

A Review on the RedTacton Technology

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Abstract: These days, electronic devices of a day are getting smaller as well as lower in terms of power requirements and are also less expensive. We started to decorate our body parts with personal information and/or various communication appliances. These devices comprise of cellular phones, digital personal assistants, and pagers. But there isn't any such method that allows the data sharing using these types of devices. These types of networking devices reduce the functional I / O redundancies and enables the new conveniences and services. On availability of smooth inter-connection between the networks, human society enters an era of modern computing. Implementation of the ubiquitous services demands for three levels of connectivity, namely, the Local Area Networks (LAN), the Wide Area Networks (WAN), and the Human Area Networks (HAN) for the purpose of connectivity to personal details, sharing data, media, and the communication devices within the much smaller communications areas. So in this paper we're addressing RedTacton Technology's new and unique functional features and its huge potential in the form of a Human Area Networking system. The human body herein serves as a means of transmission that supports half duplex mode of communication at the rate of 10Mbit / s.

Keywords: Redtacton, review, technology, Human area networking systems, communication, networks.

INTRODUCTION

Red-Tacton[1] technology opens up an electronic future in which knowledge can be available at our disposal whenever and wherever possible. Various communication equipment's needed to facilitate this immediate information access will be included in our attire. Red-Tacton technology is such a Human Area Networking (HAN) [2] technology (informed by NTT or Nippon Telegraph and Telephone Corporation), LAN [3] and/or WAN [4] that consider the surface of the human body not only as a high speed but also as a secure transmission path for a network. Allowability of a reliable and high speed HAN is achieved by Red-Tacton that is actually a first-time Break-through technology.

The organization called Nippon Telegraph and Telephone Corporation (NTTC) [5] had introduced the Red-Tacton Technology. TACTON means an "action caused by touch" and RED means an auspicious color for acquiring warmth as per the Japanese culture. This technology makes use of a surface of human body as a secure, high-speed transmission network. Human Area Networking Research.

TECHNOLOGY USED

As represented in Fig. 1, Red-Tacton requires a different approach towards technical matters. Rather than data transport relying on electromagnetic waves[6] or light

waves. Red-Tacton uses weak electric fields present on the surface of body as a means of transmission.

- 1) Red-Tacton does the task of inducing a weak electric field on body surface.
- 2) On the surface of a body, a red-Tacton receiver senses the changes that occurs in a weak electric field because of the transmitter.
- 3) Red-Tacton depends on a principle according to which optical properties of an electro optic crystal vary according to the changes in a weak electric field.
- 4) With the help of a laser pointed on an electro-optic crystal, changes that occur in the optical properties are detected. The resulting changes are converted into an electrical signal inside an optical receiver circuitry.

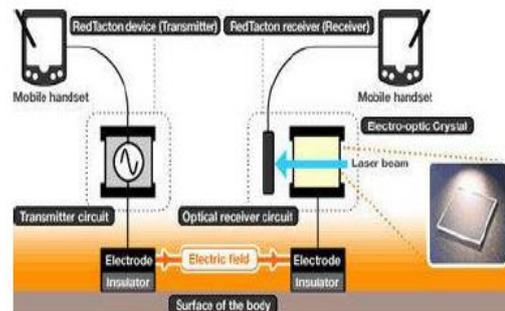


Fig. 1: Block diagram representation of RedTacton working

We can simultaneously use multiple transceivers. The reason for this is the use of a proprietary CSMA / CD or Carrier Sense Multiple Access[7] with Collision Detection protocol for Red-Tacton allowing same medium to be used for multiple accesses from multiple node ends.

The NT has developed photonic electric field sensor that helps in testing weak electrical fields by detecting the changes that occur in the optical properties of an electro-optic crystal illuminated by a laser beam.

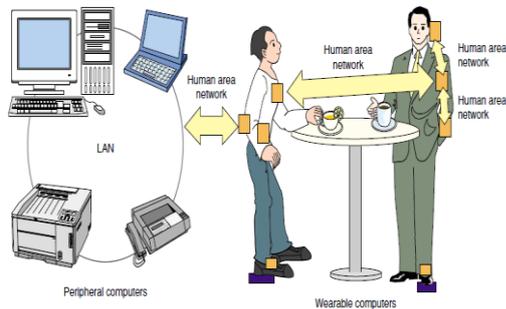


Fig. 2: Representation of Human Area Networking technology

Communication between the human body i.e. wearable computers between the electronic devices and those found in our daily environments is shown in Fig. 2. It is also important, so this has guided extensive human-area networking and the research and development that is related to it. Wired communication process between electronic devices within human-area network are inconvenient and can easily get tangled up. There are some issues associated with the short-range wireless communication systems like bluetooth and wireless local area networks (WAN - IEEE 802.11) [8]etc.

The main disadvantage of the infrared communications (IrDA)[9] is the tight directionality in relation to the beams in-between the terminals required for a system to be called as effective. The ultimate solution for all these constraints of the conventional technologies in the HAN or human area network is reported to be a "intrabody" communication, in this way of communication, a human body serves as a transmission medium.

Ubiquitous services refer to communication between electronic devices that are embedded in an environment that is in close proximity with the people. Human body could be used as a transmission medium in such an environment. This is because of its ability to serve as a perfect way to implement human area networks (HAN) because it solves all the problems, like decreasing latency, low security and high network setup costs, all in just one stroke.

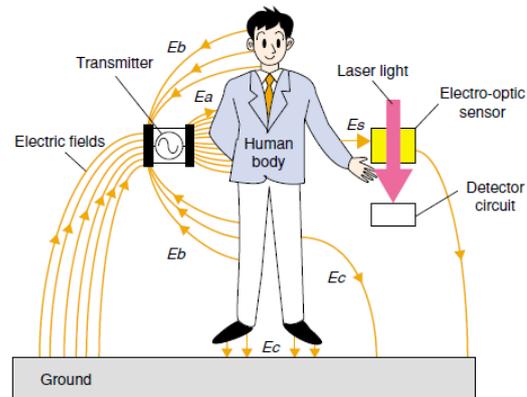


Fig. 3: Communication Mechanism of RedTacton

The process of performing communication in a Red-Tacton is shown in Fig. 3. An Insulating film is used to completely cover Red-Tacton transceiver and its transmission and reception electrodes. In this way, the body of the person that actually acts as a transmission medium is provided complete insulation. This makes the flow of current from the transceiver and into a person's body a bit impossible.

These forms of the displacement currents are quite common form of occurrences that we are all exposed to everyday. Red-Tacton is compliant with the "Radio Frequency-Exposure Safety Standard (RCR STD-38)"[10] provided by the association of Radio Industries and Businesses, also called ARIB.

Red-Tacton tools found in medicine bottles convey information about the characteristics of the medicines. Whenever the user hits the wrong drug, a warning on the terminal he is holding would immediately trigger up. The alarm sounds as and when the user hits the bottle of medication, it eliminates the usual false alarms in the passive wireless ID tags that simply activates on being at proximity.

Fig. 4 showcases the block diagram of a Red-Tacton transceiver. The transmitter comprises of a transmitter circuit that produces electrical fields towards the body as well as a data sense circuit that distinguishes between the transmission as well as the reception modes by detecting the transmission data and the control signals of outputs that corresponds to the stated modes so as to enable a two-way communication.

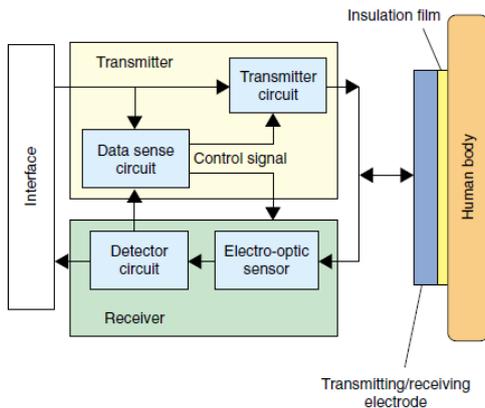


Fig. 4: Illustration of Red-Tacton Trans-receiver

RESULTS AND CONCLUSIONS

Red-Tacton is a new and exciting technology that relates to HAN or human area networking. A transceiver system has been developed that use human body as a medium of data transmission based on an electrical field sensor using crystal and laser light from an electro-optic. Through the transceiver, we managed to achieve BASE-10 contact through a human body from one side to the other according to IEEE 802.3.

While our immediate goal is to enforce a Red-Tacton system that supports a two-way intra-body communication between two points on body at the rate of 10 Mbit /s, The long-term plans include the development of a mass-market transceiver and interface that supports PDAs and notebook computers while continuing the efforts to reduce the size of the transceiver and its power consumption to improve its portability.

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**International Journal of Engineering Research in Computer Science and Engineering
(IJERCSE)**

Vol 5, Issue 1, January 2018

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