MOOKAMBIKA TECHNICAL CAMPUS

MANNATHOOR P O., EATAPPILLY, MUVATTUPUZHA, ERNAKULAM.

Review-1

AUTOMATIC IRRIGATION SYSTEM

○ **Presented by :**

○ **Guided By :**

SREEJA . A/S8- ECE

MOOKAMBIKA TECHNICAL CAMPUS

Univ. Reg.No :12027060

Mail: srjdevu@gmail.com

AJAL A J

HOD - ECE dept.

School of Engineering

MOOKAMBIKA TECHNICAL CAMPUS

Mail: professorajal@gmail.com

CONTENTS

❖   **OBJECTIVE**

❖   **LITERATURE REVIEW**

❖   **BLOCK DIAGRAM**

❖   **COST ESTIMATION**

❖   **ENHANCEMENT**

❖   **SWOT ANALYSIS**

❖   **ACKNOWLEDGEMENT**

❖   **REFERENCE**

AUTOMATIC IRRIGATION SYSTEM

OBJECTIVE

➤ In today's world due to irrigation there might be some possible wastages. It may be water wastages, wastages of crops and so on...

➤In order to solve this issue we introduce an automatic irrigation system.

➤By using this system it will possibly reduce such wastages. So that better utilization of resources can be made possible.

➤It shows the basic switching mechanism of motor using sensors by sensing moisture present in the soil.

3

LITERATURE REVIEW

1. **"Microcontroller-based automatic Irrigation System with Moisture Sensor"**
   Abhinav Rajpal et.al, *International Conference of Science and Engineerig, 2011*

2. **"Water-Saving Irrigation System Based on Automatic Control by Using GSM Technology"** K S S Prasad et.al , *middle east journal of Scientific Research,* 2012.

3. **"Microcontroller based Controlled Irrigation System for Plantation"** S R Kumbhar et.al,

   IMECS , Vol II,2013

4. **"GSM based Automatic Irrigation Control System for Efficient Use of Resources and Crop Planning by using an Android Mobile"** Pavithra D S et.al ,*IOSR-JMCE* Vol II ,2014

1. **"Microcontroller-based automatic Irrigation System with Moisture Sensor"** Abhinav Rajpal et.al, *International Conference of Science and Engineerig, 2011*

➢ This paper proposed a microcontroller based automatic irrigation system which is a combination of harware and software that provides irrigation control

➢ The system should be easy to trouble shoot in the event of fault and it is also user friendly because it requires only eight keys for all the operation.

5

2. **"Water-Saving Irrigation System Based on Automatic Control by Using GSM Technology" K S S Prasad et.al , *middle-east journal of Scientific Research*, 2012.**

- Introduced an automatic irrigation system which will have a wireless sensor network for real-time sensing and control of an irrigation system by using GSM technology.
- It provides uniform and required level of water for the agricultural farm and avoids water wastage.

6

Contd….

➢ In this project we are interfacing ARM7 microcontroller through temperature sensor, humidity sensor and also interfacing to GSM through MAX232.

➢ The sensored values from different sensors send to the base stations which checks the condition for irrigation and performs automatic irrigation.

➢ Each field station are wirelessly communicates with base station by GSM technology.

7

3. "Microcontroller based Controlled Irrigation System for Plantation"
S R Kumbhar et.al, *IMECS* Vol II,2013

➢ Proposed a microcontroller based controlled remote irrigation system developed for the agricultural plantation, which is placed at the remote location and required water provides for plantation when the humidity of the soil goes below the set-point value.

➢ If the set-point value is high, then the motor is turned ON, otherwise the the motor is turned OFF.

8

Contd….

➤ This provides right amount of water at right time. The plants get water at the proper time then it helps to increase the production from 25% to 30%.

➤ This system can used to irrigate very large areas as it only needs to divide the whole land into number of sectors and the single micro--controller can control the whole process.

➤ It possible to correct the various parameters through the controller programming developed in assembly level language and necessary change in the action can be implemented in the software on the spot.

9

4. "GSM based Automatic Irrigation Control System for Efficient Use of Resources and Crop Planning by using an Android Mobile"

Pavithra D S et.al ,*IOSR-JMCE* Vol II ,2014

➢ Proposed an innovative GSM based/Bluetooth based remote controlled embedded system for irrigation to save the natural available resources.

➢ It sets the irrigation by continuously monitoring the status of the soil and temperature with the use of sensors, flow of water can be controlled by sending a message from our mobile.

10

Contd….

➢ It has an incorporate Bluetooth for remote monitoring which reduces the problem of range with GSM network and saves the SMS cost.

➢ The smoke sensors used to send emergency information to user incase of fire in field or burning of motor.

➢ This system avoid over irrigation, under irrigation, top soil erosion and the system action can be changed according to the situations(crops, weather condition, soil etc.)

11

BLOCK DIAGRAM

AUTOMATIC IRRIGATION SYSTEM

12
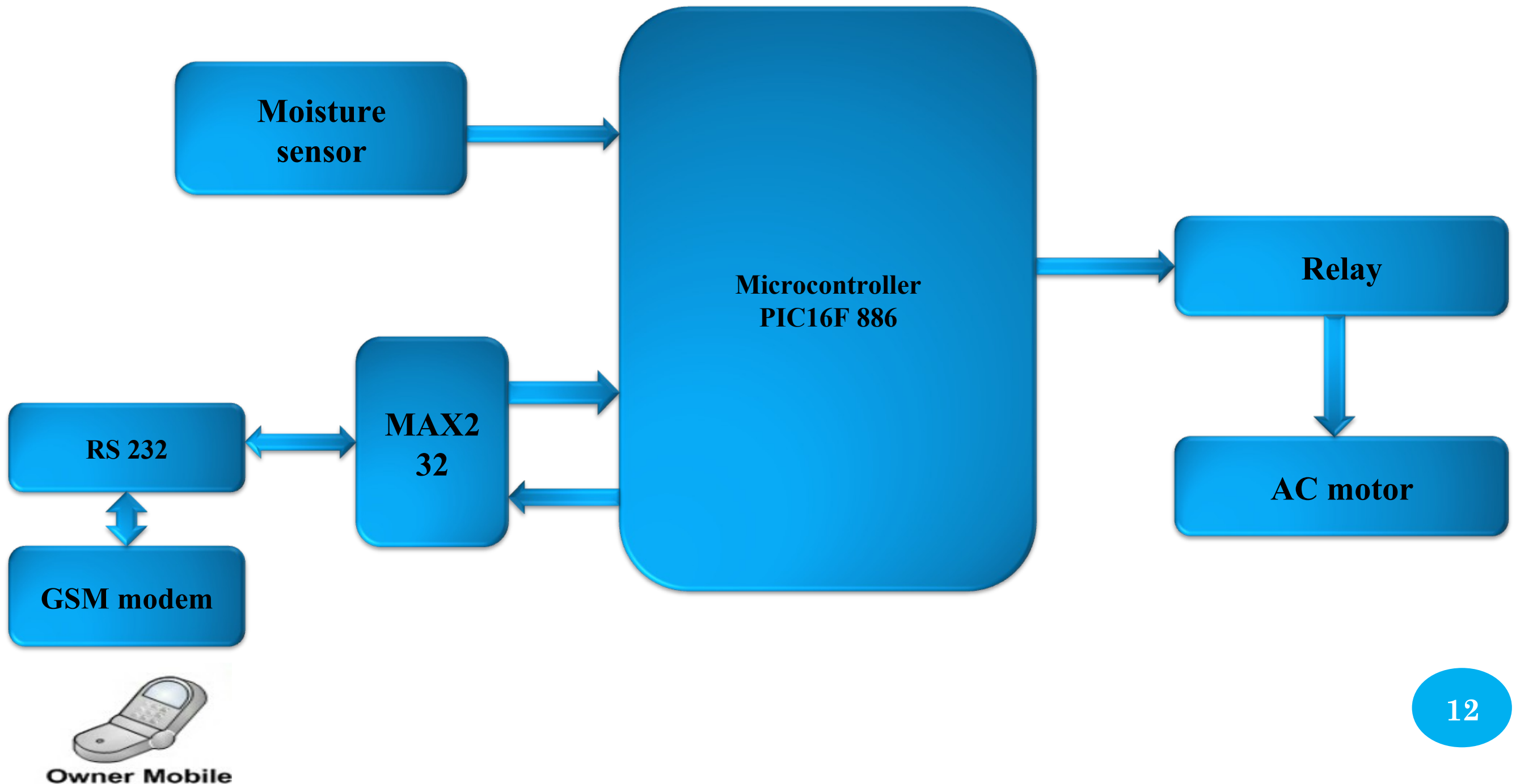
- **GSM Modem**

➢ The GSM modem is wireless modem that works with a GSM wireless

   network used for the control activities.

➢ It is an external PC card connected to the microcontroller by using UART.

➢ It requires a SIM card from a wireless carrier inorder to operate.

➢ It requires GSM and MAX232 interface through a logic level asynchronous

   serial port towards a microcontroller.

➢ It sends and receives data through radio waves.

AUTOMATIC IRRIGATION SYSTEM

- **Moisture Sensor**

➢ Used to measure the volumetric water content by using the dielectric constant, electric resistance properties of soil.

➢ It uses two probes, when inserted into the soil provides the repeated moisture readings used for the irrigation.

➢ More water makes the soil to conduct more easily (less resistance) while dry soil conducts poorly (more resistance)

14

• **Microcontroller**

➢ Microcontroller used is PIC16F886

➢ 8 bit controller

➢ Used for reading the values from the soil moisture sensor and controlling

the relay to the motor.

- **Relay**

  ➢ It is an electric switch that use an electromagnet to move the switch from OFF to ON position instead of a person moving the switch.

  ➢ Single pole double throw relay is used

- **AC Motor**

  ➢ An electric motor uses electric energy to produce mechanical energy.

  ➢ Electric motors are found in household appliances such as fans, pool pumps, refrigerator, washing machines etc

16

COST ESTIMATION

Sl.No	Components	cost
1	Moisture sensor	300
2	Microcontroller (PIC16F 886)	500
3	AC Motor	400
4	GSM Module	1500
5	SPDT Relay	400
6	others	400
Total		**3500**

ENHANCEMENT

➢ The proposed system "Automatic Irrigation System" basically depends on output of the moisture sensor. Whenever there is a need of excess water in the desired field.

➢ We will have to adopt the DTMF technology. By using this we will be able to irrigate the desired field and desired amount.

18

SWOT ANALYSIS

- **STRENGTH**

  ➢ Works according to the soil moisture condition.

  ➢ Complete elimination of manpower.

  ➢ Fully automated irrigation system which will turn ON and OFF a water pump as per the level of moisture in soil.

  ➢ Highly sensitive, low cost and reliable circuit.

  ➢ Can be handle heavy loads.

19

- **WEAKNESS**

  - This is applicable for only large frames.

  - Have limited life after installation due to the detoriation of the plastic component in a hot, arid climate when exposed to ultraviolet light.

- **THREATS**

  - New automatic systems are to be introduced to the market which may have better options.

  - cheap complementary products may enter to the market.

- **OPPORTUNITIES**

➢ There are huge opportunities in the local market since these types of automations are not yet penetrated to the villages and rural markets .

➢ Agriculture still uses conventional methods for many cases so that a huge opportunities are still awaiting in rural India.

21

ACKNOWLEDGEMENT

I am extremely grateful and remain indebted to our guide Mr. Ajal A J HOD of ECE dept. for being a source of inspiration and for his constant support. I am thankful to him for his constant constructive criticism and Invaluable suggestions.

I express my gratitude to Mr. Vineesh Mohan Asst. prof. ECE dept. for his constant official support encouragement and guidance for my project work.

I wish to express my sincere thanks to our Project coordinator Mr. Thomas for the competence ,guidelines and invaluable suggestions.

I do not like to miss the opportunity to acknowledge of all the faculty members for their kinds assistance and co-operations.

Last but not the least, thanks to my friends for their contributions.

22

REFERENCES

[1] Abhinav Rajpal, Sumit Jain, Nistha Khare and Anil Kumar Shukla "Microcontrolled -based Automatic Irrigation System with Moisture Sensor", *ICSE*, 2011

[2] K.Prathyusha1, M. Chaitanya Suman2, "Design of embedded systems for the automation of drip irrigation", *IJAIEM* Volume 1, Issue 2, October 2012

[3] K S S Prasad, Nitesh Kumar, Nitish Kumar Sinha and Palash Kumar Saha, "Water-saving Irrigation System based on Automatic Control by Using GSM Technology", *Middle-East Journal of science Research 12(12), IDOSI publiccations,*2012

23

[4] S R Kumbhar, Arjun P Ghatule "Microcontroller based Controlled Irrigation System for Plantation", *International MultiConference of Engineers and Computer Scientists* volume II, March 2013

[5] Pavithra D S, M S Srinath, "GSM based Automatic Irrigation control System for Efficient use of Resources and Crop Planning by Using an Android Mobile", *IOSTR Journal of mechanical and civil engineering*, volume II, July 2014

[6] Sonali D Gainwar, Dinesh V Rojatkar, "Soil Parameter Monitoring With Auto--matic Irrigation System", *International Journal of Science, Engineering and technology Research,* volume IV, Issue 11 , November 2015

24

Thank You!