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Automated lab equipment ordering system using embedded technology

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***Abstract*—The aim of the proposed system is to design an automated wireless equipment ordering system. In the current scenario, students in laboratory sessions collect the components manually from the store room. To overcome this problem in the existing method, automated wireless lab equipment ordering system is introduced. The proposed method consists of a wireless information sharing system between transmitter and receiver side, it is to be implemented using Arduino Uno controller and RF transceiver of 2.4 GHz. Arduino IDE development environment is as software platform used for developing and implementation.**

***Index Terms*—Arduino Uno, RF transceiver,Power supply, Keypad.**

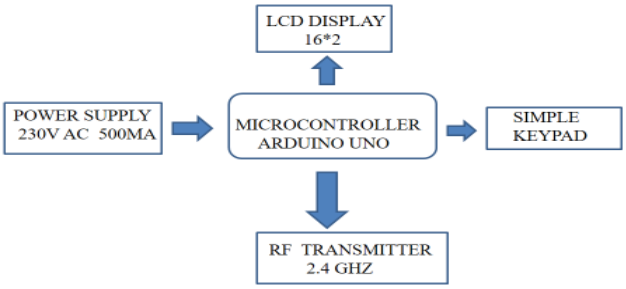
I. INTRODUCTION

Information and communication technology can be used to improve quality and management efficiency in the laboratory. In the current scenario,all the labaratory in the colleges manually get the e.quipments needed for the experiment.It takes more time and there will be some poor maintanence of components .This ordering system used to rectify the negatives of the manual ordering system. In this project ,When switch on the kit the components lists are displayed. Under this choose the required component name .Below this specification of that component will be shown.From that,choose the required specification.After this the quantities of that component will be taken.Atlast send the selected components lists using RF Transeiver.This message will be received in Receiver side .Based the message the components are listed .After that an Acknowledgement is send from the store room to the required desk via RF Transceiver.Routines written inside the controller are easier and user friendly.

II. PROPOSED APPROACH

At present during laboratory session students has to get the components manually.This takes more time and there will not be proper maintenance about the components .There will be chance for missing of components .To overcome problems in the existing method we use automated lab equipment ordering system .This takes less time and there will be proper maintenance of components .There is no chance for missing of components.

III.BLOCK DIAGRAM OF TRANSMITTER



IV.COMPONENTS DESCRIPTION OF TRANSMITTER

POWER SUPPLY:

A power supply is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load. In

this project uses a 230V AC, 50 HZ power supply.This uses step down transformer to covert the 230 v to12v.

LCD DISPLAY:

16*2 LCD display is used to display the messages at transmitter side. It contains 16 columns and 2 rows of display.

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in colour or monochrome.

ARDUINO UNO:

Arduino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button.Arduino is an open source computer hardware and software company, project, and user community that designs manufactures singleboardmicrocontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical and digital world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL),[1] permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself (DIY) kits.

Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards or Breadboards (shields) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) based on the Processing language project.

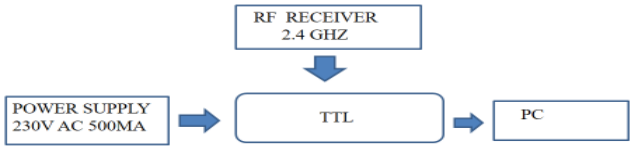
KEYPAD:

Keypad is used to give input to the controller. It contains 5 keys.First key is for up arrow, Second key is for down arrow,Third key is for selecting the components, Four key is for send,Fifth key is for entering the number of quantities.

RF TRANSEIVER:

RF TRANSCEIVER is used to transmit or receive radio signals between two devices. The main application of RF module is an embedded system to communicate with another device wirelessly. This communication may be accomplished through radio frequency communication. For various applications the medium of choice is radio frequency since it does not need line of sight.The applications of RF modules mainly involve in low volume and medium volume products for consumer applications like wireless alarm systems, garage door openers, smart sensor applications, wireless home automation systems and industrial remote controls. This article discusses about block diagram of RF transceiver module and its applications. Frequency range of RF transceiver is 2.4 GHz, and it covers upto 1km.

V.BLOCK DIAGRAM OF RECEIVER



VI.COMPONENTS DESCRIPTION OF RECEIVER

TTL:

The USB TTL Serial cables are a range of USB to serial converter cables which provide connectivity between USB and serial UART interfaces. A range of cables are available offering connectivity at 5V, 3.3V or user specified signal levels with various connector interfaces.

TTL is a *current-sinking logic* since a current must be drawn from inputs to bring them to a logic 0 level. At low input voltage, the TTL input sources current which must be absorbed by the previous stage. The maximum value of this input current is about 1.6 mA for a standard TTL gate. The input source has to be low-resistive enough (<500 Ω) so that the flowing current creates only a negligible voltage drop (<0.4 V) across it, for the input to be considered as a logical "0" (with a 0.4 V "noise margin", see below). The output stage of the most common TTL gates is specified to function correctly when driving up to 10 standard input stages (a fanout of 10). TTL inputs are sometimes simply left floating to provide a logical "1", though this usage is not recommended.

Standard TTL circuits operate with a 5-volt power supply. A TTL input signal is defined as "low" when between 0 V and 0.8 V with respect to the ground terminal, and "high" when between 2 V and V_{CC} (5 V),and if a voltage signal ranging between 0.8 V and 2.0 V is sent into the input of a TTL gate, there is no certain response from the gate and therefore it is considered "uncertain" (precise logic levels vary slightly between sub-types and by temperature). TTL outputs are typically restricted to narrower limits of between 0.0 V and 0.4 V for a "low" and between 2.4 V and V_{CC} for a "high", providing at least 0.4 V of noise immunity. Standardization of the TTL levels is so ubiquitous that complex circuit boards often contain TTL chips made by many different manufacturers selected for availability and cost, compatibility being assured; two circuit board units off the same assembly line on different successive days or weeks might have a different mix of brands of chips in the same positions on the board; repair is possible with chips manufactured years (sometimes over a decade) later than original components. Within usefully broad limits, logic gates can be treated as ideal Boolean devices without concern for electrical limitations. The 0.4V noise margins are adequate because of the low output impedance of the driver stage, that is, a large amount of noise power superimposed on the output is needed to drive an input into an undefined region.

In some cases (e.g., when the output of a TTL logic gate needs to be used for driving the input of a CMOS gate), the voltage level of the "totem-pole" output stage at output logical "1" can be increased closer to V_{CC} by connecting an external resistor between the V_3 collector and the positive rail. It pulls up the V_5 cathode and cuts-off the diode. However, this technique actually converts the sophisticated "totem-pole" output into a simple output stage having significant output resistance when driving a high level (determined by the external resistor).

VII.LITERARY SURVEY:

G. Santosh Kumar, M. AmarnathTouch Screen Based Advanced Menu Ordering System for Restaurants using Raspberry PI.This paper proposes a set of Intelligent and smart ordering system based on Zigbee.

R.V.Patil, Aniruddha Kale, Dineshkumar Pawar, Tejas PatilWireless Customizable Food Ordering System for aRestaurant Using Apriori and K-means Algorithm.This system is customizable system therefore Itcan be customized for the various types of restaurant.

Akash Patil, Rinkesh Kalani, Bhavesh Patil, Sachin Shinde, Prof. S. M. Shedole.Smart Restaurant System Using Android.Smart Restaurant system is compared with earlier traditional methods such as Pen & Paper method and PDA-based system etc.

B. Shabari1, B. Ashok Nayak. Zigbee Based E-menu Ordering System.The implemented system of restaurant menu ordering system is a modern and smart solution for menu ordering methods in any kind of restaurant.

B.Vinodhini, K.Abinaya, R.Roja, M.RajeshwariB.Vinodhini, K.Abinaya, R.Roja, M.RajeshwariThis paper presents a wireless two-way restaurant Ordering system which gathers a number of advantages of existing works and work via touch screens at three different units: customer tables, cook room and main server.

VIII.CONCLUSION:

The automated lab equipment ordering system reduces the time to collect the components in laboratories. An automated wireless lab equipment ordering system has been implemented. The ordering components list could send to the receiving section via wireless communication. The receiver end controller could send the order details to be displayed on the host computer via USB. The data could also be stored electronically using this system. The wireless lab equipment order system achieves the ordering without use of paper. The automated system achieves the digital ordering which can provide more flexibility to users. The digital processing is more efficient. These features can provide more efficiency and systematization and reduces the time and increases the maintanence of components.

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