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DESIGN OF PREPAID SOCKET USING SOLAR PANEL WITH POWER CUTOFF

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ABSTRACT

The Prepaid socket are very important in making consumer to have sense about consuming energy, generally socket provided in public sector having same amount in every socket by which some of the electrical gadgets charger may get destroy dur to excess amount of supply. Everyone is surrounded with electrical gadgets and electrical appliances need to be charge time to time for fluent work so for that public sector provide sockets. Many sockets are destroyed due to the excess amount supply socket got short and energy is wasted by seeing all this prepaid socket helps you to understand which amount socket is used for which gadgets we can consume energy, there is a long life for the socket, less maintenance required and it does not require to change frequently. Coin based socket will provide good service and the money collect will use for replacements. This project is aimed at developing a prototype for management system for the prepaid coin-based socket system

Keywords: Coin based sockets, solar panel, relay

I INTRODUCTION

Electricity is a vital element required for economic growth, poverty reduction and social development. Efficient and sustainable usage of electricity has become a global concern. Smart Grids, for many, the next big technological revolution since the invention of the Internet, will play an important role in tomorrow's societies. In most of the developing countries, the idea of the prepaid entering scheme has been introduced.

Smart sockets, along with the prepaid system, have become popular since it provides better facilities for both consumers and utility. For consumers, there is no hassle of disconnection and re-connection. Moreover, the utility receives payment earlier and keeping records are not needed. Serial communication is a communication technique where data transfer occurs by transmitting data one at a time in sequential order. In our system, serial communication has been used for a combined network so that servers are not required for communication which reduces cost. Optical fiber has been used for communication as regular maintenance is not required, and it is also waterproof.

Moreover, they can increase the reliability of the electricity supply (reduced blackout rate)byreal-time measurements, monitoring and control of the generation, and transmission and distribution networks. Further, they can render the utilization of base-load power plants and electricity transport infrastructure more efficient, deploying dynamic pricing and demand response strategies.

II LITERATURE SURVEY

In recent times, there have been lots of advancements in technologies being developed for charging the electrical gadgets. In most cases solar energy is used for charging sockets. Solar energy converts light energy into DC current and supply in sockets. A fixed solar panel of size 635x550x38mm, The SCU converts low pulse to

high pulse and fed as input into driver circuit and driver circuit provides sufficient input voltage of relay. This will be supply to socket. The microcontroller performs the countdown time period for a 3minutes, with LCD display shows the actual time left. During the time period a relay was out latch and finishing time in progress. In it experimentally investigated the working of Coin based socket system with solar tracking system by peak power positioning in this experiment the operational amplifiers can operate the ON/OFF and directional functions of the structured five motors. These motors rotate in two axes. The tracker's sun sensor is mounted. From the output of this device, it will check the outputs are all equal, then the collector structure is nearly perpendicular to the sun and tracking error is reduced. According to the renewable energy is the main source of one of the renewable energy sources is solar energy. This energy generated more energy because the solar panel is to maintain a perpendicular to the sun's rays. In this scenario, it monitors the solar energy as well as battery power when the coin is inserted in the coin box. Once the coin is detected, it sends signal to the Raspberry pi and it trigger the relay and the LCD display show the countdown time. The Raspberry pi can collaborate with the outside world. The relay generates the voltage and fed as input to electrical gadgets.

III MODULES OF PROPOSED SYSTEM

This section describes the modules for the proposed system.

- **Input stage**-To accepts the valid coin.
- **Controller**-To control the voltage using relay.
- **Power**-To supply the power based on the requirements.
- **Output and display**-To display the output information.

1. Input Stage: The user inserts a coin to the coin insertion slot. The sensor is attached to the coin insertion slot and the coin is validated based on the diameter of the coin inserted. Initially the LCD display a message as "Please insert coin". If the inserted coin is valid, the message is displayed in the LCD and signal is sent to the microcontroller. If the coin is not valid, it is returned back. When the coin is accepted, the microcontroller and relay is activated and the battery starts getting charged by the software of relay.

2. Controller: The system performs according to the input signal from the circuit. Based on the diameter of the coin, the coin is either accepted or rejected. If the coin is accepted, it sends signal to microcontroller along with LCD interface. Once the microcontroller receives the signal from the coin insertion slot, it sends signal to the relay. The relay generates the voltage of 5v, which is provided to the gadgets for further use

3. Output and Display: The LCD connected displays the messages as and when required. Initially, when the gadgets cable is connected the LCD displays as, "Please insert coin". When the gadgets are connected, it displays "Gadgets connected" and the duration of charging based on the coin inserted.

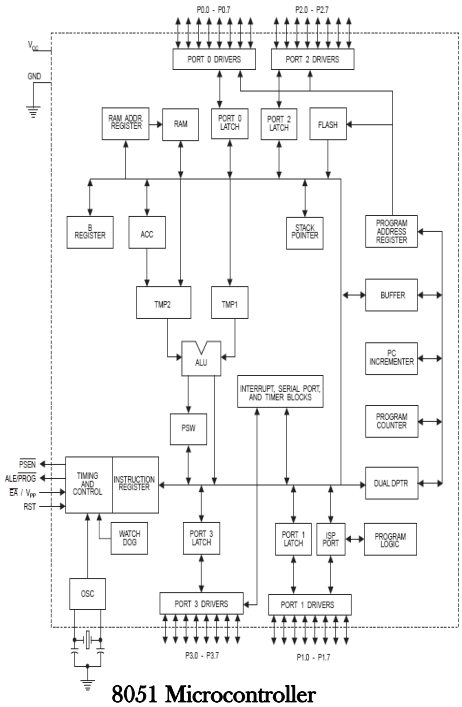
4. Power: This coin-based sockets draws power from the solar panel through relay. The voltage is regulated based on the type of the gadgets connected for charging.

IV COMPONENT

- 8051 Microcontroller
- LCD (Liquid crystal display)
- Socket
- Relay
- IR Sensor
- Solar panel

1.8051 Microcontroller: The microcontroller memory is divided into Program Memory and Data Memory. Program Memory (ROM) is used for permanent saving program being executed, while Data Memory (RAM) is used for temporarily storing and keeping intermediate results and variables. Depending on the model in use (still referring to the whole 8051 microcontroller family) at most a few kb of ROM and 128 or 256 bytes of RAM can be used. However

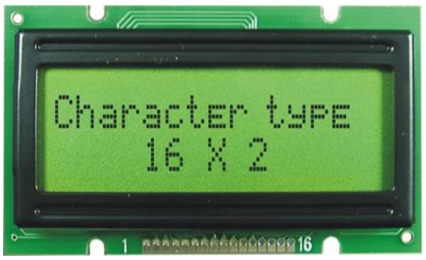
All 8051 microcontrollers have 16-bit addressing bus and can address 64 kb memory. It is neither a mistake nor a big ambition of engineers who were working on basic core development.



8051 Microcontroller

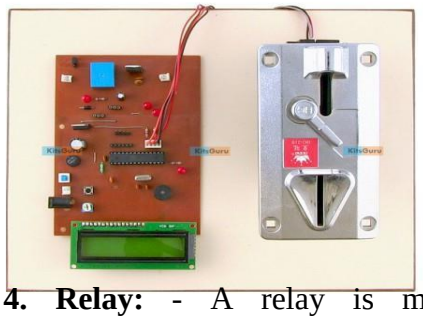
2. LCD (Liquid Crystal Display): LCDs are available to display arbitrary images or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

LCDs are used in a wide range of applications including computer monitors, televisions, instrument panels, aircraft cockpit displays, and signage. They are common in consumer devices such as video players, gaming devices, clocks watches, calculators, and telephones, and have replaced cathode ray tube (CRT) displays in most applications. They are available in a wider range of screen sizes than CRT and plasma displays, and since they do not use phosphors, they do not suffer image burn-in.



LCD Display

3. Sockets: The objective of this project is inserting the coin using socket in public places. This project is very useful to people who are all using electrical gadgets without charging condition in public places. In this project, who are all using electrical gadgets in outside of home are office without charging condition. The coin based socket is very useful to that person for using coin to charge for that gadgets. A sensor system is used to detect the presence of coin. It may be of different type. The coin is inserted between the transmitted and received signal.

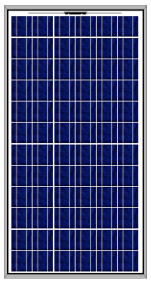


4. Relay: - A relay is most simply an electronically controlled switch. Switches come in all types of forms and so do relays. Relays like switches can exist in SPST, SPDT, DPDT, styles, and so forth. The first part of the word SP tells how many poles there are. SP is single pole, DP is double pole, and you can have multiple poles. The next part is the throws. Again, ST is single throw, DT is double throw. I like to say that you have a control line in for the pole and the number of outputs is the throw.

SPST switches are the simplest and the best example is a light switch. SPDT is like a single switch that controls a fan and a light. DPDT is a switch that can control two lines with a throw of the switch for instance a motor on a DPDT switch can be reversed clockwise and counter clockwise. An important note is that you can combine two SPDT switches to form a DPDT switch and similarly do the same with SPST to form a DPST switch. When costing your robot's parts, sometimes it better to buy one part in volume and change the design.

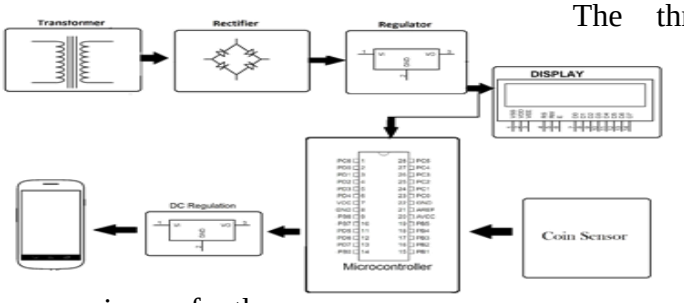
5. IR Sensor: An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting it called a passive IR sensor usually in the infrared spectrum, all the object radiate some form of thermal radiation

6.Solar Panel: Solar panel is the renewable source of energy. It is one of the fastest-growing renewable energy technologies and is playing increasingly important role in the global energy transformation. Solar panel are those devices which are used to absorb the sun's rays and convert them into electricity or heat. A solar panel is actually a collection of solar (or photovoltaic) cells, which can be used to generate electricity through photovoltaic effect. In this system we are using polycrystalline solar panel. Polycrystalline solar panel consist of several crystals of silicon in a single PV cell. Several fragments of silicon are melted together to form the wafers of polycrystalline solar cells.



Solar Panel

V METHODOLOGY



The three pins of the coin sensor are connected with the microcontroller board. One pin is connected with the pin 2 in microcontroller and the other two pins are connected with the positive and negative terminal of the solar panel. Once the coin is inserted into coin sensor, it validates the coin and sends signal to the system. The system will send the signal to LCD 16x2 display. The LCD displays the amount of time to be charged. System will start suppling energy to the gadgets according to the number of valid coins. If the coin is invalid then the LCD displays a message as "INSERT THE COIN".

System Diagram

VI RESULT

In this work we have design the simple coin base socket with solar panel connection. This system will work according to the amount of coin is inserted and this will provide the amount of energy you required the money will be used for repair and for better placement of the system. As this system required less maintenance and long-life

VII CONCUSION AND FUTURE SCOPE

In this project we aimed to the serve the environment-based project to consume and store the source and for better use without wasting of any energy. We create and design the coin-based prepaid sockets which is performing under solar panel it generates the energy from solar and give output to the consumer for better use this have future scope for better energy consuming people many also understand the amount of energy they required and they have to use accordingly

VIII ACKNOWLEDGEMENT

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