5.2 Observation 1

Figure 5: PIR Detected at 5% of Intensity and LED utilizes complete energy

5.3 Observation 2

Figure 6: PIR Detected at 51% of Intensity and LED utilizes 50% energy

5.4 Observation 3

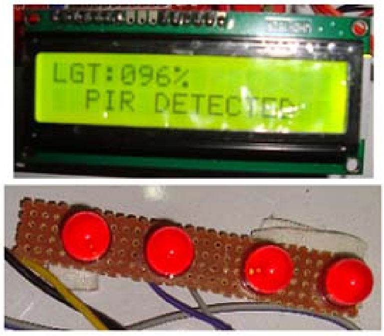

Figure 7: PIR Detected at 96% of Intensity and LED utilizes negligible energy

5.5 Terminal Output

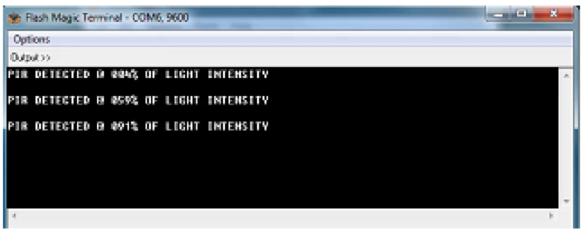

Figure 8: Flash Magic terminal output

5.6 Dropbox Auto-Synchronization

Figure 9: Dropbox Folder

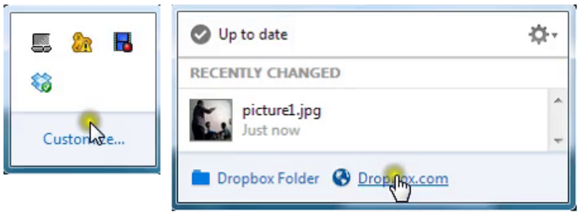

Figure 10: Dropbox Quick Launch

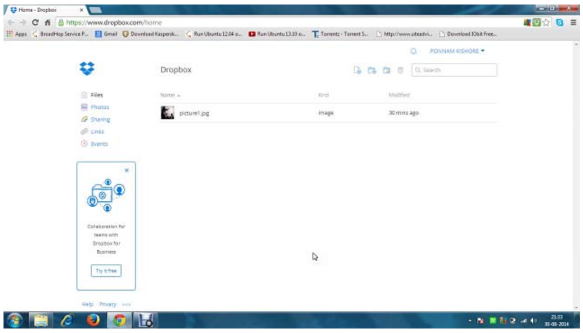

Figure 11: Dropbox(Cloud Storage) account

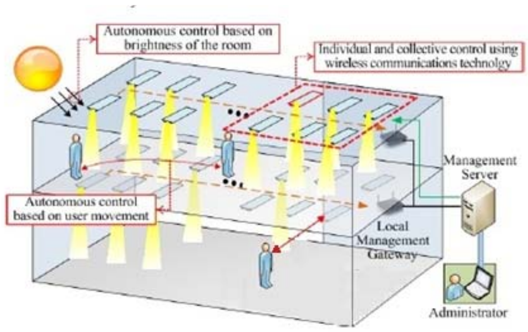

Figure 12: Over view of proposed system

6. Controller

The ARM7TDMI-S is a general purpose 32-bit microprocessor, which offers high performance and very low power consumption.

The ARM architecture is based on Reduced Instruction Set Computer (RISC) principles, and the instruction set and related decode mechanism are much simpler than those of micro-programmed Complex Instruction Set Computers (CISC). This simplicity results in a high instruction throughput and impressive real-time interrupt response from a small and cost-effective processor core. Pipeline techniques are employed so that all parts of the processing and memory systems can operate continuously. Typically, while one instruction is being executed, its successor is being decoded, and a third instruction is being fetched from memory. The ARM7TDMI-S processor also employs a unique architectural strategy known as Thumb, which makes it ideally suited to high-volume applications with memory restrictions, or applications where code density is an issue. The key idea behind Thumb is that of a super-reduced instruction set.

Essentially, the ARM7TDMI-S processor has two instruction sets:
• The standard 32-bit ARM set.
• A 16-bit Thumb set

6.1 AT89S52

- 4K Bytes of Re-programmable Flash Memory
- RAM is 128 bytes.
- 2.7V to 6V Operating Range
- Two-level Program Memory Lock
- 32 Programmable I/O Lines
- Six Interrupt Sources
- Programmable Serial UART Channel
- Low-power Idle and Power-down Modes

The limitations of AT89S51/52 can be observed as

- 4 Kb program memories is not much at all.
- 128Kb RAM (including SFRs as well) satisfies basic needs
- 4 ports having in total of 32 input/output lines are mostly enough to make connection to peripheral environment and are not luxury at all.

As it is shown on the previous picture, the 8051 microcontroller have nothing impressive at first sight. The whole configuration is obviously envisaged as such to satisfy the needs of most programmers who work on development of automation devices. One of advantages of this micro-controller is that nothing is missing and nothing is too much. In other words, it is created exactly in accordance to the average user‘s taste and needs. So we are here enhancing to ARM7 which has the greater advantage than the other.

7. Light Emitting Diode

A light-emitting diode (LED) is a semiconductor diode that emits light when an electrical current is applied in the forward direction of the device, as in the simple LED circuit. The effect is a form of electroluminescence. Where incoherent and narrow-spectrum light is emitted from the p-n junction.

LEDs are widely used as indicator lights on electronic devices and increasingly in higher power applications such as flashlights and area lighting. An LED is usually a small area (less than 1 mm^2) light source, often with optics added to the chip to shape its radiation pattern and assist in reflection.

8. Light Emitting Diode

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

9. Passive Infrared Sensor

A Passive InfraRed sensor (PIR sensor) is an electronic device that measures infrared (IR) light radiating from objects in its field of view. PIR sensors are often used in the construction of *PIR*-based motion detectors. Apparent motion is detected when an infrared source with one temperature, such as a human, passes in front of an infrared source with another temperature, such as a wall.

All objects emit what is known as black body radiation. It is usually infrared radiation that is invisible to the human eye but can be detected by electronic devices designed for such a purpose. The term passive in this instance means that the PIR device does not emit an infrared beam but merely passively accepts incoming infrared radiation. “Infra” meaning below our ability to detect it visually, and “Red” because this color represents the lowest energy level that our eyes can sense before it becomes invisible. Thus, infrared means below the energy level of the color red, and applies to many sources of invisible energy.

10. CDS Sensor

Wireless ad hoc and sensor networks (WSNs) often require a Connected Dominating Set (CDS) as the underlying virtual backbone for efficient routing. Nodes in a CDS have extra computation and communication load for their role as dominator, subjecting them to an early exhaustion of their battery. A simple mechanism to address this problem is to switch from one CDS to another fresh CDS, rotating the active CDS through a disjoint set of CDSs. This gives rise to the connected domatic partition (CDP) problem, which essentially involves partitioning the nodes V(G) of a graph G into node disjoint CDSs. We have developed a distributed algorithm for constructing the CDP using our maximal independent set (MIS)-based proximity heuristics, which depends only on connectivity information and does not rely on geographic or geometric information.

11. Zigbee

The focus of network applications under the IEEE 802.15.4 / ZigBee standard include the features of low power consumption, needed for only two major modes (Tx/Rx or Sleep), high density of nodes per network, low costs and simple implementation.

These features are enabled by the following characteristics,

- *2.4GHz* and *868/915 MHz dual PHY* modes. This represents three license-free bands: 2.4-2.4835 GHz, 868-870 MHz and 902-928 MHz. The number of channels allotted to each frequency band is fixed at sixteen (numbered 11-26), one(numbered 0) and ten (numbered 1-10) respectively. The higher frequency band is applicable worldwide, and the lower band in the areas of North America, Europe, Australia and New Zealand
- Low power consumption, with battery life ranging from months to years. Considering the number of devices with remotes in use at present, it is easy to see that more numbers of batteries need to be provisioned every so often, entailing regular (as well as timely), recurring expenditure. In the ZigBee standard, longer battery life is achievable by either of two means: continuous network connection and slow but sure battery drain, or intermittent connection and even slower battery drain.
- Maximum data rates allowed for each of these frequency bands are fixed as 250 kbps @2.4 GHz, 40 kbps @ 915 MHz, and 20 kbps @868 MHz. High throughput and low latency for low duty cycle applications (<0.1%). Channel access using Carrier Sense Multiple Access with Collision Avoidance (CSMA - CA).

12. Conclusion

The existing light control systems cannot be successfully applied to home and office buildings due to energy-inefficiency. This proposed system utilizes multi sensors and wireless communication technology in order to control an LED light according to the user's state and autonomously adjust the minimum light intensity value to enhance both power and energy efficiently with security and also reduces total power consumption approximately 21.9%.

13. Future Scope

In Future, this LED Lighting System can be much more efficient than all other existing system with low cost. And can be remotely controlled by using smart phones as well, and also it saves more power in our daily life with advance security.

References

[1] J. Byun and S. Park, "Development of a self-adapting intelligent system for building energy saving and context-aware smart services," IEEE Trans. on Consumer Electron., vol. 57, no. 1, pp. 90-98, Feb. 2011.

[2] J. Han, C.-S. Choi, and I. Lee, "More efficient home energy management system based on ZigBee communication and infrared remote controls," IEEE Trans. on Consumer Electron., vol. 57, no. 1, pp. 85-89, Feb. 2011.

[3] S. Tompros, N. Mouratidis, M. Draaijer, A. Foglar, and H. Hrasnica, "Enabling applicability of energy saving applications on the appliances of the home environment," IEEE Network, vol. 23, no. 6, pp. 8-16, Nov.-Dec. 2009.

[4] Tao Chen, Yang Yang, Honggang Zhang, Haesik Kim, and K. Horneman, "Network energy saving technologies for green wireless access networks," IEEE Wireless Communications, vol. 18, no. 5, pp. 30-38, Oct. 2011.

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