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AUTOMATIC IRRIGATION CONTROL SYSTEM

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Abstract: In the field of agriculture, use of proper method of irrigation is important and it is well known that irrigation by drip is very economical and efficient. But for drip irrigation power is must with out power we can not do anything .Today is load shading is main problem to farmer .So to get status of all parameter i.e. water level of river water pump position etc is must to know to farmer. The project makes the irrigation automated. With the use of low cost sensors and SMS technology and the simple circuitry makes these projects a low cost product, which can be bought even by a poor farmer. This project is best suited for places where water is scares and has to be used in limited quantity. Also, third world countries can afford this simple and low cost solution for irrigation and obtain good yield on Crops. The heart of the project is the Intel 89c51microcontroller.UART controller that will be used in this project. A 16×2 LCD is connected to the microcontroller, which displays the various statuses.GSM modem to communicate farmer and his farm status using sms. . One relay is used to shut-off the main motor which is used to pump the water to the field.

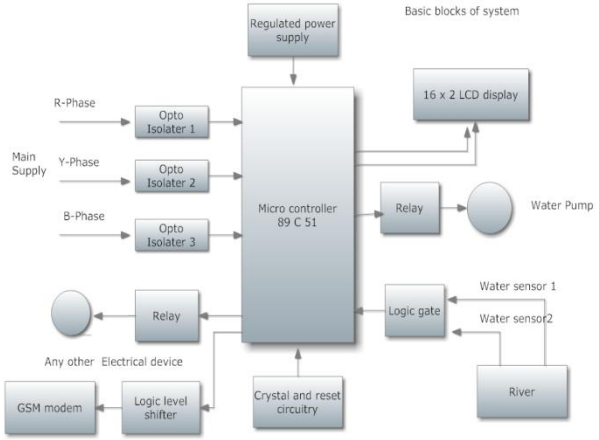
I. INTRODUCTION

The continuous increasing demand of the food requires the rapid improvement in food production technology. In a country like India, where the economy is mainly based on agriculture and the climatic condition is are isotropic, still we are not able to make full use of agricultural resources. The main reason is the lack of rains & scarcity of land reservoir water. The continuous extraction of water from earth is reducing the water level due to which lot of land is coming slowly in the zones of un-irrigated land.

Another very important reason of this is due to unplanned use of water due to which a significant amount of water goes waste. In the modern drip irrigation systems, the most significant advantage is that water is supplied near the root zone of the plants drip by drip due to which a large quantity of water is saved. At the present era, the farmers have been using irrigation technique in India through the manual control in which the farmers irrigate the land at the regular intervals.

This process sometimes consumes more water or sometimes the water reaches late due to which the crops get dried. Water deficiency can be detrimental to plants before visible wilting occurs. Slowed growth rate, lighter weight fruit follows slight water deficiency. This problem can be perfectly rectified if we use automatic micro controller based drip irrigation system in which the irrigation will take place only when there will be intense requirement of water.

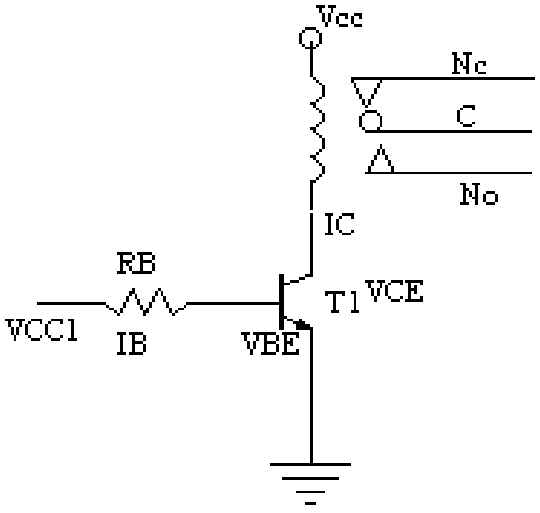
II. BLOCK DIAGRAM



Description of block diagram:
Shows basic block dig of our project irrigation control system sms this project consist of following main block:-
Opto isolator
Microcontroller
16x2 LCD display
Relay
Water pump
Logic level shifter
GSM modem
Crystal and reset circuitry
Regulated power supply
Opt isolator:
To make electrical isolation between RYB phase and microcontroller we use this opto isolater.At input of RYB phase is 120v AC to detect this phase is present or not we have to continually check it by microcontroller .For our project we use MCT2E Ic as opto isolator. Another opt isolator in market is 1: 1 transformer but it is bulky and costly
Micro Controller Unit:
For our project we select MCS 51 family compatible micro controller IC 89s52 this IC has following further:
1) Completely compatible to 8051 family in hard ware and software
2) On chip 8K flash programmable EEPROM
3) On chip crystal oscillator circuit
4) TXD, RXD line for data transmission and reception
5) Operated at +3 to +5 volt D.C. supply
6) 1k byte of internal RAM.
All above future is not seen any new controller Also 89s52 controller support higher level language just like Embedded C and number of free C compiler is available for this on
16X2 LCD display:
In our project to show various statues, we use 16x2 LCD alphanumeric displays with backlight. The advantages of this

are that we write 32 characters on it and due to backlight we can see it from long distance also. This display has 8 data line and three control line through which micro controller write character on it .The interfacing for display is given in book "8051 micro controller programming " by kneth J. ayala

Relay:
To turn on/off water pump we required automatic switch. Relay act as switch to connect or disconnect phase to it .This relay is 12 volt operated electromagnetic type and it required transistor to drive it



power supply

Water pump:
In our project to show the demonstration of water pump on/off we use 6v operated D.C. motor which is connected to relay

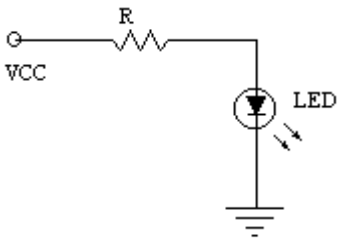
GSM Modem:
For sms sending purpose we use GSM decoder just like in Mobile handset which is connected to courier control circuit in courier Office. We will describe here of how to use an AT command on mobile decoders to be as a GSM communication information node NET just like keil, bescom etc .

Logic level shifter:
AS output of decoder is +12volt to logic 1 and -12 volt for logic 0 where as microcontroller logic 1 level is +5 volt and 0 level is 0 v to shift this logic level we use logic level shifter Ic MAX 232 in our project which is connected between controller and GSM modem

Regulated Power Supply:
For our project we req. regulated power supply of +5v and 12v this supply can obtain using step down transformer fall wave voltage Rectifier, Filter condenser and voltage regulator IC 7805.

Crystal and Oscillator:
For internal operation of micro controller we req. to generate machine cycle for this purpose we use 12MHz crystal between pin XTAL1 and XTAL2

Selection for current limiting resistance for LED



Fig,LED

As o/p of micro controller is equal to supply voltage i.e +5v dc

If we directly connected LED to micro controller then very high current flowing through it because internal resistance of led is very small about 5 to 8 ohm so it is possibility to damage LED so we place current limiting resistance R in series with diode the value of this resistance is calculated from ohms low

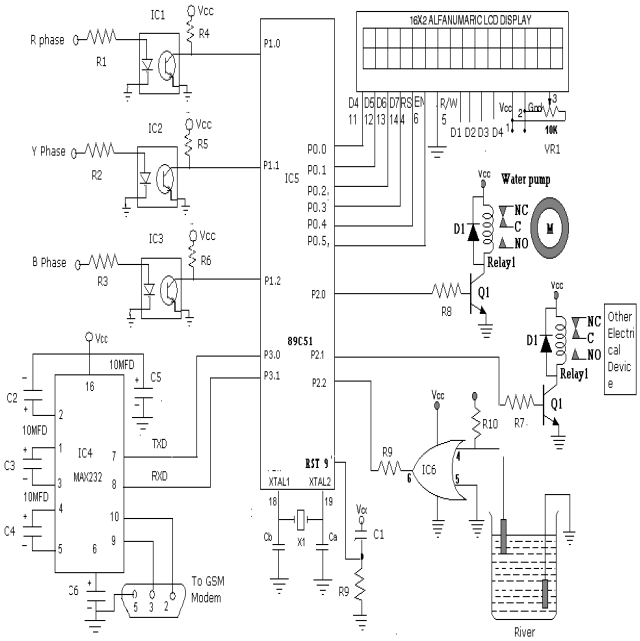
$V = R I$

Where
I= If safe forward current flowing through LED which normal intensity glow and this value near about 8 to 10 mA

$\therefore 5 = R \times 8mA$

$\therefore R = 625\ \Omega$

III. CIRCUIT DIAGRAM



IV. APPLICATION

In farm automation system
For domestic water pump on off
For industrial pump on off

V. ADVANTAGES

- Wit only 1 paisa SMS scheme farmer know status of farm on mobile in there house
- There is no need to go to farm for turning on/off water pump
- Water level of revere is also known by sending status SMS
- Are relatively simple to design and install
- This is very useful to all climatic conditions any it is economic friendly
- This makes increase in productivity and reduces water consumption

VI. DISADVANTAGES

1.Mobile tower range is needed to send and recived sms in case of no range sms is not received or send
2.At every SMS some balance is cut from mobile card
3.Equipment is costlier
4.Require frequent maintenance for efficient operation

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