

A Study on-the Wireless Technology

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ABSTRACT: A moment thought about radio broadcast or mobile telephone one can readily appreciate the benefits of wireless communications. There are three basic reasons for adopting a new technology: 1) To save money, 2) To increase the reliability or safety of existing applications and 3) To expand the types of applications that are available to end users. Serial to wireless device servers save users money by reducing cabling cost and since fewer cables are required when using wireless, reliability and safety are The another name of wireless technology standard for connecting devices, set to replace cables is Bluetooth technology. Bluetooth technology allows communicating and exchanging data within various portable and stationary electronic devices by means of radio frequencies; replacing the physical connections. Bluetooth uses radio waves in 2.4GHz band ; therefore no line of sight is required between the communicating devices. Bluetooth works in confined area of 10-15 meters, which can be increased up to 100 meters by increasing power. Bluetooth supports both point to point (piconet) and point to multipoint (scatternet) connections. It uses spread spectrum frequency hopping technology, which eliminates the interference issues.

KEYWORDS: Bluetooth technology, broadcast, wireless technology.

I.INTRODUCTION

There are lot of different ways that electronic devices can connect to one another for e.g.: component cables, electrical wires, Ethernet cables, infrared signals. When we use computers, entertainment systems or telephones the various pieces and parts of the system make a community of electronic devices. The art of connecting things is becoming more and more complex every day. The method of connecting devices called Bluetooth is wireless and automatic. It makes easy to connect a laptop with other electronic devices. Bluetooth is a standard created by a group of electronics manufacturers called Bluetooth Special Interest Group (SIG), and it describes a 1Mbps, 2.4 GHz radio frequency link that reaches approximately 30 feet. By installing a Bluetooth module, electronic devices will be able to communicate with each other through this radio frequency link without the need for cables or wires. Bluetooth technology uses a fast acknowledgment and frequency-hopping scheme to avoid interference from other signals.

II.WHAT IS BLUETOOTH

Bluetooth is a technical standard and specification for speedy and simple wireless communication between the digital devices; using short-range radio links. Bluetooth eliminates need for numerous and inconvenient cable attachments for connecting the devices, enabling the user to interface a wide range of computing and telecommunications devices easily and simply. Bluetooth is a standard for wireless communication between devices in personal area network (PAN) using radio frequency for short range. So any two devices, when they follow the standard, will be allowed to exchange the data between them.

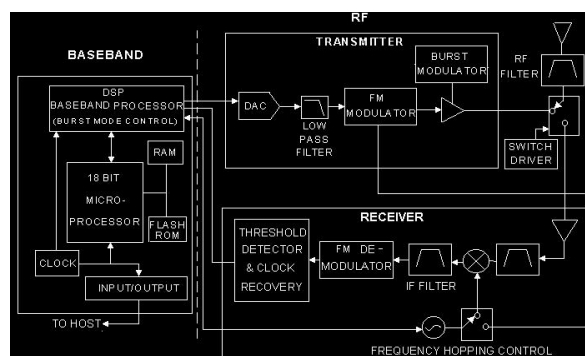


Fig.1 Basic block diagram of Bluetooth

FEATURES:

1. Bluetooth operates on the globally-available radio band, 2.45 GHz, which has been set aside by international agreement for the use of industrial, scientific and medical services (ISM).
2. It supports data speeds of up to 721 Kbps, as well as three voice channels.
3. Bluetooth works at very weak wattage level of 1 milliwatt, such a weak signal is hard for other devices to pick up, so the interference issue gets minored.
4. As it uses radio frequencies, no line of sight is required between the communicating devices.
5. It works in small confined area of 10 – 15 meters, but the range can be increased up to 100 meters by increasing power.
6. Bluetooth supports not only point-to-point connections but also point-to multipoint connections.
7. Designed to operate in a noisy radio frequency environment, Bluetooth uses a technique called ‘spread – spectrum frequency hopping’.

III. WORKING OF BLUETOOTH TECHNOLOGY

The use of frequency hopping and concept of personal area network , makes the system robust. To explain the working we will take a mobile handset and a telephone set. The mobile and telephone set are having a Bluetooth modules in each of them and form a piconet. The mobile has been programmed with an address that falls into a range of addresses it has established for telephone set. When the mobile is turned ON, it sends radio signals asking for a response from any units with an address in particular range. As the telephone set has an address in the range it responds and a piconet is formed. Once the network is established the systems begin talking among themselves. So we can divert the calls on mobile to the telephone set and vice versa. Any of the two devices could form more piconets. Each piconet hops randomly through the available frequencies so all of the piconets are completely separated from one another. The operational frequency of each network is changing 1600 times per second, so it’s unlikely that any two networks will be on the same frequency at the same time. Bluetooth is designed to work in no. of different circumstances , it can be either half duplex or full duplex.

3.1 SECURITY

There are some special security schemes provided by the Bluetooth,

- Bluetooth uses Frequency Hopping Spread Spectrum (FHSS) techniques in order to improve its immunity from interference.
- Use of Forward Error Correction (FEC) limits the impact of random noise on long-distance links.
- A particular device has a 48-bit Bluetooth address.
- Devices can be assigned a PIN, which must be verified before others can access it.

3.2 ADVANTAGES:

- 2.4 GHz radio frequency ensures worldwide operatibility.
- It eliminates the need of cables or wires for connecting various devices.
- The capital cost is low .
- Chips are available in very small size having area 0.9 cm square, and much smaller chip versions are in development.

3.3 DISADVANTAGES

- The maximum range for this technology is 30 feet, which limits the space of your PAN and/or limits the connection accessibility needed by your other electronic devices to perform an action.
- The maximum capacity of data transmission with this technology one mega bit per second, which makes the information exchange very slow when handling large size files or folders.
- Because of the need of antennas to transmit and receive information through the radio waves, any portable device will need a size increase in order to fit the antenna.

IV. CONCLUSION

The wireless era has started and Bluetooth is one of the serious contenders in the race to the market. It is the best replacement for the cable as a short-range wireless standard offering - low cost, simple, highly reliable, better performing and secure wireless radio communication link. Still, with its all advantages, the Bluetooth technology is in its primary stages. Hence, we hope that, through the impending development phases, it will have the potential to address most of its current shortcomings.



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