

# Pre-Indication of Battery Life for UPS

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**Abstract:** The main objective of this project is to provide uninterrupted power supply to a load, by switching automatically battery. The demand for electricity is increasing every day and frequent power cuts is causing many problems in various areas like industries, hospitals and houses. An alternative arrangement for power source is a must. In this project uses four switches to demonstrate the respective failure of that battery .When any of the auto switches is pressed it shows the absence of that particular source, switches are connected to system. The output of switches is given to the relay driver IC, which auto switches appropriate relay to maintain uninterrupted supply to the load. The output shall be observed using a LED drawing power supply from first battery initially. On failure of the first battery load is shift to another battery.

**Keywords:** Uninterrupted power supply (UPS), Liquid Crystal Display (LCD), Threshold voltage (Vth).

## I. INTRODUCTION

### 1.1 Problem Definition

The pre-indication of battery life for UPS system will continuously check the status of battery used in standby system and will take corrective action if needed. This system is proposed to pre-indicate the battery status as battery is dead, battery is about to die and battery is working properly. The system will give pre-indication of battery life for UPS which will overcome the human intervention required for continuous check of battery level. Thus automatically shift the load whenever battery is dead.

The system consists of:

- 1) Microcontroller
- 2) Switches
- 3) LCD Display
- 4) Battery

### 1. Microcontroller

This 89s51 Micro-controller shows the energy stored in the Battery on a 16x2 LCD Display. 89s51 micro-controller is used to switch between the batteries.

### SPECIFICATION:

- 1) Compatible with MCS®-51 Products
- 2) 4K Bytes of In-System Programmable (ISP) Flash Memory – Endurance: 10,000 Write/Erase Cycles
- 3) 4.0V to 5.5V Operating Range
- 4) Fully Static Operation: 0 Hz to 33 MHz
- 5) Three-level Program Memory Lock
- 6) 128 x 8-bit Internal RAM
- 7) 32 Programmable I/O Lines
- 8) Two 16-bit Timer/Counters
- 9) Six Interrupt Sources
- 10) Full Duplex UART Serial Channel
- 11) Low-power Idle and Power-down Modes

### 2. Switches

Relay is the key element used in this system. Relay is used as a switch in this project to switch between the different batteries depending upon the amount of charge stored in

them. Relay acts as a switch which is used to control the 230 volt AC supply. This relay will be turned off if there is no person inside the room. This relay can be used to turn off the electrical appliances like fan, tubes etc.

### 3. LCD Display

In this project we used 16x2 Alpha numeric LCD display to display the health of the battery and also used it into 4 bit mode .

### 4. Battery

Batteries store energy being produced by given generating source and when this source is unavailable this energy can be used by loads. The inclusion of storage in any energy generating system will increase the availability of the energy.

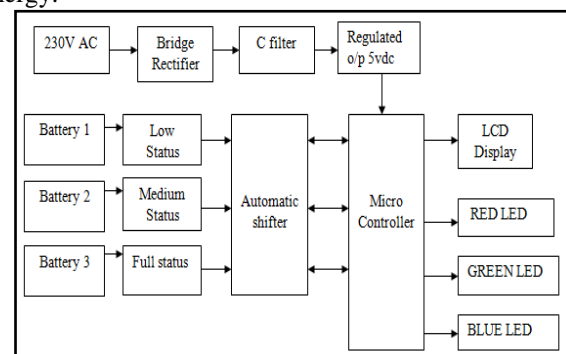


Figure 1.1: Complete block diagram of the system

## II. RELATED WORK

1) A number of strategic equipments are used in the detection of battery voltage level monitoring system, automatic shifter for shifting the load whenever necessary.

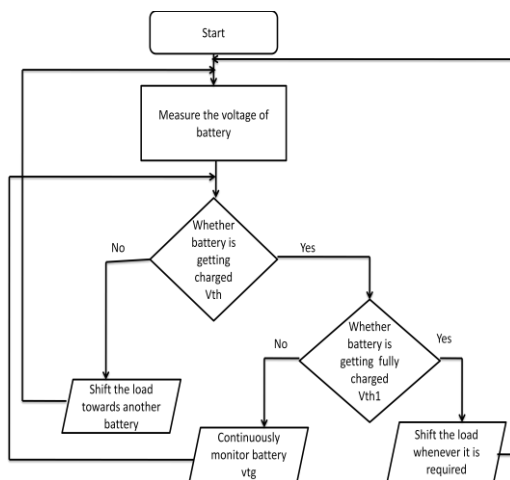
2) Battery is dead-

The voltage level monitoring circuit will be continuously monitoring the voltage of respective batteries and will compare it with Vth while battery is getting charged. If the

voltage measured is found to be less than that of  $V_{th}$  then the corresponding action will be taken by microcontroller and respective signal will be given to an automatic shifter so as to shift the load automatically.

3) Battery is about to die-  
The system designed will also give the status of battery which is about to die. In this stage system will compare the battery voltage with  $V_{th1}$  and shift the load if  $V_{th1}$  is found to be less than or equal to  $V_{th}$  while charging.

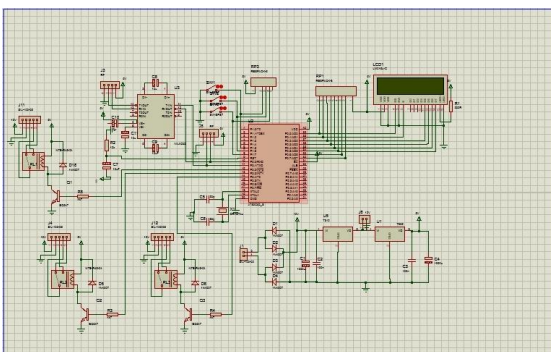
### III. FLOW CHART OF THE SYSTEM



Description of flow chart:

- 1) System initialization
- 2) Measure the voltage level of battery whether battery is getting charged if no then shift the load towards another battery.
- 3) Measure the voltage level of battery whether battery is getting charged if yes display the corresponding voltage of battery on LCD and continuously monitor the battery voltage and compare it with  $V_{th1}$ .
- 4) After detecting the charging status if battery is not getting full charged then monitor the voltage till battery dies and if battery dies then shift the load.
- 5) After shifting the load towards third battery and if its getting fully charged then continuously monitor the system and repeat the procedure.

### IV. SIMULATION RESULTS



4.1 Overall system circuit diagram of pre-indication of battery life for UPS

### V. CONCLUSION

We have implemented system which is giving pre-indication of battery life for UPS hence which will overcome the human intervention required for continuous check of battery level. Thus automatically shift the load whenever battery is dead.

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