IDENTIFICATION OF ABNORMALITIES IN POWER DISTRIBUTION AND MONITORING MODERN PRECISION AGRICULTURE

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***Abstract*- Agriculture plays the major role in economics and survival of people in India. Nowadays Indian agriculture faces a two major problem. They are as follows as; we know government has promoted a free supply of electricity for farmers to run their motors and pumps for irrigation purpose. But it is found that the farmers misusing the electricity to run their home appliances such as radio, TV, fans, etc. This misuse of electricity has brought a considerable problem for government to supply free electricity. Since most of the farmers have less knowledge about the nature of their soil and its fertility, they cannot find the right seeds for their fields to be sowed. To Avoid these problems a microcontroller based embedded system has been proposed in this project. This proposed system recognizes whether the free electricity has been used other than electric motors for pumping water and if so electricity is being misused, it shuts the total supply for the farmers through a tripping circuit. By using wireless networks we can intimate the electricity board about these mal practices. This system also helps the farmers to find their soil fertility.**

***Index Terms*- Power Supply, current transformer and voltage transformer, irrigation pump motors, electricity**

I. INTRODUCTION

Tamil Nadu government has allotted free electricity for the poor farmers. The farmers are due to their illiteracy and innocence use the allotted farm power for the domestic purpose. There by the free electricity for the farming is abused .To implement a system that would detect whether free electricity for farmers being misused and to send information to EB section if they misuse the power by running appliances other than irrigation pump motors

II. PROPOSEDD SYSTEM-BLOCK DIAGRAM

Main Section:

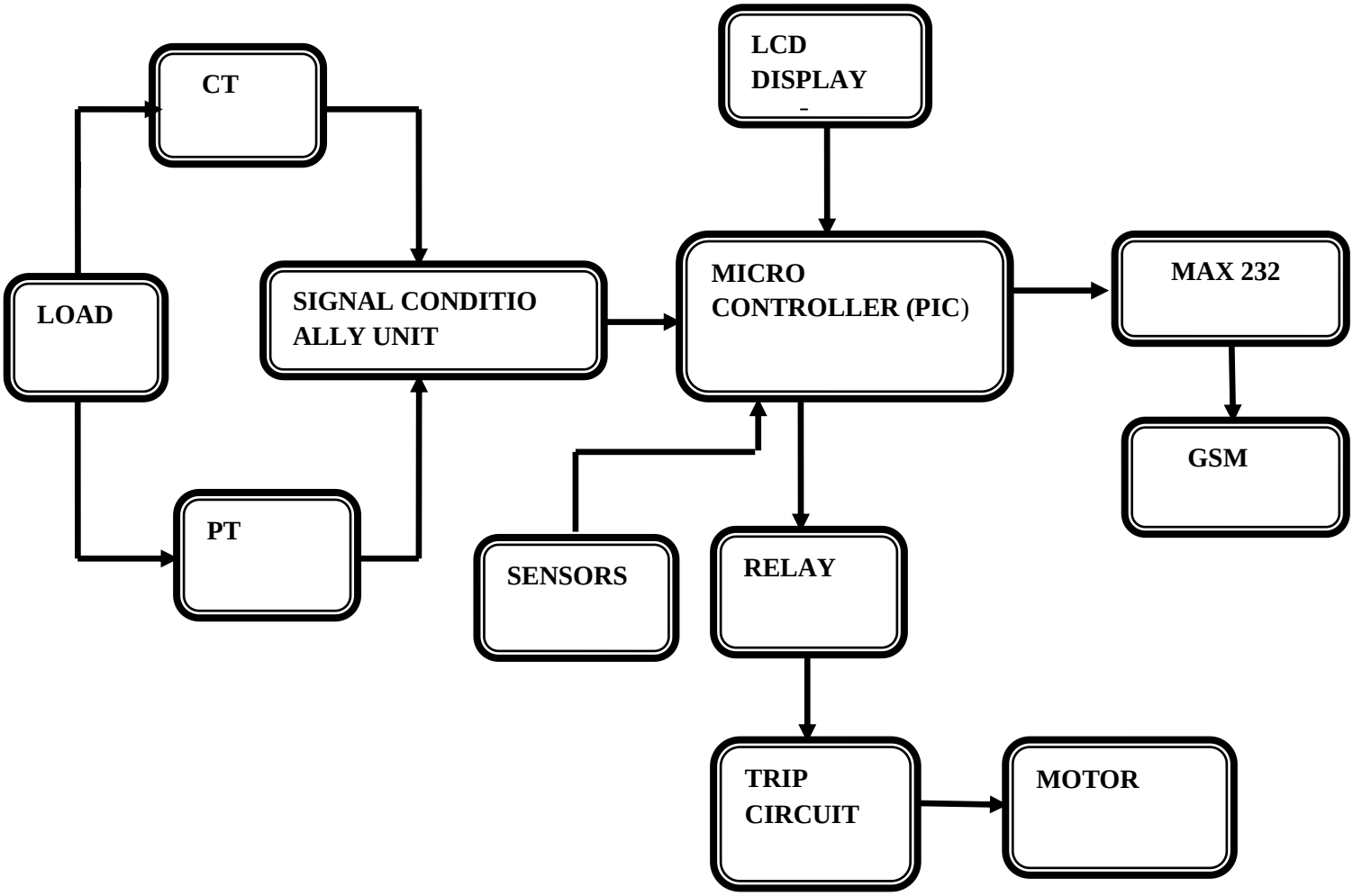

Figure: 1: Block diagram main section.

Current transformer is provided exact current flowing in distributed power line. Voltage transformer is provided voltage in that line. Signal conditioning unit is used give an equivalent voltage and current to the micro controller unit. If any current variation is found in distribution line which can be detected and informed to the EB section which will be communicated by ZigBee network given. Ph sensor is used to sense PH value to find soil fertility information is shown in fig 1&2.

EB Section:

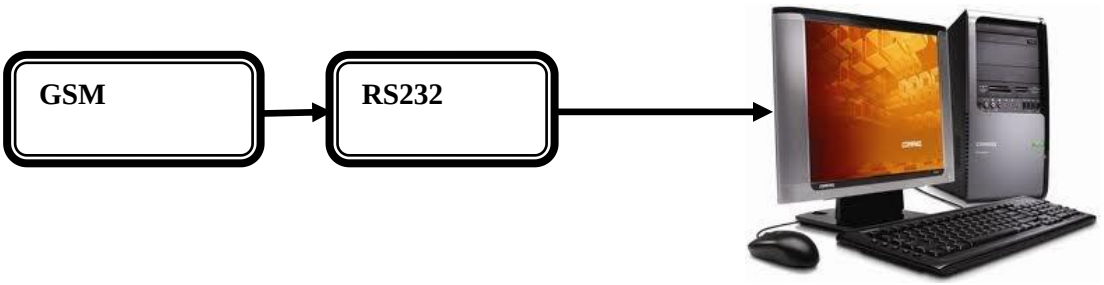

Figure: 2: Block diagram EB section.

CIRCUIT DIAGRAM:

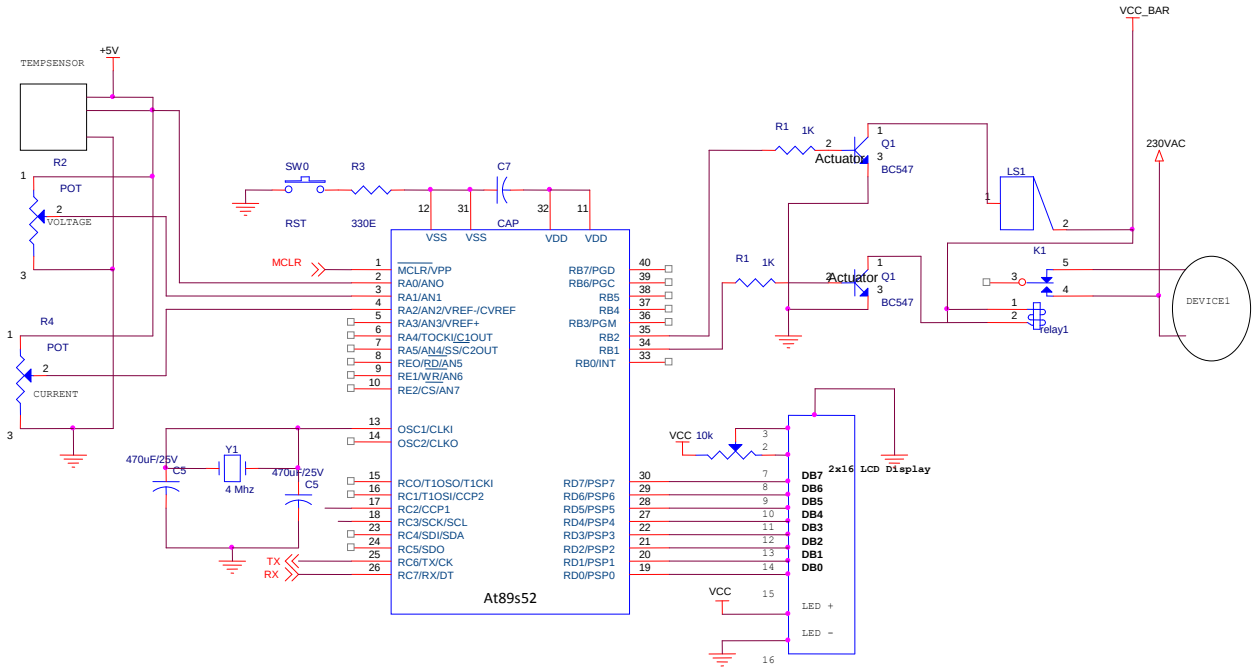

Fig 3:circuit diagram

In the circuit diagram we have given a load to the current transformer and voltage transformer. Here the current transformer and voltage transformer that provides the power line to the circuit it uses to provide the amplification then the signal is converted to dc by using a rectifier unit .the signal is sent to controller unit here a sensor(PH and humidity)is connected to controller and max232 is used to interface the GSM peripheral to the controller via the GSM the excess load is intimated to the EB section .relay is act as a switch here we using a trip

circuit it act as circuit breaker when the load excess. The sensor is used that whether the motor is running in wet or dry land to check that a LCD display is connected via RS232 shown in fig 3.

POWER SUPPLY UNIT

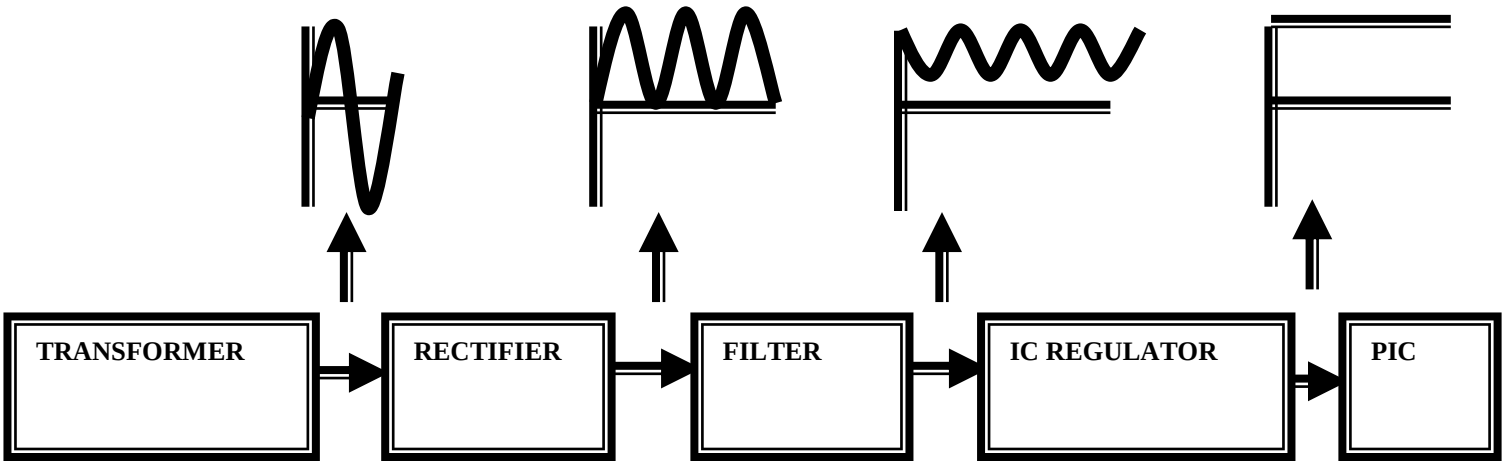

Fig.4. Block diagram of power supply

TRANSFORMER:

The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level. Then the secondary of the potential transformer will be connected to the precision rectifier, which is constructed with the help of op–amp. The advantages of using precision rectifier are it will give peak voltage output as DC, rest of the circuits will give only RMS.

BRIDGE RECTIFIER:

When four diodes are connected as shown in figure, the circuit is called as bridge rectifier. The input to the circuit is applied to the diagonally opposite corners of the network, and the output is taken from the remaining two corners.

Let us assume that the transformer is working properly and there is a positive potential, at point A and a negative potential at point B. the positive potential at point A will forward bias D3 and reverse bias D4. The negative potential at point B will forward bias D1 and reverse D2. At this time D3 and D1 are forward biased and will allow current flow to pass through them; D4 and D2 are reverse biased and will block current flow. The path for current flow is from point B through D1, up through RL, through D3, through the secondary of the transformer back to point B. this path is indicated by the solid arrows. Waveforms (1) and (2) can be observed across D1 and D3.One-half cycle later the polarity across the secondary of the transformer reverse, forward biasing D2 and D4 and reverse biasing D1 and D3. Current flow will now be from point A through D4, up through RL, through D2, through the secondary of T1, and back to point A. This path is indicated by the broken arrows. Waveforms (3) and (4) can be observed across D2 and D4. The current flow through RL is always in the same direction. In flowing through RL this current develops a voltage corresponding to that shown waveform (5). Since current flows through the load (RL) during both half cycles of the applied voltage, this bridge rectifier is a full-wave rectifier. This may be shown by assigning values to some of the components shown in views A and B. shown in fig 4. Assume that the same transformer is used in both circuits. The peak voltage developed between points X and y is 1000 volts in both circuits. In the conventional full-wave circuit in

view A, the peak voltage from the center tap to either X or Y is 500 volts.

Since only one diode can conduct at any instant, the maximum voltage that can be rectified at any instant is 500 volts. The maximum voltage that appears across the load resistor is nearly-but never exceeds-500 v0lts, as result of the small voltage drop across the diode. In the bridge rectifier shown in view B, the maximum voltage that can be rectified is the full secondary voltage, which is 1000 volts. Therefore, the peak output voltage across the load resistor is nearly 1000 volts. With both circuits using the same transformer, the bridge rectifier circuit produces a higher output voltage than the conventional full-wave rectifier circuit.

IC VOLTAGE REGULATORS:

Voltage regulators comprise a class of widely used ICs. Regulator IC units contain the circuitry for reference source, comparator amplifier, control device, and overload protection all in a single IC. IC units provide regulation of either a fixed positive voltage, a fixed negative voltage, or an adjustably set voltage. The regulators can be selected for operation with load currents from hundreds of milli amperes to tens of amperes, corresponding to power ratings from milli watts to tens of watts. A fixed three-terminal voltage regulator has an unregulated dc input voltage, Vi, applied to one input terminal, a regulated dc output voltage, Vo, from a second terminal, with the third terminal connected to ground. The series 78 regulators provide fixed positive regulated voltages from 5 to 24 volts. Similarly, the series 79 regulators provide fixed negative regulated voltages from 5 to 24 volts shown in fig 5.

CIRCUIT DIAGRAM :

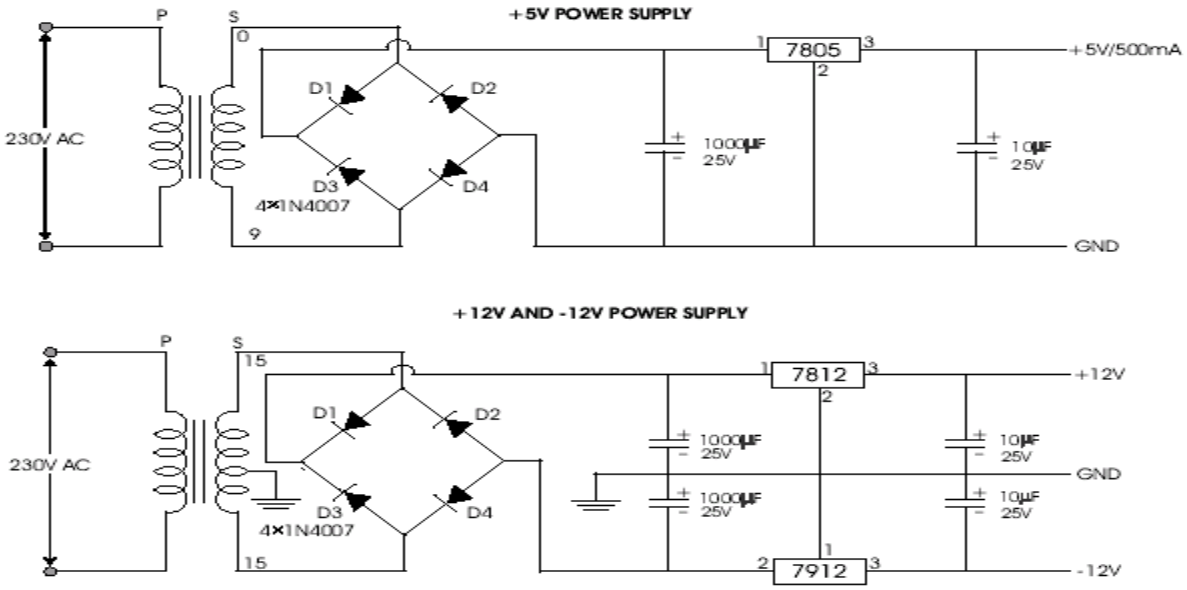

Fig.5 Circuit Diagram of Power Supply

The AC voltage, typically 220V rms, is connected to a transformer, which steps that ac voltage down to the level of the desired DC output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation. A regulator circuit removes the ripples and also remains

the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes.

III. CONCULSION

The proposal presented in this paper makes it possible to implement a security system for power theft in free distribution unit. It will be a easy way for farmers to identify soil fertility information.

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