the horizontal.

When the float sensor values exceed the set point and the microcontroller continuously scans for the float and float sensor will sense the particular parameter, and these parameters are in millivolts(0-1v), than ADC converts these parameters i.e analog voltage (given by the float sensor) it uses the technique of successive approximation (8bit) into digital hex format. This digital signal is then given to Microcontroller. The µc then receives the signal and converts it into corresponding BCD format (binary coded decimal) which is then displayed on the LCD (liquid crystal display).

LIGHT SENSOR LDR:

Photo resistors or Light Dependent Resistors (LDR) which change resistance according to light intensity. Normally the resistance of Photo resistor (LDR) decreases with increasing intensity of light falling on it.

Photomultiplier tubes containing a photocathode which emits electrons when illuminated, the electrons are then amplified by a chain of dynodes.

MOISTURE SENSOR: Electrodes

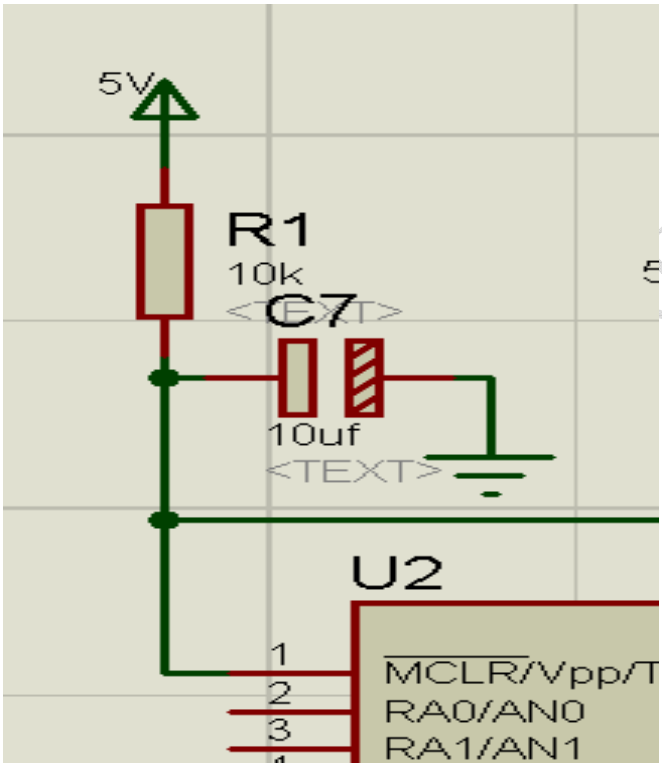
Here we are connecting a moisture based Electrode sensor. As soon as the water dries up then the electrode voltage rises to 5v which is applied to the non inverting terminal and the output of the amplifier is 0v which will in turn, turn on the AC motor.Soil moisture sensors measure the water content in soil. A soil moisture probe is made up of multiple soil moisture sensors. Since analytical measurement of free soil moisture requires removing a sample and drying it to extract moisture, soil moisture sensors measure some other property, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for moisture content. The relation between the measured property and soil moisture must be calibrated and may vary depending on soil type.
When the water level is up then the electrode voltage drops to 0v which is applied to the non inverting terminal and the output of the amplifier is 5v which will in turn, turn off the AC motor.

6 .PIC 18f 4520

- Clock frequency as high as 40 Mhz Project: 11.0592Mhz (For baud rate 9600)

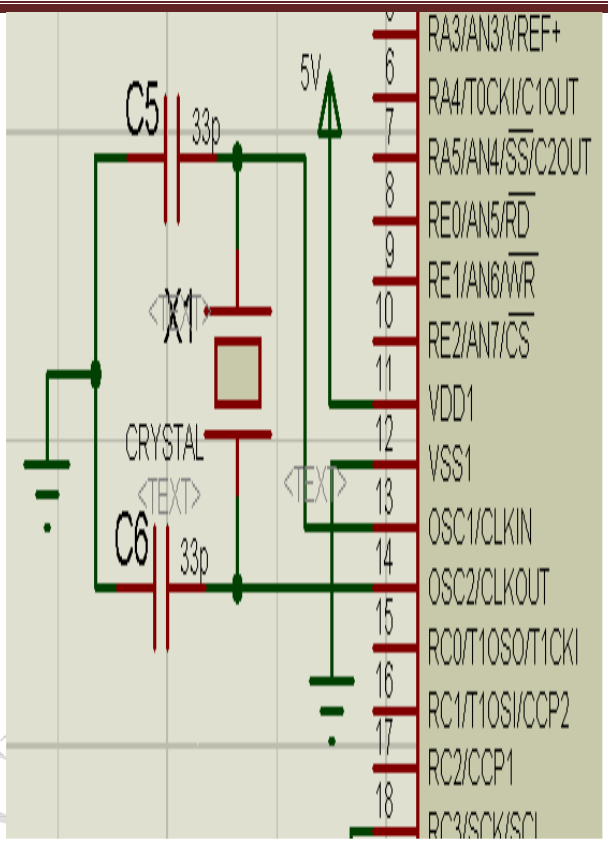
- Inbuilt ADC 10 bit 13 channels. Project: licappable yes 1 channel (Acc sensor)
- 1 Uart port pin 25 (Tx) pin 26(Rx) Project: NA
- 33 I/O ports (Including ADC)
- Memory:
  RAM: 1536 Bytes (1.5 KB)
  ROM: 32KB
  EEPROM: 256 Bytes
  Project: 50 to 100 bytes
- External Interrupts (RB0 and RB3) (Pin 33 and Pin 36)
  Project: RFID
- I2C inbuilt Project: NA
- SPI inbuilt Project: NA

- Reset circuit:



Recommended 1 msec to 100 msec
Project: 10KΩ * 10 µf → 100 msec

- Crystal



The crystal is connected to OSC1 (Pin 13) and OSC2 (Pin 14) Here we can use 12Mhz (When not using Uart0) Or 11.0592 Mhz (When using UART to get exact baud rate) C5 and C6 are used for noise removal To get exact square wave.

7.ADVANTAGES

- Effective way for attaining (Project application)
- High precision
- High degree of automation
- Cost-effective
- User friendly GUI (Android GUI)
- Easy to Use

8.DIS-ADVANTAGES

- Initial cost High
- Regular maintenance required

9.APPLICATIONS

- This small scale project can be implemented in any public garden with minimum cost and resources.

- This helps in proper utilization of the available resources and helps in avoiding wastage of electricity and water.

10.FUTURE SCOPE

This system can also be used for the betterment of farmers by including the some more sensors which work over quality of soil and nutrients present in soil. friendly.

11. CONCLUSION

This system will reduce the human efforts in gardening and also make the gardening automated and tech friendly.

It also makes the appropriate use of water resource which will help us to fight with the water scarcity problem and it also improve the health and life of plants.

12.REFRENCES

- http://www.alibaba.com/showroom/motor-controller-ics.html
- http://www.microchip.com/wwwproducts/Devices.aspx?dDocName=en010297
- http://ww1.microchip.com/downloads/en/devicedoc/39631e.pdf
- www.surplustraders.net/a/0082.shtml
- www.alldatasheet.com/datasheet.../G5NB-1A-12VDC.html
- datasheetreference.com/lm35-datasheet.html
- www.datasheetdir.com/LM35+Temperature-Sensors
- Venkata Naga Rohit Gunturi, “Micro Controller Based Automatic Plant Irrigation System”, International Journal of Advancement in Research and Technology, 2013.