COIN-BASED MOBILE PHONE CHARGER WITH HIGH SECURITY

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Abstract: ***(11Bold)*** *Mobile phones are phenomenal in recent years for communication as well as in day-to-day life. Hence, charging the mobile phones has become the greater task. In this project; we are trying to design a mobile battery charger on coin insertion. As uses of mobile phones are increasing day by day it need battery life all the time, so in order to use them public charging is needed which would be useful for mobile users. This system will charge the mobile phone for a particular time-period. When the valid coin is recognized, it will start giving power supply to the cell phone through one of the adapters. We will be using a global charging adapter that would be suitable for all mobile phones. The mentioned system can be implemented in public places like railway stations, bus stops, hospitals, malls, etc. to avail the services. The objective of this project is inserting the coin using charge for your mobile phone in public places.*

This project is very useful to people who are all using mobile phone without charging condition in public places. In this project, who are all using mobile phones in outside of home are office without charging condition. The coin-based mobile phone charger is very useful to that person for using coin to charge for that mobile. The IR (infrared) transmitter is used to transmit IR signal in the transmitter side.

The IR receiver is used to receive the IR signal in the receiver side. Between the IR transmitter and receiver, insert a coin to change the polarity of pulse in SCU input. The SCU is used to converting low pulse to high pulse and that pulse is inverted in inverter. The 555 IC is act as a timer to produces high pulse for particular time period. Again the SCU is used to converting low pulse to high pulse and this output is give to input of driver circuit. Driver circuit is used for provide the sufficient input voltage of relay. The relay will on to activate the 230v charger, we will use charger to charge for our mobile phone.

Key Word*: Mobile Phone, Atmega Microcontroller, Coin acceptor, LCD display, SMPS, Relay*

I. Introduction

The goal of this idea is to insert a coin utilizing a mobile phone charging in public places. This invention will be incredibly beneficial to those who use their phones in public locations without being able to charge them. In this initiative, everyone who uses a cell phone outside of the home is working in an office that is not equipped with a charger. The coin-based mobile phone charger comes in handy for those who prefer to charge their phones using coins. The IR receiver is utilized on the receiver side to receive the IR signal. To adjust the polarity of the pulse in SCU input, place a coin between the IR transmitter and receiver. The SCU converts low pulses to high pulses, which are then inverted in the inverter.

The 555IC is used as a timer to generate a high pulse for a set amount of time. The SCU's gain is utilized to convert low pulses to high pulses, and the output is sent into the driver circuit's input. The driver circuit ensures that the relay's input voltage is sufficient. The relay will activate, allowing us to utilize the 230v charger to charge our phones. The ESP8622 WI-FI module was used to link Arduino to the internet. Because of its simple serial communication connectivity, the ESP8622 WI-FI module can be used as a server, WI-FI adapter, and wireless internet access interface for any micro controller. Our ESP8266 will function as an Access Point (AP Mode). The ESP8622 WI-FI module is used to establish a connection as well as to enable IoT services (cloud computation). The server will send the date and time. The coin acceptor determines if the coin is valid or not after it has been entered.

II. Material And Methods

1.Coin sensor Detector

In this detector we use IR Transmitter & Receiver which are placed in Line of sight. When the coin is inserted it interrupts the IR transmitter & receiver. That interruption is compared with Voltage controlled oscillator if any change occurred in received signal then LM567 (VCO) sends signal to the micro controller which triggers relay.

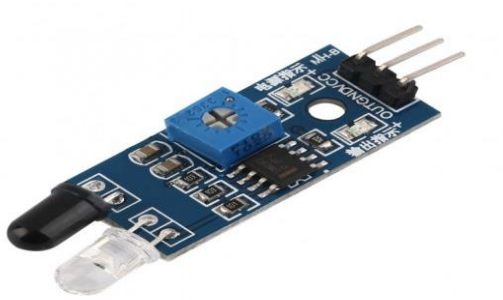

Fig 1 IR Sensor

2 LIQUID CRYSTAL DISPLAY:

Fig 2 LCD Display

A liquid crystal display (LCD) is a thin, flat panel used for electronically displaying information such as text, images, and moving pictures. Its uses include monitors for computers, televisions, instrument panels, and other devices ranging from aircraft cockpit displays, to every-day consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones. Among its major features are its lightweight construction, its portability, and its ability to be produced in much larger screen sizes than are practical for the construction of cathode ray tube (crt) display technology.

Its low electrical power consumption enables it to be used in battery-powered electronic equipment. It is an electronically-modulated optical device made up of any number of pixels filled with liquid crystals and arrayed in front of a light source (backlight) or reflector to produce images in color or monochrome. The earliest discovery leading to the development of lcd technology.

Each pixel of an lcd typically consists of a layer of molecules aligned between two transparent electrodes, and two polarizing filters, the axes of transmission of which are (in most of the cases) perpendicular to each other. With no actual liquid crystal between the polarizing filters, light passing through the first filter would be blocked by the second (crossed) polarizer.

3 Relay

Relay is a switch that open and close circuits electromechanically. Relay control one electrical circuit by opening and closing contacts in another circuit. When the relay circuit detects the undesirable condition with an assigned area and gives the command to the circuit breaker to disconnect the affected area. Thus protects the system form damage.

Fig 3 Relay Board

4 ATMEGA 16

Features

• High-performance, Low-power Atmel® AVR® 8-bit Microcontroller
• Advanced RISC Architecture
– 131 Powerful Instructions – Most Single-clock Cycle Execution
– 32 x 8 General Purpose Working Registers
– Fully Static Operation
– Up to 16 MIPS Throughput at 16 MHz
– On-chip 2-cycle Multiplier
• High Endurance Non-volatile Memory segments
– 16 Kbytes of In-System Self-programmable Flash program memory
– 512 Bytes EEPROM
– 1 Kbyte Internal SRAM
– Write/Erase Cycles: 10,000 Flash/100,000 EEPROM
– Data retention: 20 years at 85°C/100 years at 25°C(1)
– Optional Boot Code Section with Independent Lock Bits
In-System Programming by On-chip Boot Program
True Read-While-Write Operation
– Programming Lock for Software Security
• JTAG (IEEE std. 1149.1 Compliant) Interface
– Boundary-scan Capabilities According to the JTAG Standard
– Extensive On-chip Debug Support
– Programming of Flash, EEPROM, Fuses, and Lock Bits through the JTAG Interface
• Peripheral Features

– Two 8-bit Timer/Counters with Separate Prescalers and Compare Modes
– One 16-bit Timer/Counter with Separate Prescaler, Compare Mode, and Capture Mode
– Real Time Counter with Separate Oscillator
– Four PWM Channels
– 8-channel, 10-bit ADC
8 Single-ended Channels
7 Differential Channels in TQFP Package Only
2 Differential Channels with Programmable Gain at 1x, 10x, or 200x
– Byte-oriented Two-wire Serial Interface
– Programmable Serial USART
– Master/Slave SPI Serial Interface
– Programmable Watchdog Timer with Separate On-chip Oscillator
– On-chip Analog Comparator
• Special Microcontroller Features
– Power-on Reset and Programmable Brown-out Detection
– Internal Calibrated RC Oscillator
– External and Internal Interrupt Sources
– Six Sleep Modes: Idle, ADC Noise Reduction, Power-save, Power-down, Standby and Extended Standby
• I/O and Packages
– 32 Programmable I/O Lines
– 40-pin PDIP, 44-lead TQFP, and 44-pad QFN/MLF
• Operating Voltages
– 2.7V - 5.5V for ATmega16L
– 4.5V - 5.5V for ATmega16

• Speed Grades
– 0 - 8 MHz for ATmega16L
– 0 - 16 MHz for ATmega16
• Power Consumption @ 1 MHz, 3V, and 25°C for ATmega16L
– Active: 1.1 mA
– Idle Mode: 0.35 mA
– Power-down Mode: < 1 µA

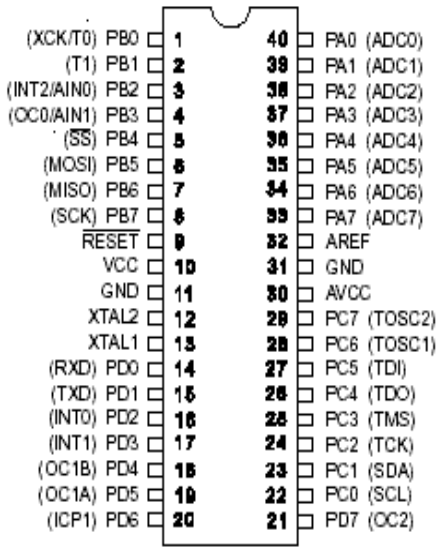

Fig 4 ATMEGA 16

The ATmega16 is a low-power CMOS 8-bit micro controller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega16 achieves throughput approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed The
AVR core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in one single instruction executed in one clock cycle.

The resulting architecture is more code efficient while achieving throughput up to ten times faster than conventional CISC micro controllers. The ATmega16 provides the following features: 16 K bytes of In-System Programmable Flash Program memory with Read-While-Write capabilities, 512 bytes EEPROM, 1 Kbyte SRAM, 32 general purpose I/O lines, 32 general purpose working registers, a JTAG interface for Boundary scan, On-chip Debugging support and programming, three flexible Timer/Counters with compare modes, Internal and External Interrupts, a serial programmable USART, a byte oriented Two-wire Serial Interface, an 8-channel, 10-bit ADC with optional differential input stage with programmable gain (TQFP package only), a programmable Watchdog Timer with Internal Oscillator, an SPI serial port, and six software selectable power saving modes.

The Idle mode stops the CPU while allowing the USART, Two-wire interface, A/D Converter, SRAM, Timer/Counters, SPI port, and interrupt system to continue functioning. The Power-down mode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next External Interrupt or Hardware Reset. In Power-save mode, the Asynchronous Timer continues to run, allowing the user to maintain a timer base while the rest of the device is sleeping. The ADC Noise Reduction mode stops the CPU and all I/O modules except Asynchronous Timer and ADC, to minimize switching noise during ADC conversions. In Standby mode, the crystal/resonator Oscillator is running while the rest of the device is sleeping. This allows very fast start-up combined with low-power consumption. In Extended Standby mode, both the main Oscillator and the Asynchronous Timer continue to run. The device is manufactured using Atmel's high density non-volatile memory technology.

The On chip ISP Flash allows the program memory to be reprogrammed in-system through an SPI serial interface, by a conventional non-volatile memory programmer, or by an On-chip Boot program running on the AVR core. The boot program can use any interface to download the application program in the Application Flash memory. Software in the Boot Flash section will continue to run while the Application Flash section is updated, providing true Read-While-Write operation. By combining an 8-bit RISC CPU with In-System Self-Programmable Flash on a monolithic chip, the ATmega16 is a powerful micro controller that provides a highly-flexible and cost-effective solution to many embedded control applications. The ATmega16 AVR is supported with a full suite of program and system development tools including: C compilers, macro assemblers, program debugger/simulators, in-circuit emulators,and evaluation kits.

III.Result

In this system, we have implemented the simple and hand efficient mobile charger which helps the user, charge their phones during urgent needs. This system is very helpful to the users who are all using mobile phone without charging conditions in public places. This system simple to use and is less expensive. the method of charging mobile batteries of different manufacturer using solar power has been designed for rural and remote areas where the current supply is not at all available all the time. This project is used to help the people by coin-based charger. This project is designed with an IR transmitter and receiver as the sensor for sensing the coin. When the coin is dropped between the transmitter and the receiver, the coin cuts the IR radiation for a second. When the IR rays are interrupted the receiver gives the pulse output to the SCU which is the Signal Conditioning Unit. The Signal Conditioning Unit is nothing but a comparator which compares the input signal with the reference voltage. When the sensor input exceeds the threshold value the comparator gives a high output. The output of the comparator is given to the inverter circuit to invert the pulse from high to low. The low pulse is given to the 555 timers as a trigger input and as soon as the trigger is received by the 555 timer IC the timer gives the output for a pre-determined time. The output of the timer is used to activate the relay for a pre-determined interval. Whenever the relay is activated the charger circuit closes and charges the mobile phone. After the period the

timer deactivates the relay and the charging process is disabled. To charge it again ,the user has to insert another coin. The coin-based smartphone charging controller is implemented here, which is a simple project to control the amount of time your mobile phone charges. With this project, you can connect your phone to the charger, set the time for which your phone charges, and forget about it, as the project will automatically disconnect the power from the charger. This project is very useful for people who tend to charge the phone overnight or for those who often forget that they plugged the phone into the charger.

IV.Discussion

In our work, we have generated the results of a create-and-design research aimed at providing a Coin-based Mobile Charger using ATmega 16 Coin Sensor and relay. This plays a vital role in charging the mobile phones. The sensor has been fabricated for particular type of coin. Once it was fabricated for accepting many types of coins, then it will be very useful and can be implemented in many areas. Furtherly, we can also develop this as revenue generator by implementing GUI application.

V.Conclusion

Our project describes the new way of providing charging services to the public. It would be of less cost because conventional grid power is used and beneficial to the long-distance travellers. This coin-based mobile charging system can be installed at various public places for the convenience of mobile users. The objective of this project is to help mobile users by providing coin-based charging that would be easily available whenever they need it. The Arduino based smartphone charging controller is implemented here, which is a simple project to control the amount of time your mobile phone charges.

With this project, you can connect your phone to the charger, set the time for which your phone charges, and forget about it, as the project will automatically disconnect the power from the charger. This project is very useful for people who tend to charge the phone overnight or for those who often forget that they plugged the phone into the charger. A method of charging mobile batteries of different manufactures has been designed and developed whenever required. This project is very useful in today's life.

Because now days the necessity of communication is very important, so every person having cell phone but every time we cannot carry charger with us. When we are going for long travel, we may forget to carry cell phone charger. This project is used to help the people by coin-based charger. Also, now days because use of internet and smart phones, this kind of project is very useful. Conventional grid power is used for mobile charging hence project is low cost.

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