

An Electronic Menu Using Wireless Communication Network in Restaurants & Hotels

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Abstract:

Development of technology enables people to become more comfortable in most areas of our lives. The restaurant industry is an area, which has remained behind technical advances until recently, when the electronic menu (e-menu) started being used to improve catering services and increase revenue. Nowadays, the e-menu is becoming popular and changing the concept of food ordering by paper-based menus. Utilizing information technology to upgrade the service quality and management efficiency has always been received great concern in information development of catering industry.

A new design scheme of the E-Menu ordering terminal applied to middle and small hotel is proposed. The development of the E-Menu ordering is based on the software-hardware platform on ARM7 (LPC2148), using ZigBee short-range radio communication technologies. It has advantages of high performance-cost ratio, low power, high reliability and friendly user interface. This paper introduces two sections one is hand held device section and other is main section. Both sections consist of ZigBee transceivers. From the first section menu should taken and saved in memory in that section. This information is forwarded to the main section via ZigBee wireless communication. Main section will receive the information from the first section and stores that data in memory.

According to that order which is stored in memory service is provided. Here LCD is used to display the data PC is used to display data and record for billing. ZigBee E-Menu Ordering System can help catering enterprises reduce the costs of human resources, improve work efficiency and leap forward from the external image to the internal service quality. Using wireless modules, can save the development costs. However, the user interfaces are not friendly, input errors easily occurs, and the display is single color. And besides, because of using infrared ray communication, transmission range will be extremely limited. The analysis shows that the scarcity of wireless ordering system for the medium-sized hotels directly leads to promote slowly. Through comparing with different grades of E-Menu ordering systems, the key difference lies in selection of ordering terminal and wireless communication. In this paper, the development of wireless handheld terminal is based on the Software-hardware platform of ARM7 (LPC2148) and, using ZigBee short-range wireless communication technologies.

I. Ease of use:

An embedded system is an application it consist at least one programmable computer that is micro processor either Microcontroller or Digital signal processor a which is performs a specific function ,without human intervention .In this embedded system we have combination of both software and hardware , in this we have hidden software it is not visible But

performs function, when we see embedded devices they are washing machine, micro oven and home automation ,lift etc are embedded applications examples ,here we see the only hard ware components only, the software is hidden in the controller. These embedded reflects many application in our daily life, What is the criteria choosing of embedded application these are working with the less power consumption , save the lot of time and make the human works very smaller this is the reason choosing of embedded systems .We are using controller and processor this can be implementing efficiently and we can easily modified according market requirement. The very simplest embedded systems are have the ability to performing only a single function or set of functions .In our daily life we are mostly using embedded applications these are playing a key role ,the processor and controllers are designed in a such way that application software for a particular purpose.

Proposed system:

The above mentioned traditional menu ordering and catering systems are time consuming and susceptible to human errors which can be reduced but can't be avoided. The problem with the self service ordering system is that self service restaurants are more popular in metro cities. So in smaller cities there are hardly any self service restaurants available. Many a times these self service systems take unreasonable amount of delays to deliver the order. The problem with the recently developed ZigBee based system is its high cost and limited range. Our aim is to develop a cost effective system which could work in small restaurants that are not willing to invest huge amount of money in these systems. The newly suggested system is emphasized on increasing user friendly interface, simple navigation and low cost, increasing service range of wireless communication used and decreasing order processing time



Arm processor overview:

It is extensively used in Advanced Robotic Applications. ARM stands for Advanced Reduce Instruction Set Computer Machines. It is a 32 bit processor core, used for high end application



History and Development:

ARM was develop at Acron Computers ltd of Cambridge, in England during 1983 and 1985.

RISC concept was begin in 1980 at Stanford and Berkley. Advance Risc Machine ltd was found in 1990. ARM cores are licensed to partners so as to develop and fabricate new microcontrollers around same processor cores.

The Arm it has 2.8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip streak memory. 128-

piece wide interface/quicken agent empowers fast 60 MHz operation. 3.In-System Programming/In-Application Programming (ISP/IAP)by means of on-chip boot loader programming. Single blaze area or full chip delete in 400 ms and programming of 256 bytes in 1 ms.

Power Supply:

- In this project we gives the power supply +5v to -5v. when we give the power supply if it Ac supply it can be step down 12V/50Hz using of transformer , after that the bridge rectifier it can be used to convert Ac voltage into dc voltage ,here we are using two capacitor filters remove unwanted Ac pulses. Here the filters blocks Ac current and allows only dc current . After that the power goes to the voltage regulator Lm7805 , it gives the only five voltage to the controller why because the controller working with 5v dc only, If we use the dc supply no need of transformer.

Description:

A transformer is an instrument that changes electrical energy from one path to another path means one circuit to another circuit through the inductively coupled conductors. The varying of current in the primary coil it creates the magnetic flux in the transformer. The varying induces generate electromotive force in the secondary coil. This is effect is called mutual induction.



Figure: Transformer Symbol

Transformer is a device that reducing and increasing of the energy like a transducer.

Switch:

In electronics, an electronic switch is an electronic component or device that can switch an electrical circuit, interrupting the current or diverting it from one conductor to another. Typically, electronic switches use solid state devices such as transistors, though vacuum tubes can be used as well in high voltage applications.



Figure : switch

The mechanism of a switch may be operated directly by a human operator to control a circuit (for example, a light switch or a keyboard button), may be operated by a moving object such as a door-operated switch, or may be operated by some sensing element for pressure, temperature or flow. A relay is a switch that is operated by electricity. Switches are made to handle a wide range of voltages and currents; very large switches may be used to isolate high-voltage circuits in electrical substations.

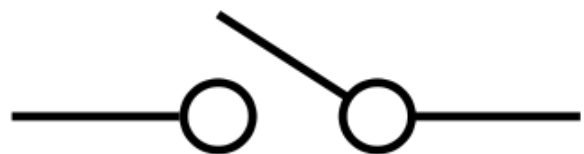


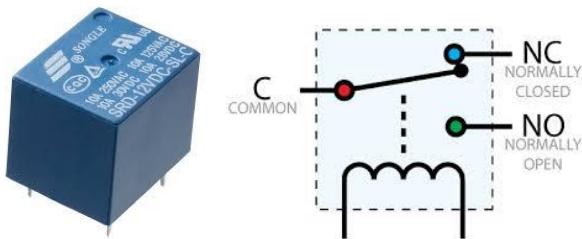
Figure A simple on-off switch

The two terminals are either connected together or disconnected from each other. An example is a light switch.

Relay:

Relays are simple switches, which operated in both ways electrically and mechanically , we know already relays are using in industrial high end applications effectively. Relays are consist of an electromagnet and contacts.

The switching mechanism carried out by the with the help of electromagnet switch. A relay is used to separate one electrical circuit from another. It allows a small current control circuit to make contacts or break an electrically isolate high voltage path. The simple relay consists of a coil and a set of contacts. The most common relay coil is a length of magnet wire envelop around a metal . When the voltages is given to the coil, current passes through the wire and generate a magnetic field. This magnetic field drag the contacts together and holds them there until the current flow in the coil after that when release the switch it is stopped. The below diagram shows the parts of a simple relay.



Relay:

Usage of Relay in its place of switches are a lot of safer, relays can be operate in very low down voltage but it can handle high voltages also and much safer .Switches are only manual operated, easily depreciate . The other form a Relays are contactor & Breakers during power supply it control 400v to 220 kilo volts for these application switches cannot be situated used at all. We know the working of a relay as a remote control switch. It can have one or more set of connections so one relay can become a series of remote controlled switches Single Pole Single Throw relay. Current will only stream throught the connection as the time as the relay coil is enable means when we give the voltage supply it make contact.

Fluid crystal display:

LCD remains for Liquid Crystal Display. LCD is finding across the board use supplanting LEDs (seven portion LEDs or other multi fragment LEDs) on account of the accompanying reasons:

- 1.The declining costs of LCDs.
- 2.The capacity to show numbers, characters and design. This is rather than LEDs, which are constrained to numbers and a couple characters.
- 3.Incorporation of an invigorating controller into the LCD, in this way calming the CPU of the undertaking of reviving the LCD. Interestingly, the LED must be invigorated by the CPU to continue showing the information.
- 4.Ease of programming for characters and illustrations.
- 5.These parts are "particular" for being utilized with the microcontrollers, which implies that they can't be enacted by standard IC circuits. They are utilized for composing diverse messages on a smaller than expected LCD.

A model portrayed here is at its minimal effort and incredible potential outcomes most as often as possible utilized as a part of practice. It depends on the HD44780 microcontroller (Hitachi) and can show messages in two lines with 16 characters each. It shows every one of the letter sets, Greek letters, accentuation marks, numerical images and so on. Furthermore, it is conceivable to show images that client makes up all alone. Programmed moving message in plain view (move left and right), appearance of the pointer, backdrop illumination and so on are considered as helpful qualities.



Pins Functions:

There are pins along one side of the little printed board utilized for association with the microcontroller. There are aggregate of 14 pins checked with numbers (16 on the off chance that the foundation light is implicit). Their capacity is depicted in the table underneath:

TABLE:2

Function Description	Pin Number	Name	Logic	State
Ground 1	Vss	-	0V	
Force supply	2	Vdd	-	+5V
Contrast	3	Vee	-	0 – Vdd
Control of operating	4	RS	0	
1	D0 – D7 are translated as summons			
	D0 – D7 are translated as information			
5	R/W	0		
1	Write information (from controller to LCD)			
	Perused information (from LCD to controller)			
6	E	0		
1	From 1 to 0 Access to LCD debilitated			
	Ordinary working			
	Information/charges are exchanged to LCD			
Information/commands	7	D0	0/1	Bit 0
LSB				
8	D1	0/1	Bit 1	
9	D2	0/1	Bit 2	
10	D3	0/1	Bit 3	
11	D4	0/1	Bit 4	
12	D5	0/1	Bit 5	
13	D6	0/1	Bit 6	
14	D7	0/1	Bit 7	MSB

LCD screen:

LCD screen comprises of two lines with 16 characters each. Every character comprises of 5x7 spot grid. Complexity in plain view relies on upon the force supply voltage and whether messages are shown in maybe a couple lines. Thus, variable voltage 0-Vdd is connected on pin stamped as Vee. Trimmer potentiometer is generally utilized for that reason. A few adaptations of presentations have inherent backdrop illumination (blue or green diodes). At the point when utilized amid working, a resistor for current confinement ought to be utilized (like with any LE diode).

LCD Basic Commands:

All information exchanged to LCD through yields D0-D7 will be translated as charges or as information, which relies on upon rationale state on pin RS:RS = 1 - Bits D0 - D7 are locations of characters that ought to be shown. Implicit processor addresses constructed in "guide of characters" and shows relating images. Showing position is controlled by DDRAM location. This location is either already characterized or the location of beforehand exchanged character is consequently augmented.

To perform time delay capacities. Transfers can be utilized to go about as a mechanical time delay gadget by using so as to control the discharge time the impact of lingering attraction by method for an embeddings copper circle between the armature and moving sharp edge gathering.

Potentiometer:

Variable resistors utilized as potentiometers have each of the three terminals associated. This game plan is regularly used to change voltage, for instance to set the exchanging purpose of a circuit with a sensor, or control the volume (commotion) in an intensifier circuit. In the event that the terminals at the closures of the track are associated over the force supply, then the wiper terminal will give a voltage which can be fluctuated from zero up to the greatest of the supply.

Zigbee:

ZigBee is a specification for a suite of high level communication protocols using small, low-power digital radios based on the IEEE 802.15.4-2003 standard for wireless personal area networks (WPANs), such as wireless headphones connecting with cell phones via short-range radio. The technology defined by the ZigBee specification is intended to be simpler and less expensive than other WPANs, such as Bluetooth. ZigBee is targeted at radio-frequency (RF) applications that require a low data rate, long battery life, and secure networking.

4.12.1 OVERVIEW:

ZigBee is a low-cost, low-power, wireless mesh networking proprietary standard. The low cost allows the technology to be widely deployed in wireless control and monitoring applications, the low power-usage allows longer life with smaller batteries, and the mesh networking provides high reliability and larger range. The ZigBee Alliance, the standards body that defines ZigBee, also publishes application profiles that allow multiple OEM vendors to create interoperable products. The current list of application profiles either published or in the works are:

- Home Automation
- ZigBee Smart Energy
- Commercial Building Automation
- Telecommunication Applications
- Personal, Home, and Hospital Care
- Toys

The relationship between IEEE 802.15.4 and ZigBee is similar to that between IEEE 802.11 and the Wi-Fi Alliance. The ZigBee 1.0 specification was ratified on 14 December 2004 and is available to members of the ZigBee Alliance. Most recently, the ZigBee 2007 specification was posted on 30 October 2007. The first ZigBee Application Profile, Home Automation, was announced 2 November 2007. ZigBee operates in the industrial, scientific and medical (ISM) radio bands; 868 MHz in Europe, 915 MHz in the USA and Australia, and 2.4 GHz in most jurisdictions

worldwide. The technology is intended to be simpler and less expensive than other WPANs such as Bluetooth. ZigBee chip vendors typically sell integrated radios and microcontrollers with between 60K and 128K flash memory, such as the Jennie JN5148, the Free scale MC13213, the Ember EM250, the Texas Instruments CC2430 and the Atmel ATmega128RFA1. Radios are also available stand-alone to be used with any processor or microcontroller. Generally, the chip vendors also offer the ZigBee software stack, although independent ones are also available.

Because ZigBee can activate (go from sleep to active mode) in 15 msec or less, the latency can be very low and devices can be very responsive — particularly compared to Bluetooth wake-up delays, which are typically around three seconds. Because ZigBee can sleep most of the time, average power consumption can be very low, resulting in long battery life. The first stack release is now called ZigBee 2004. The second stack release is called ZigBee 2006, and mainly replaces the MSG/KVP structure used in 2004 with a "cluster library". The 2004 stack is now more or less obsolete.

ZigBee 2007, now the current stack release, contains two stack profiles, stack profile 1 (simply called ZigBee), for home and light commercial use, and stack profile 2 (called ZigBee Pro). ZigBee Pro offers more features, such as multi-casting, many-to-one routing and high security with Symmetric-Key Key Exchange (SKKE), while ZigBee (stack profile 1) offers a smaller footprint in RAM and flash. Both offer full mesh networking and work with all ZigBee application profiles.

ZigBee 2007 is fully backward compatible with ZigBee 2006 devices: A ZigBee 2007 device may join and operate on a ZigBee 2006 network and vice versa. Due to differences in routing options, ZigBee Pro devices must become non-routing ZigBee End-Devices (ZEDs) on a ZigBee 2006 or ZigBee 2007 network, the same as ZigBee 2006 or ZigBee 2007 devices must

become ZEDs on a ZigBee Pro network. The applications running on those devices work the same, regardless of the stack profile beneath them.

Uses:

ZigBee protocols are intended for use in embedded applications requiring low data rates and low power consumption. ZigBee's current focus is to define a general-purpose, inexpensive, self-organizing mesh network that can be used for industrial control, embedded sensing, medical data collection, smoke and intruder warning, building automation, home automation, etc. The resulting network will use very small amounts of power — individual devices must have a battery life of at least two years to pass ZigBee certification.

About keil software:

KEIL is a software which is used to create the code and that is based on the C programming . Here mainly the purpose of KEIL software is to create a .c file and also for the creation of the hex file , by the use of .c file is the source code which can be used for the main code. And coming to the Hex file it is mainly used for the dumping into the hardware. And run the compiler on each C source file, and also specifying the list of controllers . Here one more thing is that for the selection of the controller also it is mainly using this KEIL software. It can run the library manager or linker. Hex file is main source for the hardware because it is download to the target h/w and debugging. It is used to create a source file to create the .c file. Mainly the compiling is going in the KEIL software they are translate ,burn and Reburn these three main compiling buttons which can be used to compile the program.

PROJECT:

To build a single application a project is list of all source files required. Here KEIL centers on projects ,all the tools in the KEIL are used to support how to apply the tool depends on the selected program. For every project contains the set source files and

instructions, and they exactly the binary code for the application required. The degree flexibility required from specific manner. For loading the project file to the KEIL which the source files are required. Therefore they are stored in a project file. Whenever we are going to write the program we need to do are repeat the same steps ,because by using this only all the programs that they are running. Repeat to all the programs.

Debugger and simulator:

Debugger and simulator can work both the very detailed execution of a micro controller with external signals. It can used to execute for the prescribed time of a assembly instruction ,or by using the single line C code source code .these are all used for the entire application and to perform the task that can be used for the particular task .Lines of C code and executions it may be stepped through in single instruction or c line at single time .the memory areas are viewed with some ability along to find specific variables. In present the register may be viewed allowing detailed for what microcontroller is doing at any point in single time .Mainly in this KEIL 8051 developing tools and they are listed for the program to compile in the source code. And by arranging the code files in a programmed way. To create Hex file and for the debugging the target program, micro μ Vision2 is for the OS that can be used to get the keil4 and also keil3 like this we are having the different version but coming to the 8051 the keil that we are using is the KEIL4 and is called micro vision .here in this we are editing programming project management .

- Here in this C51 KEIL ANSI creates and relocate object module from c source code.
- And coming to the A51 macro version, object modules are taken from the 8051 assembler source code .
- And BL51 locater and linker,they are created by the compiler and final absolute module will be assembled.

What is the new in micro vision?

It is used for the text compiler templates ,fast navigation function and coloring of syntax with high lighting compared to micro3 micro2 is compatible.

What is the micro vision 3?

It is an IDE that which can be used help us write. And compile debug the embedded program.

- ❖ Project manager
- ❖ Making facility
- ❖ Configuration of tool
- ❖ Editable
- ❖ And debugger
- ❖ For analog and digital systems measure

Creating the steps of (micro) vision

1. Open the keil icon
2. Go to top tool kit in that go to project
3. Click on the project with right click then we can see the open new project option
4. Select a folder for saving the project in that with name of the project.
5. Later go to select the controller
6. Go for Atmel in that we can see
7. Particular controller
8. The later select new file for writing the code
9. After completion of the program save it
10. Then we can see a new window which is used save the in to the .C file
11. Whatever the name u have given before creating folder with the program or project
12. Same with that name only we need to add the .c file
13. Coming to the target take a click beside it.
14. Coming to source group and double click on that
15. Add the .c file and translate and check the errors
16. In this way we can compile

Debugging :

- ❖ Go to debug option which is above
- ❖ Start /stop option we can see debug session
- ❖ Click on the start button in single press or click ,so it will goes to debugging mode and starts
- ❖ The ouput windows execute to the main c function.

Debug your program click go through and so on ...

Creation of project:

The micro vision is standard window application starting with click on the icon and the it can started New project window. Same as above steps.,

Building Projects and Creating a HEX Files

You may translate all source files and line the application When you build an application with syntax errors, µVision2 will display errors.

Creation hex file:

After completion of the compiling the program or executing the code without any errors then we need to for the hex file creation. So to create hex file we to go to the target button which is at the left side of the window. When we click on to that button we can see target button again so need to click on that window we will get the new window In this window go to the frequency setting and later goto the output window at the top. So by using this we can now click on the hex file button which shows below window and later go to the save options. this is how we can create the hex file. window with the source text or shows CPU instructions in the disassembly window. Here now total can be used for finding the commands or correct program errors. The steps of the can be see in the below slides which are used to to get the idea how the process is going on. they taken in the following steps .

Future scope:

The proposed system will help in reducing the number of staffs used in the restaurants hence will help in considerably reducing cost of restaurant management.

It will also minimize manual service given by waiters and serving staff, thus eliminating the human mistakes. It can also help in reducing child labor problem, which is a huge problem in countries like India. The system can also extend using smart card technology through which the bill payment can be done based on the smart ATM debit or credit-cards directly. The printer can directly issue bills to the customers at tables only.

Conclusion:

The project has been successfully designed and tested. Integrating features of all the hardware components used have developed it. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced IC's and with the help of growing technology the project has been successfully implemented. In this paper, a high performance-cost ratio wireless handheld ordering terminal is proposed, which is based on the hardware platform of ARM7, and ZigBee wireless communication technology. The ordering terminal has the advantages of simple structure, stable operation, low power consumption

and friendly interface, thus it has bright market prospect.

Reference:

- [1] A. El-Sawah, N. Georganas, and E. Petriu, "A model for 3-D handtracking and motion estimation," *IEEE Trans. Instrum. Meas.*, vol. 57, no. 8, pp. 1627–1636, Aug. 2008.
- [2] D. G. Lowe, "Particular picture highlights from scale-invariant keypoints," *Int. J. Comput. Vis.*, vol. 60, no. 2, pp. 91–110, Nov. 2004.
- [3] A. Bosch, X. Munoz, and R. Marti, "Which is the most ideal approach to sort out/group pictures by substance?" *Image Vis. Comput.*, vol. 25, no. 6, pp. 778–791, Jun. 2007.
- [4] H. Zhou and T. Huang, "Following verbalized hand movement with Eigen flow examination," in *Proc. Int. Conf. Comput. Vis.*, 2003, vol. 2, pp. 1102–1109.
- [5] B. Stenger, "Layout based hand posture acknowledgment utilizing different signals," in *Proc. seventh ACCV*, 2006, pp. 551–560.