

SMART UPS WITH MICROCONTROLLER BASED MONITORING

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ABSTRACT - Uninterruptible power supply (UPS) monitoring system using message queuing In a big infrastructure, telemetry transport protocol provides a solution to UPS monitoring problems.

In this project, the IOT protocol for SMS conversations is used to demonstrate the minimal amount of message data. The system outlined in this project used a microcontroller that was WiFi connected to the Internet of Things based on the DATA cloud concept. The system's communication protocol, graphical, was created with lightweight communication in mind. This arrangement was intended to display UPS monitoring data. UPS parameter could be monitored using a graphical application. There were some differences in data obtained from sensor with the measurement results of measuring instruments specified for each parameter: the difference of input voltage was equal to 0.20%, while differences of output voltage, output power and output current reached 1.34%, 0.17% and 20%, respectively.

I. INTRODUCTION

There is a constant transition towards electric and hybrid vehicles due to the growing worldwide awareness of global warming and the growing demand for sustainable fuel and energy. Temperature, charging strategy, and depth of discharge (DOD) are a few examples of variables that affect battery performance. This study aims to provide an internet of things-based battery voltage and current metering. Lead-based batteries are very effective at powering many different applications. They are easy to obtain, relatively inexpensive, and provide a lot of power to whatever they are hooked up to. Regrettably, if there is no monitoring the charge, the battery will eventually run out of power. In addition to determine the charge of the battery, the current voltage of the battery is needed. By depending on the output voltage of the battery, the approximate charge of the battery in the system can be estimated. A backup power system at a minimum in form of an Uninterruptable Power Supply (UPS) is a must to keep your systems operational in the event of an outage. In case of power failure UPS is the device that maintains power. UPS mainly consist of battery, battery charging circuitry and inverter circuit. In case of power

failure the battery supplies power as long as it can last. UPS are good for backing up important system as well as their data in case of power failure. Loss of data can be prevented by using UPS. It provides a power source in case of main power failures blackouts. In many scenarios they also regulate incoming voltage to the system so that constant supply to the system is maintained and hardware of the system won't be damaged by power spikes. When there is power failure. The efficiency of process organization is doing decreases and it affects the productivity of an organization. This power failures may cause by system switching, weather conditions, hardware faults, high power demands etc. To monitor UPS continuously and manually is difficult and not hustle free. To tackle this, we have proposed our system You can take quick corrective actions based on insights gained from monitoring. In case any UPS fails or any of its parameters change, the technician can be alerted through SMS. This will not only help in detecting the faults, but also determining the condition of the UPS at that particular moment.

II. BLOCK DIAGRAM

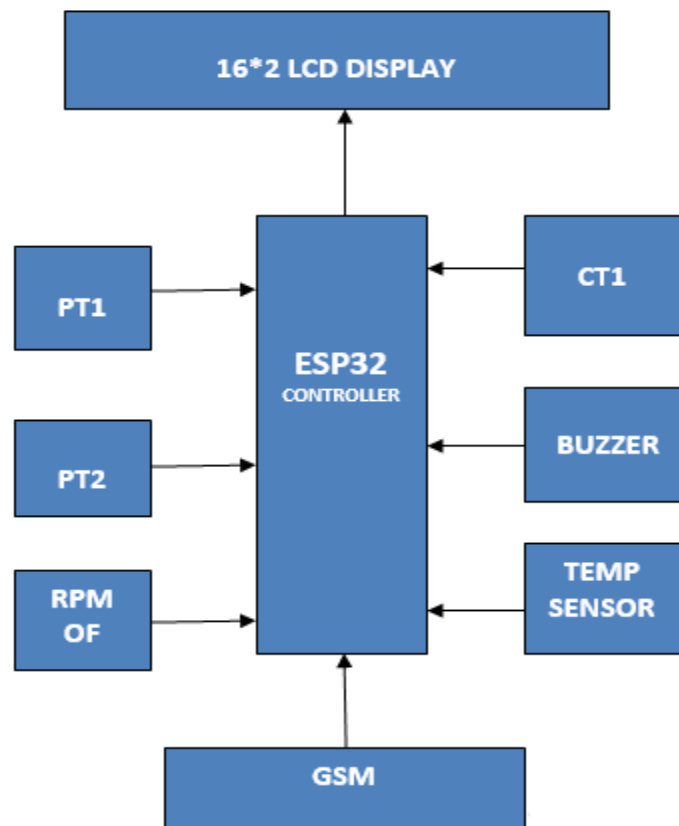


Fig. 1-Diagram: Block Diagram for the contactless train

A. WORKING

The UPS will be immediately come to active when the power supply is switched off and leads to no damage. The productivity of the industry will not get down if they have the UPS connected to the loads. The loads will be running continuously without off when they are connected to the UPS. The UPS will be automatically come to on with in 25ms continuously monitoring and controlling of the UPS. Here two current sensors are used, one is connected to the UPS to measure the inward current that the UPS is consuming to charge complete another sensor is connected to load to me much amount of power that the load is Here the current sensor will be work with 20A.the first sensor will be connected with the relay and to Arduino through the control and input pins. As the first sensor is connected to the UPS and sensor will also be connected to the relay and to Arduino through the control and input pins. relays are connected to the analog pins.

The first sensor will be connected to the UPS know the power that UPS is consuming and second sensor is connected to the load to calculate the output power. The current readings and the Energy

B. Hardware Implementation

MICRO-CONTROLLER UNIT: The heart of the whole project is the Micro-controller unit. For this project the ESP32 Micro-controller was used. It is a low power general purpose micro-controller with good processing speed, small physical dimension, that is durable and cheap.it having in built wifi and Bluetooth.

In above diagram as we see that the all the components is communicate with the esp32 microcontroller it is the heart of our system and hence the all the devices input and output is attached with the controller ..

2) *LCD DISPLAY:* this is 16*2 display which shows the process output like ,temperature of the system is observe by the ups,also monitor the over current of the system.

3) *ACS712.* : this is a used for to checking the load in the system the overall system is working on the

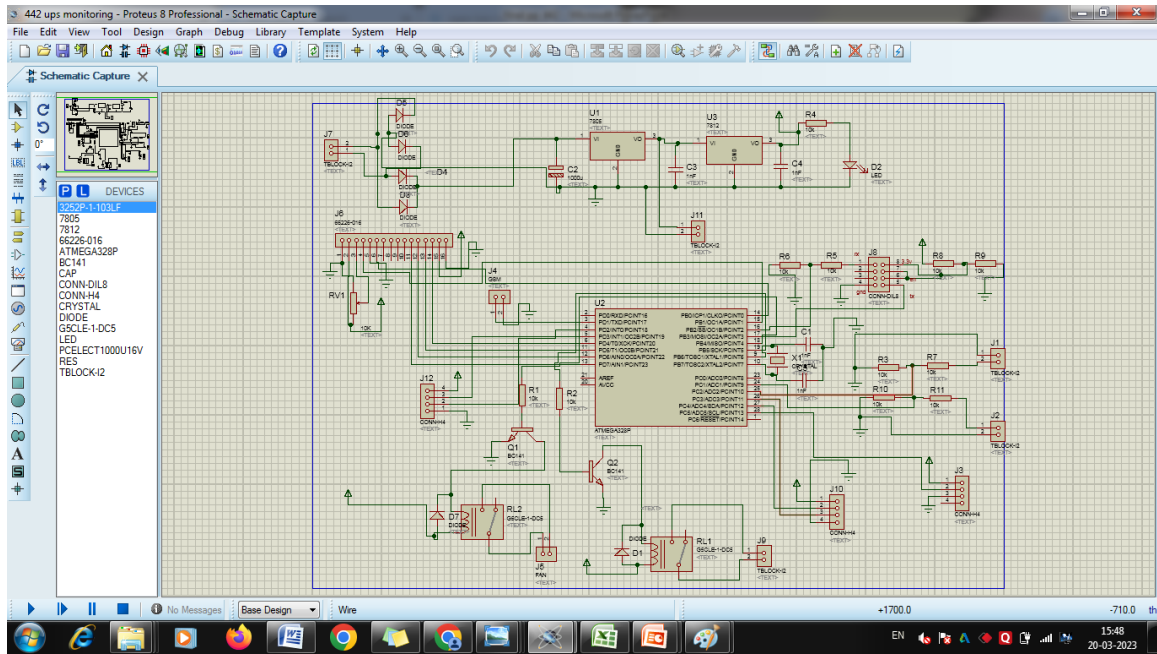
4) *THE POWER SUPPLY UNIT:* Now days, almost all electronic equipment includes a circuit that converts ac supply into dc supply. The part of equipment that converts ac into dc is called DC power supply. In general at the input of the power supply there is a power transformer. It is followed by a rectifier (a diode circuit) 1a smoothing filter and then by a voltage regulator circuit.Here In our system we were design a 5v and 12v power supply for our electronic device .

5) *GSM MODULE :*The Gsm Is Used For The Sending Message To The Customer About The Project Load If The Load On The Usp Is Increases Or The Ups Having Any Over Laod Then The Message Is Send Is On Given Mobile Number .

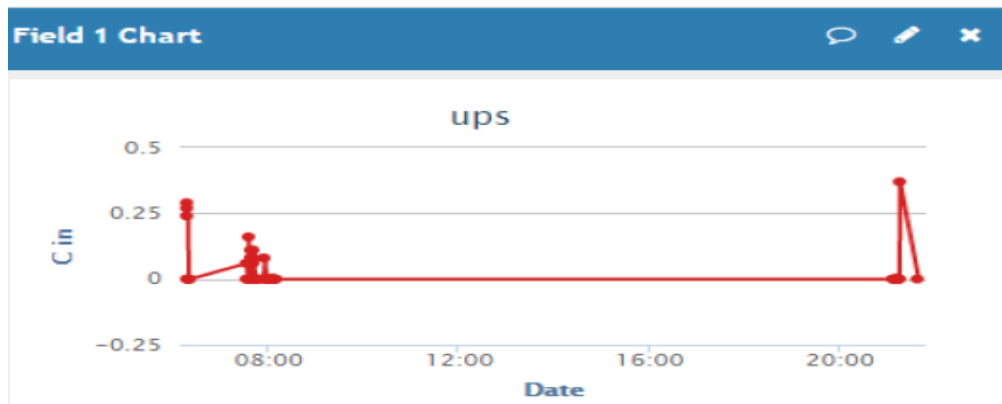
6) *Buzzer :* The Buzzer Is Beep On The Time Of Over Current Or Temperature Is Exceeded.Or The Load On The Ups Is Increased Then The All Alert With The Beeping Sound Of The Buzzer .

7) *Temperature Sensor :* the sensor is used for the detect the temperature of the ups.

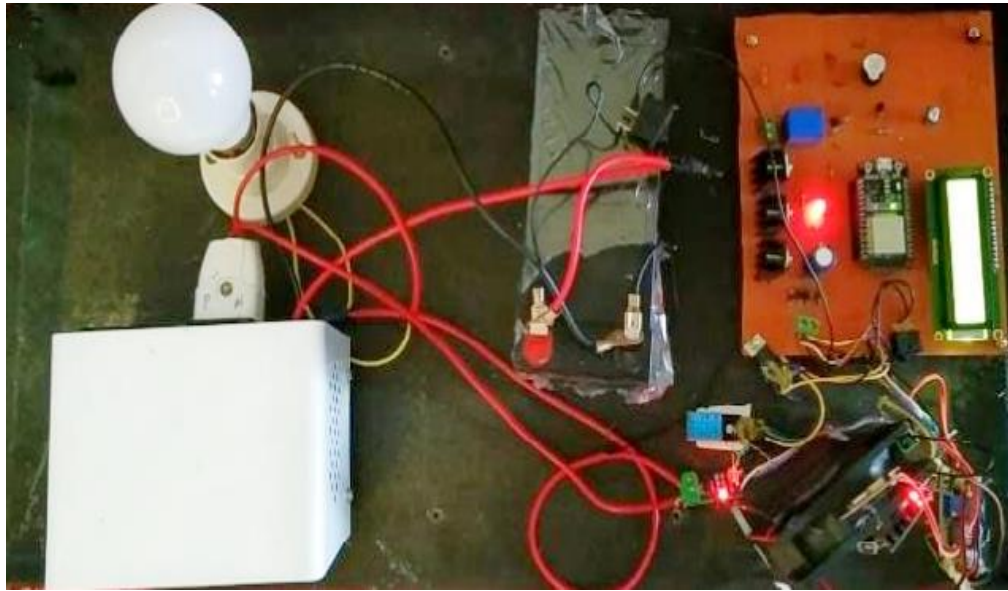
III. PCB DESIGNING



IV. RESULT



V. FINALE DESIGN OF PROJECT



VI. CONCLUSIONS

We come to the conclusion that we have developed an electronic system using GSM that will continuously monitor the UPS battery and send out an SMS alert to the user in the event of a power outage or an unexpected drop in battery life.

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