

Smart Switch

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Abstract — this paper discusses the utility of a smart switch. The switch is programmable to a specific time and after the timer expires, the switch turns off. This project has been implemented using relay as a switch and Microcontroller's (AT89S52) Timer for time keeping.

Keywords— smart switch, AT89S52, relay, programmable switch.

I. INTRODUCTION

The project idea came from a problem that many of us face with mobile phone. After using the mobile phone for the entire day we often find our phones discharged at night, when we're about to sleep and then we are left with no choice and leave the phone to charge over the whole night. This prolonged duration of charging is prone to damage the mobile phone battery. Today many phones use "trickle charging" to protect mobile phone batteries but, trickle charging for larger durations will damage the battery and cause it to heat up. In short your phones battery life is bound to reduce faster due to overcharging. Thus to solve this problem we intend to build a programmable switch which will automatically turn off the switch of the charger after a predetermined time. This project will be developed using the AT89S52 microcontroller. The inbuilt 16 bit timer will be used for maintaining the timings of the switch.

II. BLOCK DIAGRAM

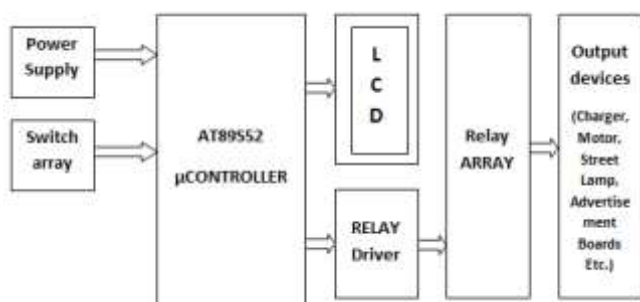


Figure 1: Block Diagram of the System

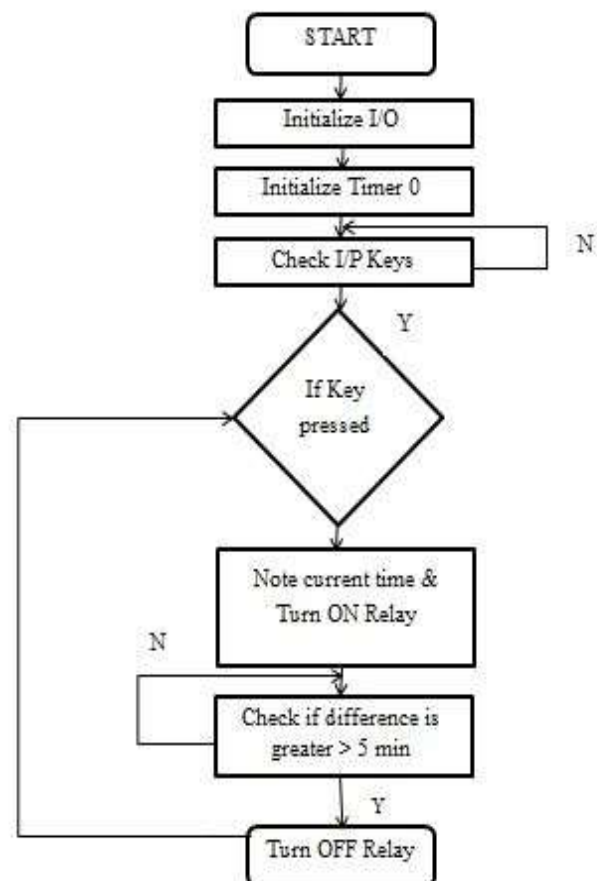
The power supply of +5V is derived from the 230V which is stepped down to 12V AC and then rectified and regulated via a voltage regulator (IC 7805) to +5V DC. This +5V DC, takes care of the power required by the microcontroller. Then a switch array which is a push button is connected to the microcontroller which is used to trigger the relay ON or OFF. The brain of the project microcontroller is used to read the switches, maintain time keeping, control the relays and drives the LCD. The LCD is used to display the status of relay. A current amplifier is required to drive the relays as

the current provided by the microcontroller's pins is not sufficient to drive the relay; hence an IC ULN2003 is used as the relay driver. Then relays are used to switch high voltage AC (Alternating Current) or DC (Direct Current) devices using low DC voltage.

III. WORKING

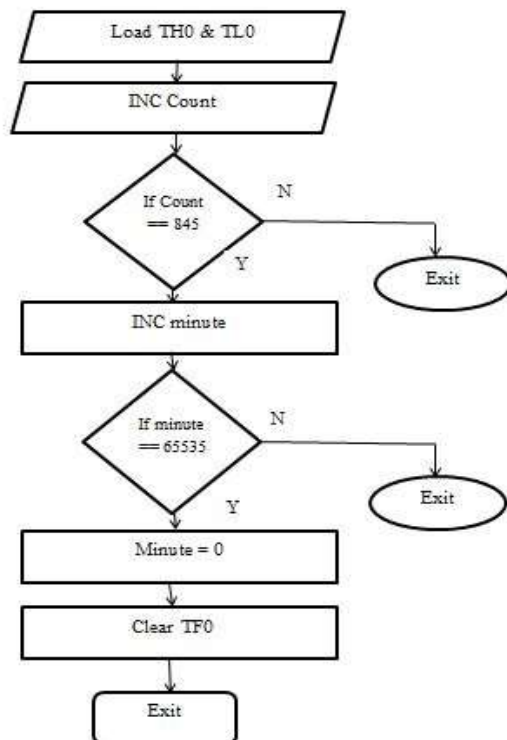
FLOW CHART

Main Process:



TIME KEEPING ALGORITHM

Timer 0 ISR:

**IV. ADVANTAGES:**

1. The major advantage of using this project is the user does not have to worry about turning OFF the device that has been turned ON.

2. It helps save energy.
3. Helps improve battery life cycle and ensure good battery health in mobile phones.
4. Reduces E-waste.

V. APPLICATIONS

For charging mobile phones and preventing overcharging them.

In industries where precise timing is required.

For example, consider a device that need to be shut down after precisely one hour.

Now there can be human errors in this particular case, but our project will ensure timely turn off.

In Farms and garden.

For example, in farms motors can be turned on and off at fixed time and for a fixed interval. So the person does not have to go and turn on and off the motor every time. The switch needs to be programmed only once.

VI. FUTURE SCOPE

In future we plan to add a Bluetooth interface to the project and build a mobile app with a GUI that can turn ON and OFF the devices and set custom timer for each switch thus making this project even smarter.

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