

Research Paper

OPERATIVE MODUS TO ABATE ENERGY DISSIPATION IN DOMESTIC APPLIANCES USING PROCTOR GADGETS

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Electricity is most essential in all parts of human life. Hence Government is taking multitudinous ventures to outturn electricity. But also to manage the cost invested in producing electricity government usually increases the cost per unit for the energy consumed by the public. Hence public are the down and outer. So here we have contrived a gadget to monitor and display the power consumed by the domiciliary appliances using PIC controller and current sensor at every moment and the denouement is hereupon displayed in a LCD display and exceed of limit is indicated via SMS in mobile using GSM (Global System for Mobile communications) and Android applications and in turn can also prevent electricity theft since the user will have a proof for the exact units consumed.

Keywords: PIC controller, Power consumption, Electricity theft, LCD display

INTRODUCTION

- The energy meters are in use for many years but they display the energy consumed in the entire house or organization which may also include the electricity stole which the user may not be able to discriminate. If the energy consumed by individual appliance is discriminated the user can reduce the usage of that particular appliance if he wants to save electricity. Manual monitoring of the former and latter is difficult hence there rises a need of gadget.
- Current sensor is used to measure the power consumed by the appliance which is in turn connected to the PIC controller which manages the display of the power consumed by each load or appliance.
- Among all the controllers PIC controller is used, the reason lies within the fact that PIC microcontrollers are based on Harvard architecture. Harvard architecture has the program memory and data memory as separate memories which are accessed from separate buses. This improves

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bandwidth over traditional von Neumann architecture in which program and data are fetched from the same memory using the same bus.

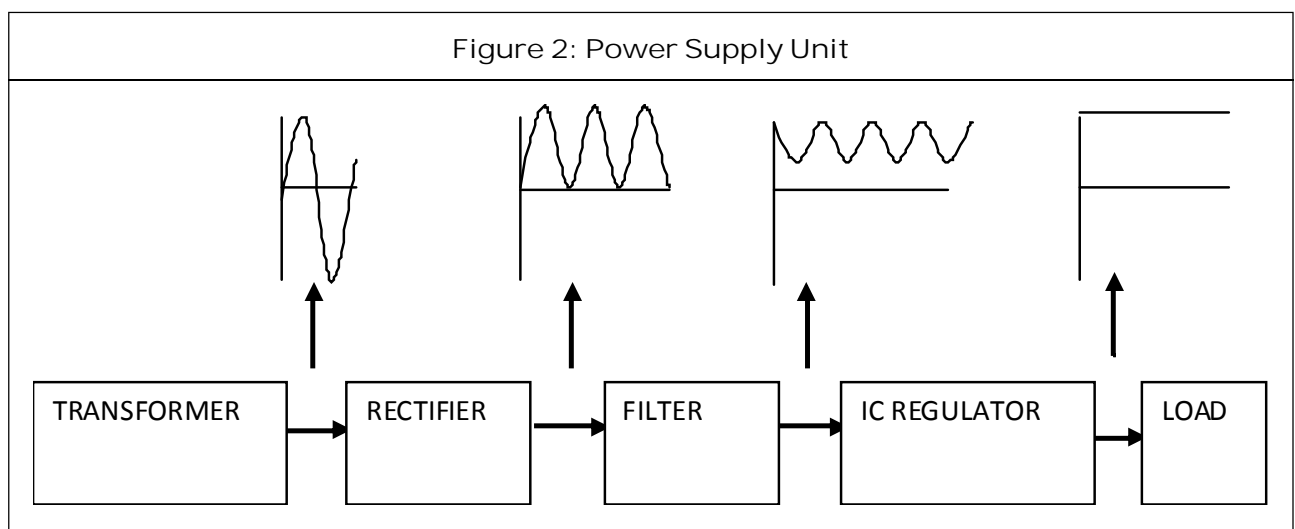
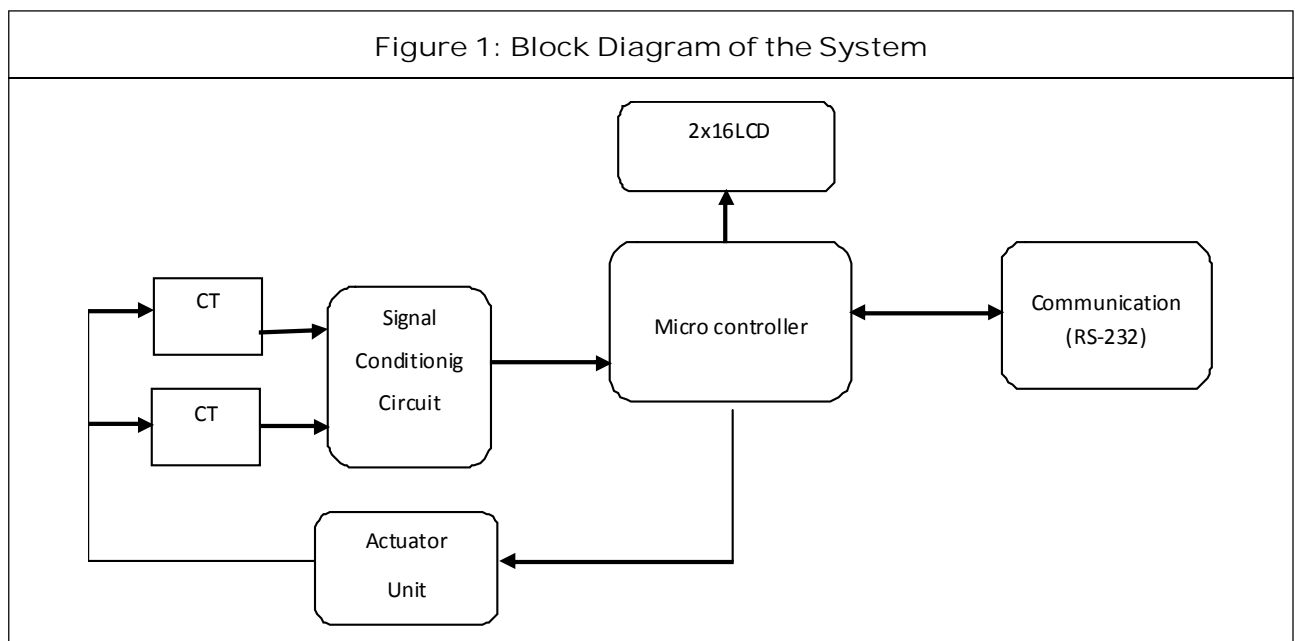
- PIC microcontrollers have a data memory bus of 8-bit and a program memory bus of 12, 14 or 16 bit length depending on the family. All PIC microcontrollers have a mix of different on-chip peripherals like A/D converters, Comparators, weak pull-ups, PWM modules, UARTs, Timers, SPI, I2C,

USB, LCD, and CAN, etc.

HARDWARE DESIGN AND SYSTEM COMPONENTS

Block Diagram Description

Input power supply given to consumer through actuator. Actuator acts as a switch, it is controlled by microcontroller current transformer and potential transformer are used measure the power by microcontroller. Display unit are used to display meter readings.



TRANSFORMER

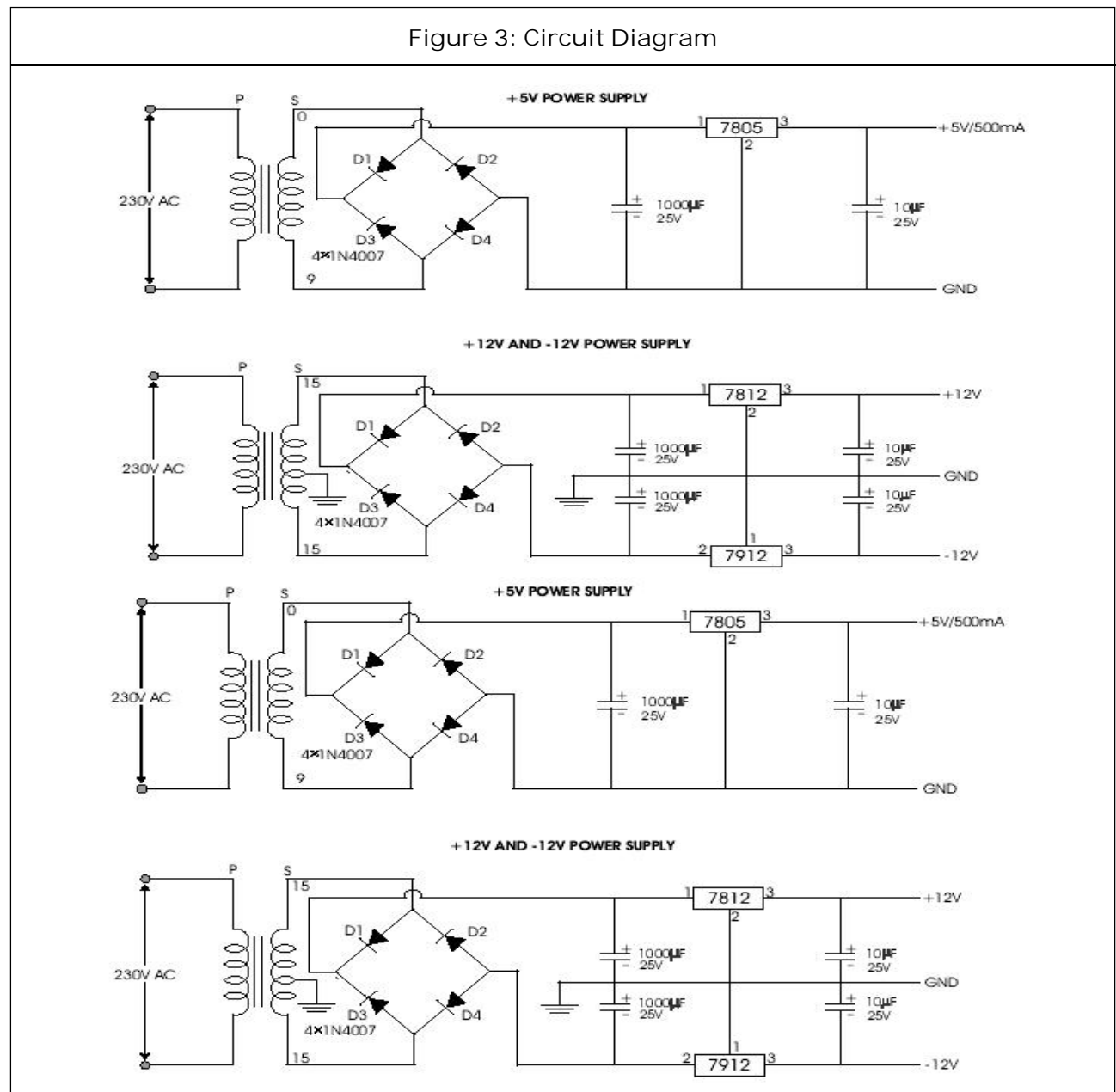
The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level. Then the secondary of the potential transformer will be connected to the precision rectifier, which is constructed with the help of op-amp. The advantages of using precision rectifier are it will give peak voltage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

BRIDGE RECTIFIER

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

Figure 3: Circuit Diagram



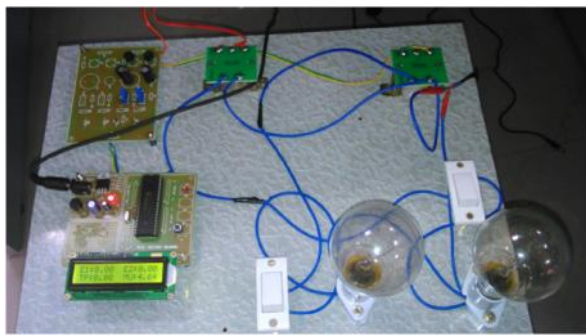
voltage. The regulators can be selected for operation with load currents from hundreds of milli amperes to tens of amperes, corresponding to power ratings from milli watts to tens of watts.

WORKING PRINCIPLE

The AC voltage, typically 220 V 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.

Figure 4: Hardware Photo



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