Real Time Clock Editable Power Control for Labs

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A B S T R A C T

Now a days we all know how important electricity in our entire life. So we try to save electricity through this project in industrial areas, hospitals, government offices, or college campus. In this project we save the electricity using editable RTC (real time clock) interface with arduino. The brain of this project is arduino. Using this or executing the program of arduino we set the total required power for college labs, or hospital labs. RTC used for setting the time period of college practical for ex. When college practical are started or the RTC detect the time then system provides the required power to the lab. Or when the practical is off after some time wattage are reduced so no body cant waste the power. And also there is a one CT is present to control the current if the over current flows in the system current transformer trip the relays one by one. Bluetooth is also provide in this project when we want to change the practical timing we can done this using Bluetooth module we connect the Bluetooth module to our handset Bluetooth and we change the RTC timing. In this project We used LCD to display the total power wattage for labs and the used wattage

Keywords: Arduino , RTC, CT, LCD Display.

1. Introduction

This is a real time project. This project is used for decrease the wastage of lab power during off practical timing. In this project the various section of any college campus lab the power is allotted to lab according to their practical timing. The user decides the timing of practical through real time clock also we use CT in this project to control the current. The RTC decides the timing which can be change as per schedule. In this project the amount of wattage as per total calculated as per equipments. Sanction wattage of lab is selected from Arduino. This project is not only for college power lab this is also useful in industry, government offices and hospitals.

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2. Simulation Diagram
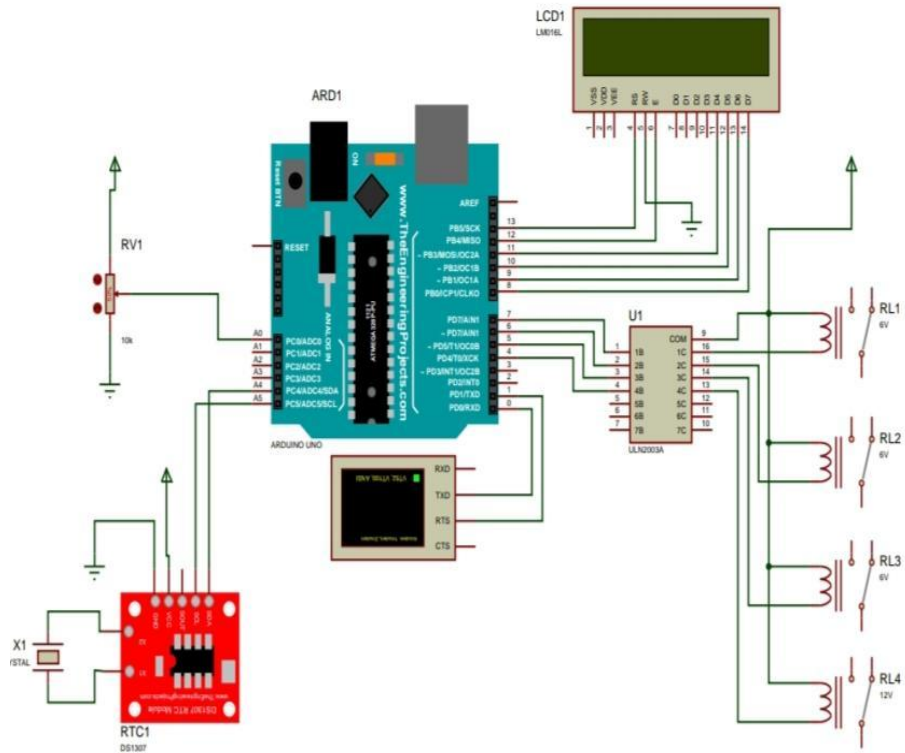
3. Block Diagram
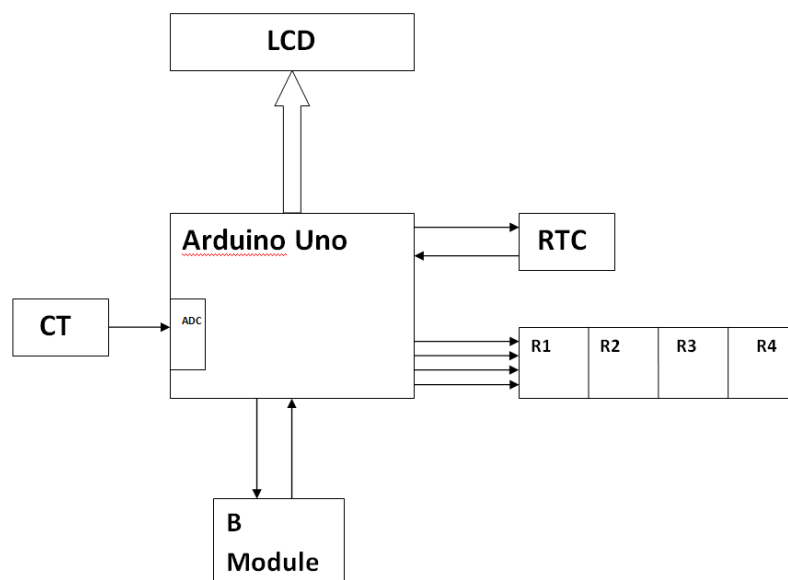
4. Block Diagram Description

This is the block diagram of real time clock editable power control for labs.In which we can use Arduino, RTC, CT, LCD and Bluetooth module. The relay gives the power to the Arduino, connected to the RTC. User set the practical time in RTC.When practical is starts relay gives limited (set value) power supply to the consumers. If the consumers increase the wattage the system does not allow and reset. After the practical the wastage of power is avoided by control of minimum wattage after time which is reduced 100 watt so no body can't waste consumption of power.
 The amount of full or low power delivered is decided by RTC. Also we change or edit the time or the schedule of the practical by using our handsets through Bluetooth module. We can change the time or edit the time easily with the use of mobiles, so the project names like real time clock editable power control. The CT (current transformer) is used to control the flow of current. First user set the current value and power wattage in Arduino programming if the current is over flow compared to set value then automatically relay will trip.

5. Parts and their specification

 1.Arduino Uno-
Arduino UNO is microcontroller board based on 8 bit ATmega328P microcontroller. Along with ATmega328P, it consist other components such as crystal oscillator, serial communication, voltage regulator, etc to the microcontroller. Arduino UNO has 14 digital input/output pins (out of which 6 can be used as PWM output), 6 analog input pins, a USB connection, a power barrel jack, and ICSP header and reset button.
Here is the Arduino UNO:
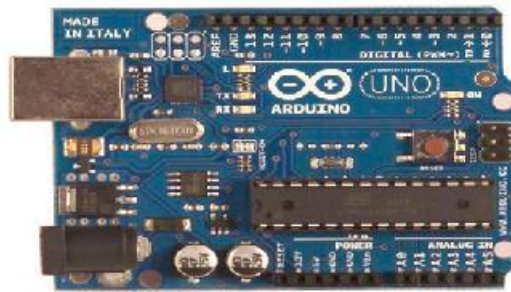
Technical Specification:

|	
Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended) 7-12V	
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB of which 0.5 KB used by
bootloader	
SRAM	2 KB
EEPROM	KB
Clock Speed	16 MHz

2. RTC(REAL TIME CLOCK):
Real time clock counts seconds, minutes, hours, date of the month, month, day of the week and year with leap year. It has two-wire serial interface. It consumes less than 500nA in battery backup mode with oscillator running. it has programmable square-wave output signal.

3. LCD Dispay:

LCD module are very commonly used in most embedded project. It has 16 columns and 2 rows. Its operating voltage is 4.7V to 5.3V and current consumption is 1mA without backlight. It can work on both 8-bit and 4-bit mode. It can also display any custom generated characters.
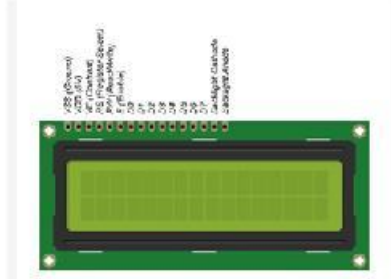
4. RELAY:

Relay mainly used for more than 3A load switch, and equipped in household appliances also in industrial   equipment. Power relay for printed circuit boards offer superior performance in high capacity load switching in power supply system owing to its material that can resist to contact arc and single contact structure. It has two type of seal available; flux protection and fully sealed.

5. CT (CURRENT TRANSFORMER):

Current transformer is a type of current transducer that will give current in the secondary which is proportional in magnitude to the current flowing through the primary. These are used to convert high currents from power circuit into a measurable and control devices. They provides isolation to the ammeter, other measuring instrument and control devices from high voltage power circuitry.

6. HC-05 Bluetooth Module:

HC-05 Bluetooth Module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Its communication is via serial communication which makes an easy way to interface with controller or PC. HC-05 Bluetooth module provides switching mode between master and slave mode which means it able to use neither receiving nor transmitting data.
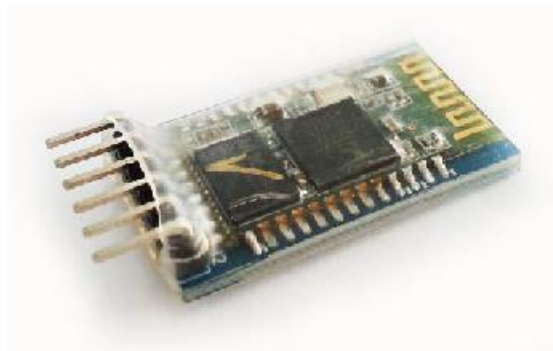
Specification:
Model: HC-05
Input Voltage: DC 5V
Communication Method: Serial Communication
Master and slave mode can be switched

6. Conclusion

From above paper we conclude that over proposed work is based on Real Time Clock Editable power control for labs. This system is the efficient, reliable, portable and economical viable solution for save the electricity and consume the time. In future we use this system for saving the electricity and also we properly follow schedule of our lectures and practicals.

REFERENCES

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