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Intelligent Household Led Light System

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ABSTRACT:- Saving energy has become one of the most important issues these days. The most waste of energy is caused by the inefficient use of the consumer electronics. Particularly, a light accounts for a great part of the total energy consumption. Various light control systems are introduced in current markets, because the installed lighting systems are outdated and energy-inefficient. However, due to architectural limitations, the existing light control systems cannot be successfully applied to home and office buildings. Therefore, this paper proposes an intelligent household LED lighting system considering energy efficiency and user satisfaction. The proposed system utilizes multi sensors and wireless communication technology in order to control an LED light according to the user's state and the surroundings. The proposed LED lighting system can autonomously adjust the minimum light intensity value to enhance both energy efficiency and user satisfaction.

PROPOSED SYSTEM

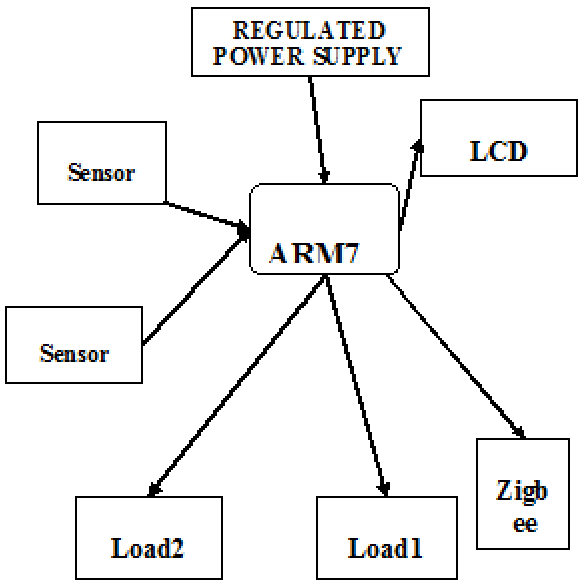
All things considered, design goals of the new intelligent lighting control system are as follows:

- The intelligent lighting control system should be designed to maximize the utilization of an LED.
- The intelligent lighting control system should be designed to have the communication capability.
- The intelligent lighting control system should be designed to control based on the situation awareness.
- The intelligent lighting control system should be designed to enhance both energy efficiency and user satisfaction.
- The intelligent lighting control system should be designed for the security purpose.
- Therefore, this paper proposes an intelligent household LED lighting system considering energy

efficiency and user satisfaction. The proposed system utilizes multi sensors and wireless communication technology in order to control an LED light according to the user's state and the surroundings. The proposed LED lighting system can autonomously adjust the minimum light intensity value to enhance both energy efficiency and user satisfaction.

BLOCKDIAGRAM

Transmitter



Receiver

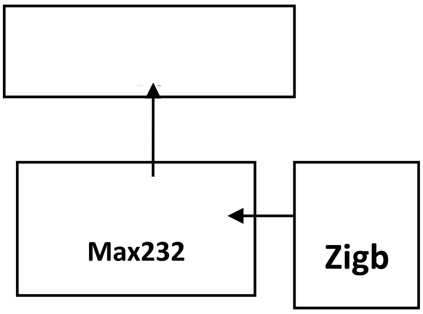


Figure:2.1 Block diagram

Criteria Of Choosing A Micro Controller

1. The first and foremost criterion for choosing a microcontroller is that it must meet task at hands efficiently and cost effectively. In analyzing the needs of a microcontroller based project we must first see whether it is a 8-bit, 16-bit or 32-bit microcontroller and how best it can handle the computing needs of the task most effectively. The other considerations in this category are:
    a. Speed: The highest speed that the microcontroller supports.
    b. Power consumption: This is especially critical for battery-powered products.
    c. The amount of the RAM and ROM on chip.
    d. Packing: Is it 40-pin DIP or QPF or some other packaging format?
        i. This is important in terms of space, assembling and prototyping the end product.
    e. The number of I/O pins and timers on the chip.
    f. How easy it is to upgrade to higher-performance or lower-power consumption versions.
    g. Cost per unit: This is important in terms of final product in which a microcontroller is used.
2. The second criteria in choosing a microcontroller are how easy it is to develop product around it. Key considerations including the availability of an assembler, debugger, a code efficient 'C' language compiler, emulator, technical support and both in house and outside expertise. In many cases third party vendor support for chip is required.
3. The third criteria in choosing a microcontroller is it readily available in needed quantities both now and in future.

Features Of Lpc2148 (Arm7) Architecture

- 16-bit/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package
- 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip flash memory; 128-bit wide interface/accelerator enables high-speed 60 MHz operation
- In-System Programming/In-Application Programming (ISP/IAP) via on-chip boot loader software, single flash sector or full chip erase in 400 ms and programming of 256 B in 1 ms.
- Embedded ICE RT and Embedded Trace interfaces offer real-time debugging with the on-chip Real Monitor software and high-speed tracing of instruction execution
- USB 2.0 Full-speed compliant device controller with 2 kB of endpoint RAM.
- In addition, the LPC2146/48 provides 8 kB of on-chip RAM accessible to USB by DMA
- One or two (LPC2141/42 vs, LPC2144/46/48) 10-bit ADCs provide a total of 6/14 analog inputs, with conversion times as low as 2.44 ms per channel Single 10-bit DAC provides variable analog output (LPC2142/44/46/48 only)
- Two 32-bit timers/external event counters (with four capture and four compare channels each), PWM unit (six outputs) and watchdog.
- Low power Real-Time Clock (RTC) with independent power and 32 kHz clock input
- Multiple serial interfaces including two UARTs (16C550), two Fast I2C-bus (400 kbit/s), SPI and SSP with buffering and variable data length capabilities

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- Vectored Interrupt Controller (VIC) with configurable priorities and vector addresses
- Up to 45 of 5 V tolerant fast general purpose I/O pins in a tiny LQFP64 package
- Up to 21 external interrupt pins available
- 60 MHz maximum CPU clock available from programmable on-chip PLL with settling time of 100 ms
- On-chip integrated oscillator operates with an external crystal from 1 MHz to 25 MHz
- Power saving modes include Idle and Power-down
- Individual enable/disable of peripheral functions as well as peripheral clock scaling for additional power optimization
- Processor wake-up from Power-down mode via external interrupt or BOD
- Single power supply chip with POR and BOD circuits: CPU operating voltage range of 3.0 V to 3.6 V (3.3 V ± 10 %) with 5 V tolerant I/O pads.
- We also use RS = 0 to check the busy flag bit to see if the LCD is ready to receive information. The busy flag is D7 and can be read when R/W =1 and RS = 0, as follows: if R/W =1, RS =0. When D7 = 1(busy flag = 1), the LCD busy taking care of internal operations and will not accept any new information. When D7 = 0, the LCD is ready to receive new information. Note: It is recommended to check the busy flag before writing any data to the LCD.

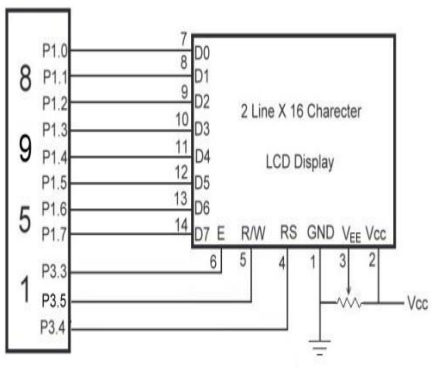

Figure No:2.7 Interfacing LCD to 8951

Protocols

The protocols build on recent algorithmic research (Ad-hoc On-demand Distance Vector, neuRFon) to automatically construct a low-speed ad-hoc network of nodes. In most large network instances, the network will be a cluster of clusters. It can also form a mesh or a single cluster. The current profiles derived from the ZigBee protocols support beacon and non-beacon enabled networks.

In non-beacon-enabled networks (those whose beacon order is 15), an unslotted CSMA/CA channel access mechanism is used. In this type of network, ZigBee Routers typically have their receivers continuously active, requiring a more robust power supply. However, this allows for heterogeneous networks in which some devices receive continuously, while others only transmit when an external stimulus is detected. The typical example of a heterogeneous network is a wireless light switch: The ZigBee node at the lamp may receive constantly, since it is connected to the mains supply, while a battery-powered light switch would remain asleep until the switch is thrown. The switch then wakes up, sends a command to the lamp, receives an acknowledgment, and returns to sleep. In such a network the lamp node will be at least a ZigBee Router, if not the ZigBee Coordinator; the switch node is typically a ZigBee End Device.

In beacon-enabled networks, the special network nodes called ZigBee Routers transmit periodic beacons to confirm their presence to other network nodes. Nodes may sleep between beacons, thus lowering their duty cycle and extending their battery life. Beacon intervals may range from 15.36 milliseconds to 15.36 ms * 2^{14} = 251.65824 seconds at 250 kbit/s, from 24 milliseconds to 24 ms * 2^{14} = 393.216 seconds at 40 kbit/s and from 48 milliseconds to 48 ms * 2^{14} = 786.432 seconds at 20 kbit/s. However, low duty cycle operation with long beacon intervals requires precise timing, which can conflict with the need for low product cost.

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HARDWARE IMPLEMENTATION

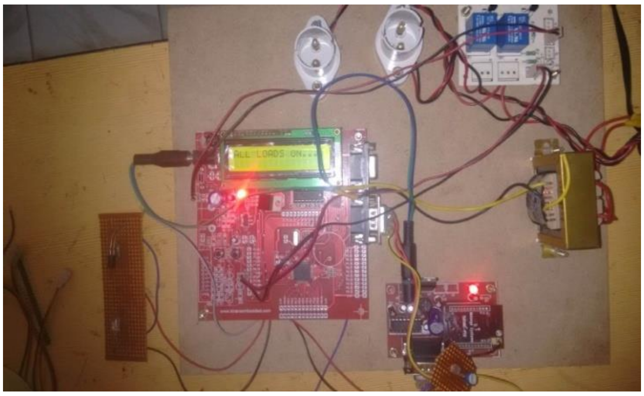


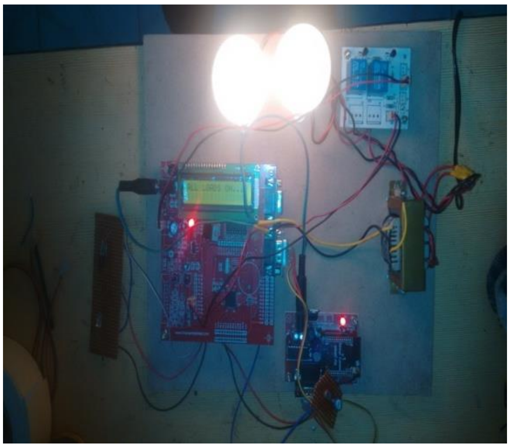
Figure No17. Hardware kit

The module are connected with power supply

1. The light must be focused on the LDR then the 2 loads gets OFF
2. Now the controlling will be activated
3. The output is displayed n LCD and PC with the help zigbee as loads are OFF
4. The control is done by keyboard with keys 3,4,8,9.
5. 3-load1 is OFF,4-load2 is OFF,8-load1 is ON,9-load is ON.
6. The IR sensor gives the alert when an obstacle interrupts.

The connections are given from LDR and IR sensor to ARM and then to relays, the relay makes connections to loads. The arm sends signal to zigbee transmitter the receiver displays the controlling output in PC.

RESULT AND DISCUSSION



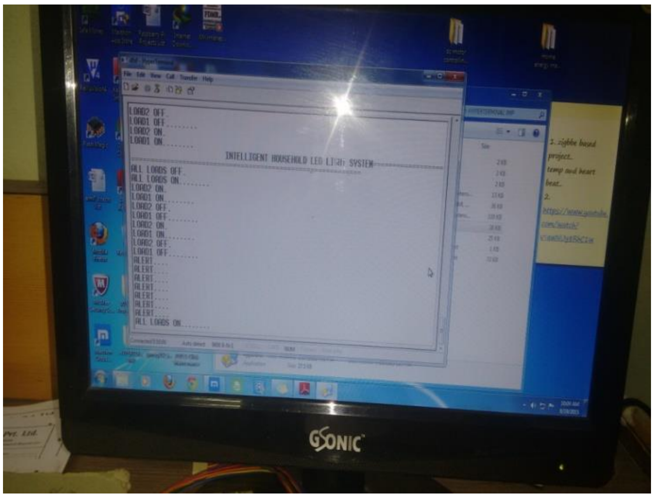


Figure No.3.18output

This project demonstrates about automatic control of light system with efficient energy utilization and to maximize the utilization of an LED. The new intelligent lighting control system is designed to enhance both energy efficiency and user satisfaction.

CONCLUSION

The project "**INTELLIGENT HOUSEHOLD LED LIGHT SYSTEM**" has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. 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.

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