A MORE INTEGRATED DATA EXCHANGE CORRESPONDENCE IN CODE DIVISION MULTIPLE ACCESS SYSTEM

Jose J. Garcia[1], Oscar Silveira[2]
[1]Florida International University, Miami, USA, JGarC002@fiu.edu
[2]Florida International University, Miami, USA, silveiro@fiu.edu

INTRODUCTION

Recent years epidemics such as swine flu, or bird flu has attracted attention to develop more efficient systems to monitor a sudden or periodical outbreak of diseases and of a closer outlook of possible outbreaks by measuring physiological parameters as body temperature. Therefore anticipation is considered a method of protection and security resulting in a considerable interest in animal and human health monitoring systems in areas where poultry or cattle is an important economical factor. These health monitoring systems can help reduce the public risk and also to decrease the economic cost that epidemics provoke. The focus of this work is to implement a more integrated theoretical CDMA data communication system by combining a health monitoring system such as a temperature sensor or laser thermometer and a CDMA transmission device.

THE INFRARED SPECTRUM

Blackbody radiation is the thermal infrared waves emission from objects, animals or human beings bodies. Infrared thermometers are used to measure the temperature of these objects or bodies which are at temperature above absolute zero, (0 degree Kelvin). As these devices do not require direct contact with the material, they are sometimes called non –contact thermometers or laser thermometers involving with the laser term laser a train of electromagnetic in phase pulses, as a non direct touch between the object and the thermometer. The measurement principles are based upon the fact that as has been stated before all materials, objects, bodies, etc, emit energy in the infrared spectrum if these entities are above 0°K. The infrared spectrum is a subband of electromagnetic radiation that occupies frequencies between the visible light and the radio waves. Figure 1 shows a scaled diagram of the Electromagnetic Spectrum.

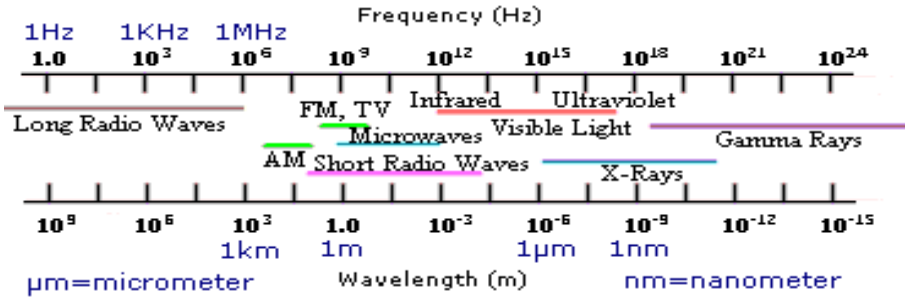

Figure 1: Scaled Electromagnetic Spectrum

INFRARRED THERMOMETER DESIGN

There are many types of non direct contact thermometers but, the most basic structure design consist of a sensor device for converting the infrared energy to an electrical signal, (voltage), which can be read by an instrument and by the use of a proper scale displayed in units of temperature after taking into account ambient temperature variations for compensation of the output electrical signal. Also, there is a lens to focus the infrared

energy on to the sensor, or detector and both, lens and detector facilitates a non direct contact from the object temperature to be measured.
Present moment infrared thermometers are not away from this fundamental concept, but high level integration electronics has widen the scope of its application. The modern infrared thermometer differs from its first generation in the use of a greater variety of detectors, linearization of the output signal, amplification, and selective filtering of the infrared signal. The application of more sensitive detectors has made possible a selective filtering of the input signal to the infrared thermometer yielding to a higher accuracy in the output temperature reading. Figure 5 shows a modern infrared thermometer.

The fact that infrared thermometers are useful for non direct contact temperature measurements makes an important contrast with other devices such as thermocouples where the structure of two different metals that produces a voltage related to a temperature difference can not be used or they do not generate accurate data for a variety of reasons that include electrical noise, the presence of a strong electromagnetic field or if a fast response is required.

There are many varieties of different infrared thermometers and sensing devices available today, with different form factors, configuration, flexibility, portable handheld made for easy transportation purposes and also with the design to be mounted in fixed positions. Several specifications such as temperature accuracy, memory, and other parameters yields to the hypothesis that an infrarred thermometer can be included into a wireless communication device such as a CDMA cellular phone, or a standalone CDMA modem for an integrated data exchange update between the mobile user and a health care system. Figure 2 shows a doctor infrared thermometer.

Figure 2: A doctor infrared thermometer

REFERENCES

Arzt, Noam H, The Evolution of Public Health Information Exchange, January 2007.
Merchant,J, Infrarred Temperature Measurement Theory, Mikron Instrument Co.
Craig, H, and Ullman, J, and Law, K, and Teicholz, P, and Keller, A, and Tiwari, S, and Gupta, A, and Krishnamurthy, K, Integrated Data Exchange and Concurrent Design for Engineered Facilities.
Introduction to CDMA.
http://www.bee.net/mhendry/vrml/library/cdma/cdma.htmHendry, M,