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Online Energy consumption and automatic load switching using Arduino

Pushkar S. Kukawalkar [1], Amita B. Aachat [2],Prof. Sunil M. More[3]

[1,2,3] *Department Of Electrical Engineering*

Organization Name: Guru Gobind Singh Polytechnic, Nashik,Maharashtra (India)

ABSTRACT

Now a days in every industry, there are lots of machines as well as motors. To operate each machine, it is required separate operator, which is not efficient in such operations, lots of complication and problem appears. Our project is to make it easier and smooth in operation by using aurduino module we can easily access important parameters and calculation of energy consumption and by using wifi module we can control the grid remotely. Saving of energy is the biggest advantage of this project.

I.INTRODUCTION

Distribution transformer is an the electrical equipment in the power system is used to distribution the power directly to the low voltage used. The operating condition is important. In distribution network operation of distribution transformer guarantees their long life but it continuously introduce overloading, then loss of supply consumer happens thus reliability of the system reduce. Overloading and cooling system are the main causes of failure in distribution transformer. The existing monitoring system and device in many problems and deficiencies. In their operation for this project ARDUINO control is the heat of this system. Due to the wireless system by using feature of wifi module energy consumption becomes easier and it is send to mobile phone or p.c by using this system. Operator does not need to go the particular place for switching the grid and simultaneously indication will be displayed on 16*2 LCD display.

II.BLOCK DIAGRAM

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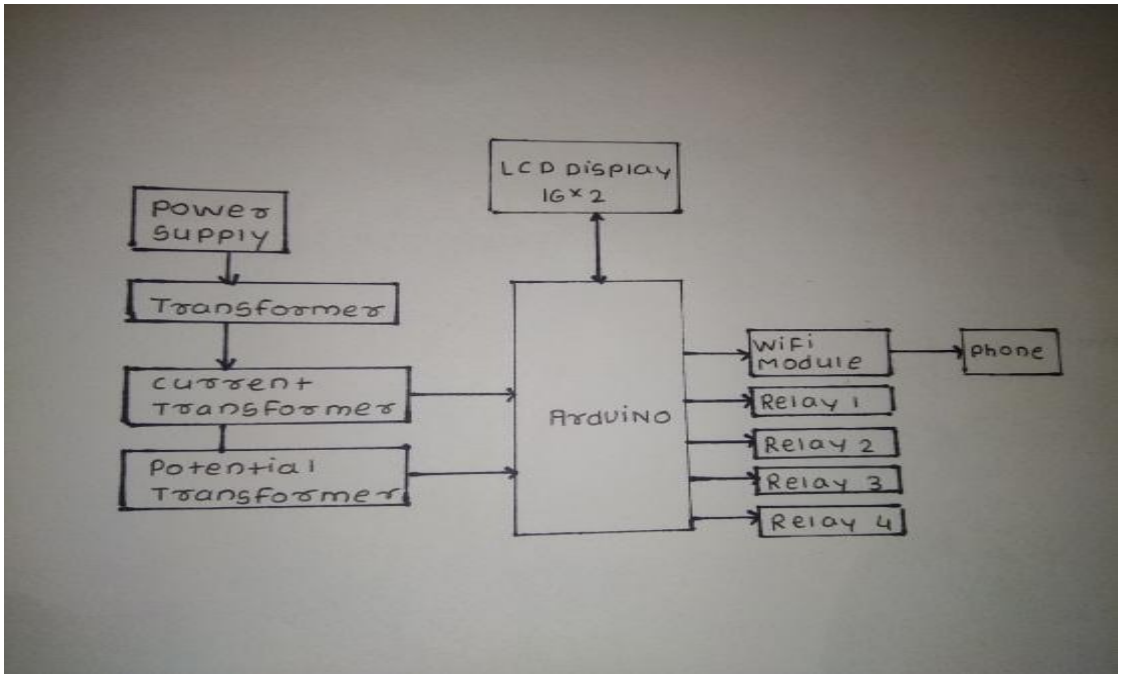
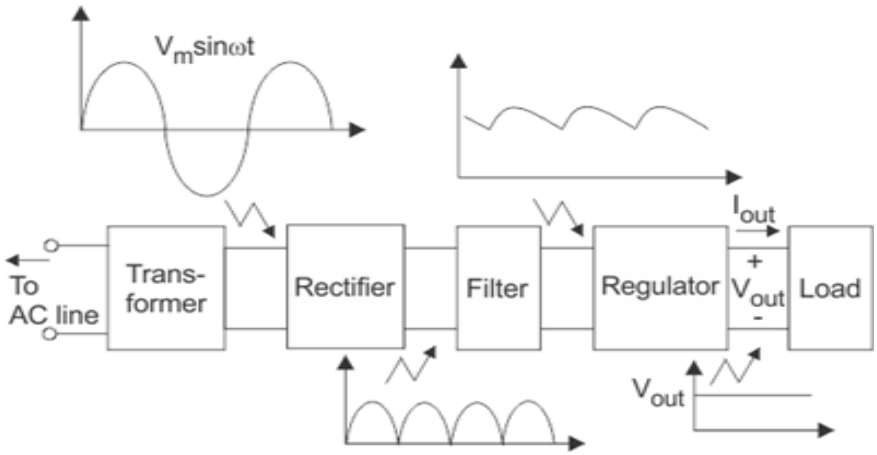


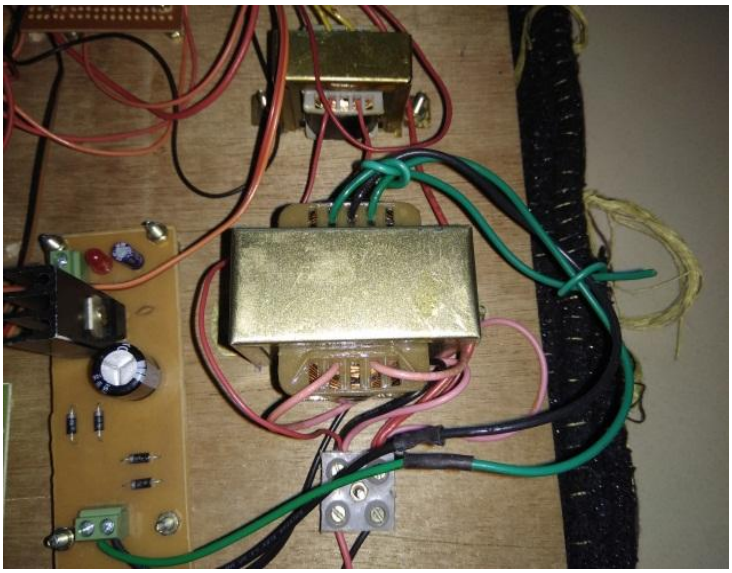
1. Fig. 1.0 block diagram

2.1POWER SUPPLY



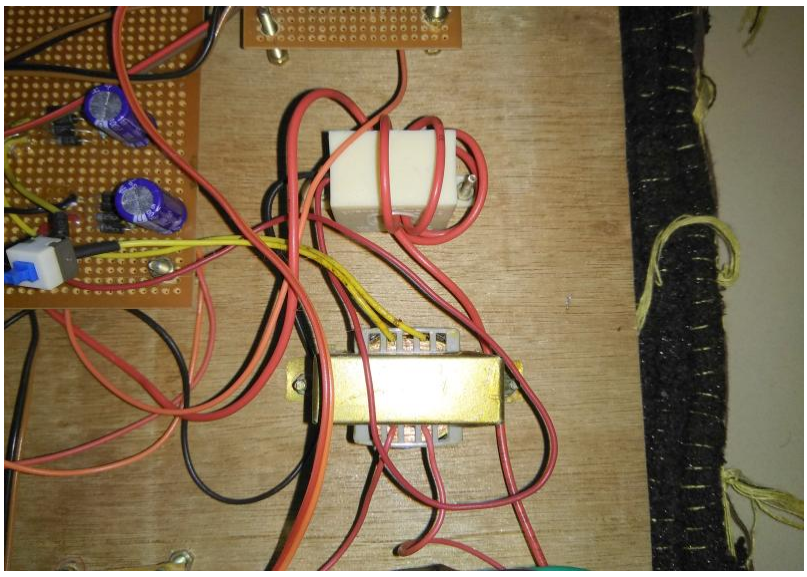
Generally power is generated, transmitted and distributed in the form of AC due to the economical condition. But most of the electronic and electrical devices require dc supply.Transformer is the devise which is used to step down the generated supply voltage as per the requirement of of equipment. Rectifier is used to convert AC supply into pulsating DC supply. Filters are extensively used for noise filtering and voltage regulator provides stable DC voltage.

2.2TRANSFORMER



The step down transformer is the one for that secondary voltage is less than prime voltage. It is used to reduce the voltage from primary winding to secondary. Winding as a step down unit, the transformer convert high voltage, low current power is to low voltage high current.

2.3CURRENT TRANSFORMER

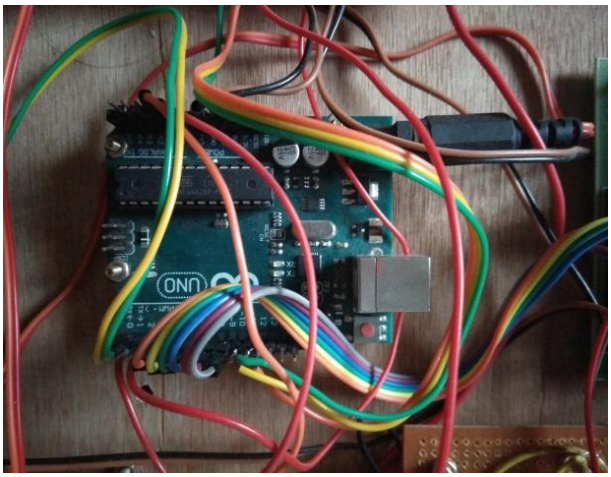


Current transformer is a device which is used for measurement of line current. It measures high current at potentially high voltage.

III.POTENTIAL TRANSFORMER

It is a device which is used is used for measurement of line voltage PTs step down high voltage to the voltage needed by the meter casually 120v (occasionally 67 v).

31ARDUINO

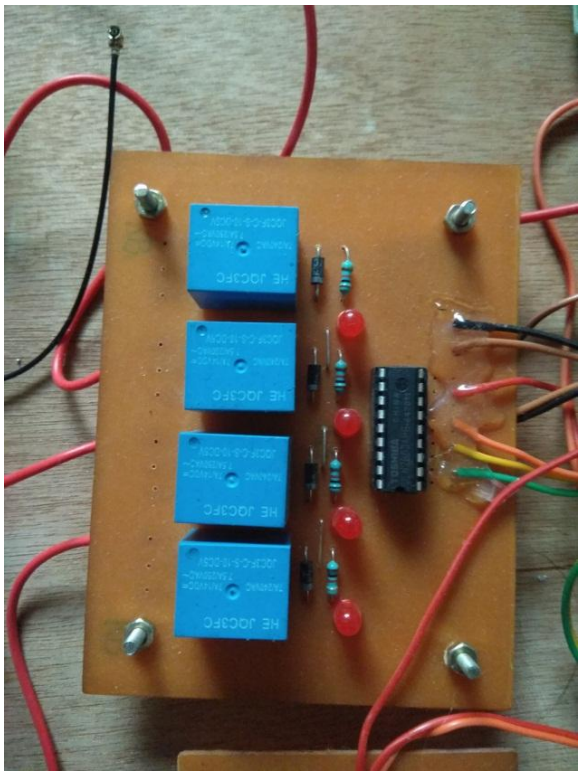


Arduino is a photo type platform based on easy-to-use hardware and software. It consists of circuit boards, which can be programmed and ready-made software called aurdino IDE (integrated development environment). It is used to write and upload the computer code to physical board

3.2WIFI MODULE

By using wifi module, it is more easier and simple to make a wireless network.Wifi technology is mostly used to connect the devices for various purpose like data sharing. It allows the remote access to the system.

3.3RELAY



It is a sensing device which used to sense the fault in the connected load. The SPDT relay is useful in certain application. It has a common terminal and 2 contact in 2 different configuration one can be NC and other one is opened or it can be no and the other can be closed.

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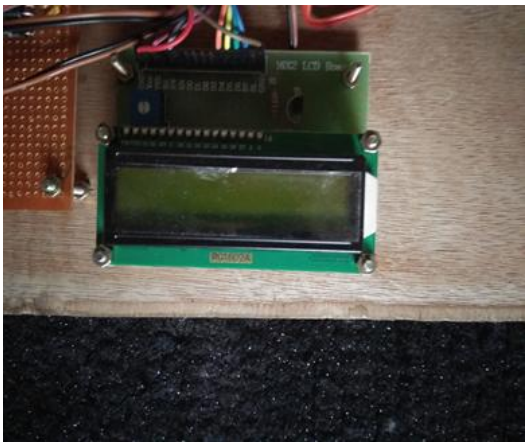
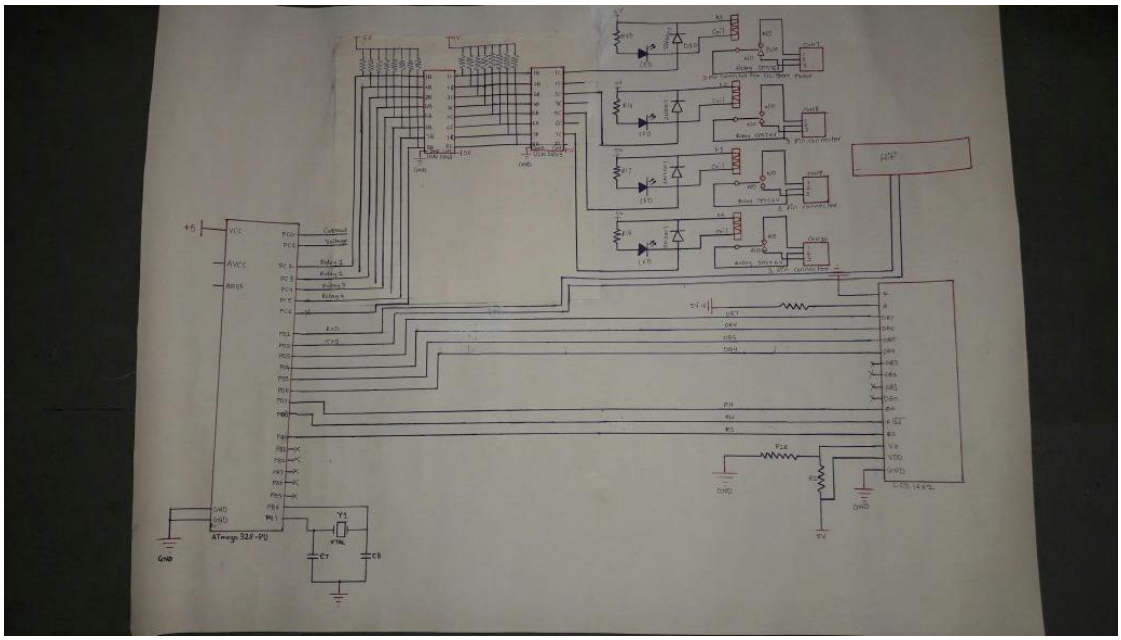
3.4LCD DISPLAY 16*2



LCD of two lines each with 16 characters i.e 16*2 other than 8 data line one RS, one RW, one enable line is required. The resistor R7 is used to set the intensity of back light all the instruction and parameters will be continuously displayed on the 16*2 LCD display.

IV.CIRCUIT DIAGRAM



Arduino is a Atml Pico power ATmega328 which is of low power (MOS 8bit micro controller). It is based on AVR enhanced RISC architecture. It require 5v DC supply

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First two pins that is PC0 and PC1 are go to current sensing and voltage sensing respectively. Then PC2, PC3,PC4,PC5 are go to IC (ULN2803) and go to four relay connected to it then PD0 and PD1 (RXD and TXD) go to WIFI module. Then pins (from PD2 to PB0) go to 16*2 LCD display.

V.FLOWCHART

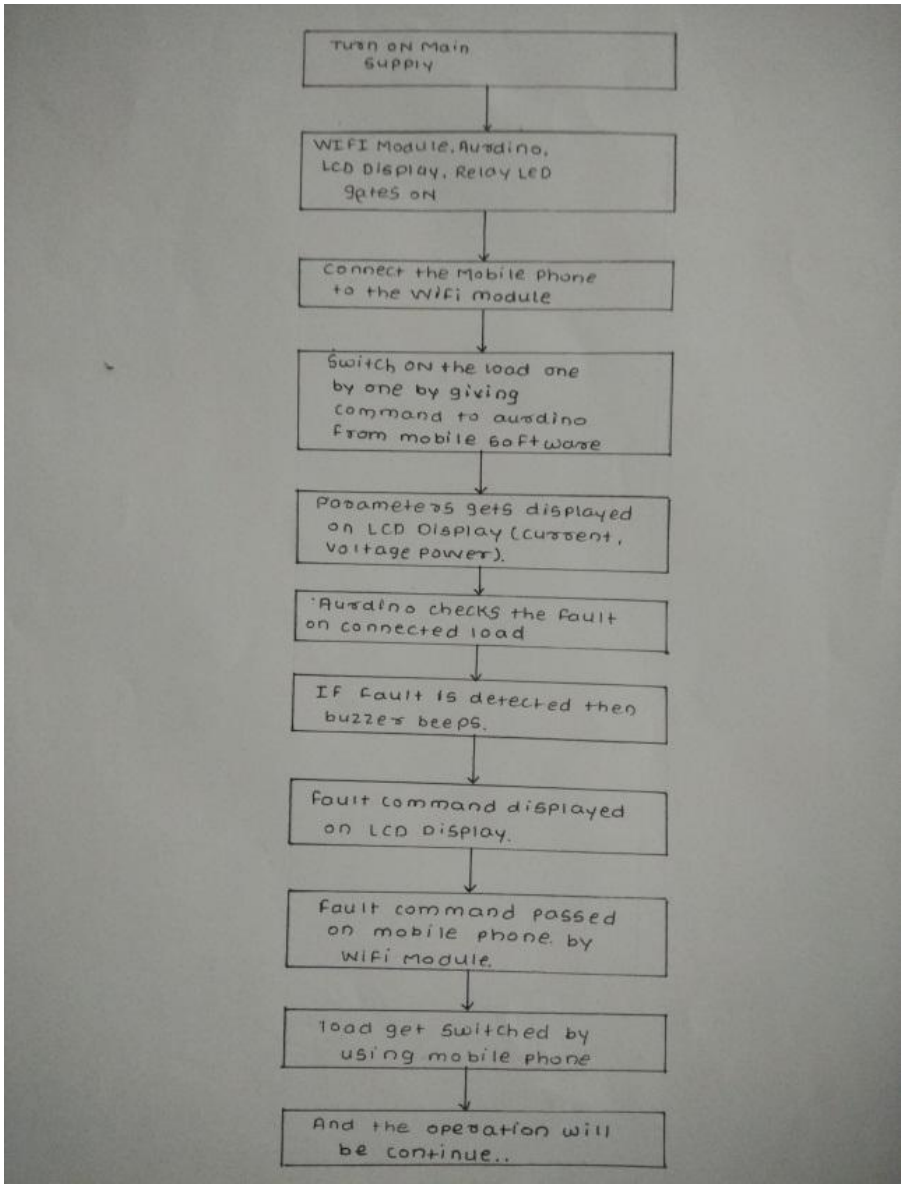

Fig no 1.1 flowchart

VI.CONCLUSION

1. APPLICATION

1. The system can be used in industry.
2. The system can be used at home for energy consumption monitoring.
3. The system can be used in MSEB.

2. ADVANTAGES

1. It saves energy.
2. reduces limitations of conventional system.
3. It requires less man power

3. FUTURE EXPANSION

1. We can implement the system using GSM and GPS we can send the message to multiple persons.
2. We will operate the system using solar panel.
3. We can introduce GSM in the system to find the real fault location

REFEARANCE

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[2.] Principles of electronics- v.k.mehta

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PREPARED BY

NAME: AMITA B. AACHAT
EDU: DIPLOMA IN THIRD YEAR ELECTRICAL
COLLEGE: GURU GOBIND SINGH, NASHIK
MARKS: 66.24%

NAME: PUSHKAR S. KUKAWALKAR
EDU: DIPLOMA IN THIRD YEAR ELECTRICAL
COLLEGE: GURU GOBIND SINGH, NASHIK
MARKS: 69.06%