DEVELOPMENT OF WIRELESS SENSOR NODE FOR MONITORING INDOOR AIR QUALITY

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ABSTRACT

This paper presents the application of Wireless Sensor Node in the Development of Wireless Sensor Node for Indoor Monitoring. Two major parameters qualify the indoor air quality except polluted gas, are air temperature and relative humidity. The LM35DZ temperature sensor and A0545 basic humidity sensor are used to measure air temperature and relative humidity in percentage. Functions of sensor node are transferring data from sensor to data handler. In this project, three sensor nodes are developed and each node consists of Microcontroller (PIC16F877), Transceiver and Sensor. This microcontroller programmed to read the temperature and relative humidity of workspace every hour for one day. For research and development purposes the system implemented at Research Assistance Laboratory (Sensor Node 1), Mechatronics and Consumer Laboratory (Sensor Node 2) and Advance Signal Processor Laboratory (Sensor Node 3), Faculty Electrical Engineering, MARA University of Technology Malaysia.

TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

1.1 Introduction

Wireless sensor nodes have generated much research interest in recent years advances in electronics technology have made them feasible. A sensor node, also known as a 'mote' (chiefly in North America), is a node in a wireless sensor network that is capable of performing some processing, gathering sensory information and communicating with other connected nodes in the network. In general, such a network consists of many nodes scattered over an area to provide distributed sensing and data processing.

Previously, sensor networks consisted of small number of sensor nodes that were wired to a central processing station. However, nowadays, the focus is more on wireless, distributed, sensing nodes. When the exact location of a particular phenomenon is unknown, distributed sensing allows for closer placement to the phenomenon than a single sensor would permit. Also, in many cases, multiple sensor nodes are required to overcome environmental obstacles like obstructions, line of sight constraints etc. In most cases, the environment to be monitored does not have an existing infrastructure for either energy or communication. It becomes imperative for sensor nodes to survive on small, finite sources of energy and communicate through a wireless communication channel. Another requirement for sensor networks would be distributed processing capability. This is necessary since communication is a major consumer of energy. A centralized system would mean that some of the sensors would need to communicate over long a distance that leads to even more energy depletion. Hence, it would be a good idea to process locally as much information as possible in order to minimize the total number of bits transmitted.

The architecture sensor node consists with four basic components sensing unit, a processing unit, a transceiver unit, and a power unit [1]. The function of sensing unit