PERFORMANCE ANALYSIS OF ZIG BEE MODULE

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ABSTRACT:

Communication is the exchange and flow of information and ideas from one person to another; it involves a sender transmitting an idea, information, or feeling to a receiver. Effective communication occurs only if the receiver understands the exact information or idea that the sender intended to transmit. Many of the problems that occur in an organization are the either the direct result of people failing to communicate and/or processes, which leads to confusion and can cause good plans to fail.

Keyword*:* Energy consumption, mesh routing recovery time, multi-hop, network throughput, wireless sensor network, ZigBee

I. INTRODUCTION

The advantages of using a wireless network are: using less energy, no need for hardwiring, and high transmission distance IEEE Std 802.15.4 defines the physical layer (PHY) and medium To resolve this problem, a wireless sensor network can be implemented to help in data access control (MAC) sublayer specifications for low-data-rate wireless connectivity with fixed, portable, and moving devices with no battery or very limited battery consumption requirements typically operating in the personal operating space (POS) of 10 m. It is foreseen that, depending on the application, a longer range at a lower data rate may be an acceptable tradeoff. The IEEE 802.15.4 standard (2003) defines the device types that can be used in a LR-WPAN which are Full Functional Device (FFD) and Reduced Functional Device (RFD). The RFD can be used in simple applications in which they do not need to transmit large amounts of data and they have to communicate only with a specific FFD. The IEEE 802.15.4 covers the physical layer and the MAC layer of low-rate WPAN. ZIGBEE is a wireless network protocol specifically designed for low data rate sensor and control networks.

II. ANALYSIS OF ZIG BEE

ZigBee is the only standards-based wireless technology designed to address the unique needs of low-cost, low-power wireless sensor and control networks in just about any market. Since ZigBee can be used almost anywhere, is easy to implement and needs little power to operate, the opportunity for growth into new markets, as well as innovation in existing markets, is limitless. Here are some facts about ZigBee:

- With hundreds of members around the globe, ZigBee uses the 2.4 GHz radio frequency to deliver a variety of reliable and easy-to-use standards anywhere in the world.

- Consumer, business, government and industrial users rely on a variety of smart and easy-to-use ZigBee standards to gain greater control of everyday activities.

- With reliable wireless performance and battery operation, ZigBee gives you the freedom and flexibility to do more.

- ZigBee offers a variety of innovative standards smartly designed to help you be green and save money.

III. ZIG BEE CHARACTERISTICS

The ZIGBEE (IEEE 802.15.4) is a new technology that permits the implementation of Wireless Personal Area Networks (WPAN). It is very suitable for wireless sensor networks due to the very low power consumption. This was one of the reasons why it was choose for the implementation of the system presented in this paper. Summarizing, the main advantages of ZIGBEE in comparison with other technologies such Bluetooth or Wi-Fi are the following:

- flexible network architecture;

- Low cost.

- Low power consumption.

- Large number of nodes (≤ 65.536);

- Compatibility of equipments from producers;

The main disadvantages are:

- Low transmission speed.

- The existence of a single point of failure represented by ZIGBEE coordinator. The ZIGBEE technology allows the operation in so called mesh networks that are low cost, self organizing networks of ZIGBEE devices. The components of the mesh networks can operate over extended periods of time, even years, without changing the original battery. The ZIGBEE devices operate in unlicensed radio frequency bands (ISM). These unlicensed bands are not the same in all regions of the world, those the ZIGBEE devices can operate in three frequency bands centered on 868, 915 and 2400MHz. The most advantageous frequency band is at 2400MHz because of higher data rate (250kb/s) and the worldwide availability. In the 2402–2480 MHz frequency band is used offset phase-shift keying (O-QPSK) modulation technique. In the 868 and 902-928 frequency bands are used DSSS (Direct sequence spread spectrum) and BPSK (Binary phaseshift keying). The use of O-QPSK and BPSK minimize power consumption and reduce complexity.

In the structure of ZIGBEE networks the devices can be of tree types:

- ZIGBEE Coordinator,

- ZIGBEE Router,

- ZIGBEE End Device.

ZIGBEE Coordinator (ZC) has the function to initiate the network structure by configuring the channels and establishing an ID for that network. It stores the security keys and is capable to bridge to the networks.

ZIGBEE Router (ZR) act as an intermediate device, its main function is to participate in multihop mesh routing of network messages. It maintains a routing table and manages local address allocation.

ZIGBEE End Device (ZED) does not participate in routing. It contains only the functionality to communicate with its parent node.

IV. CONCLUSION

This device may be used as a short range chat equipment for near distance .communications. This device is only have a range of up to 800 metres. This device communicate on a free frequency 2.4 GHz and defined for a IEEE 802.15.4 And it is a free of cost services. This frequency allotted free for general purpose use and can be used for a enhanced communications.

V. REFERENCES

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