RESEARCH ARTICLE OPEN ACCESS

Under Water Wireless Control Using Zigbee For Transmissions Systems

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ABSTRACT
The aim of this project is to develop under water communication system using the zigbee protocol stack. A robot can be defined as a programmable, self-controlled device consisting of electronic, electrical, or mechanical units. An industrial robot is officially defined by as an automatically controlled, reprogrammable, multipurpose, manipulator, programmable in three or more axes. Robots are especially desirable for certain work functions because, unlike humans, they never get tired. They can endure physical conditions that are uncomfortable or even dangerous; they can operate in airless conditions.

I. INTRODUCTION

The aim of this project is to develop under water communication system using the zigbee protocol stack. This is very useful to find out any problem in caves and mines. An **embedded system** is a special-purpose system in which the compute is completely encapsulated by or dedicated to the device or system it controls Personal digital assistants (PDAs) or handheld computers are generally considered embedded devices because of the nature of their hardware design, even though they are more expandable in software terms. This line of definition continues to blur as devices expand.

Examples of embedded systems

- Automatic teller machines (ATMs)
- Avionics, such as inertial guidance systems, flight control hardware/software.
- Cellular telephones and telephone switches
- Engine controllers and antilock brake controllers for automobiles
- Home automation products, such as air conditioners security monitoring systems

II. HEADINGS

2.1 History of embedded systems
2.2 Characteristics of ES
2.3 Peripherals
2.4 Technical description
2.5 Block diagram
2.6 Types of power supply
2.7 Rectifier
2.8 Overview of keil cross C compiler

III. INDENTATIONS AND EQUATIONS

3.1 History of embedded systems

In the earliest years of computers in the 1940s, computers were sometimes dedicated to a single task, but were too large to be considered "embedded". The first recognizably modern embedded system was **the Apollo Guidance Computer,** developed by Charles Stark Draper at the MIT Instrumentation Laboratory. Since these early applications in the 1960s, embedded systems have come down in price. In 1978 National Engineering Manufacturers Association released the standard for a programmable microcontroller. By the mid-1980s, many of the previously external system components had been integrated into the same chip as the processor. By the end of the 80s, embedded systems were the norm rather than the exception for almost all electronics devices, a trend which has continued since.

3.2 Peripherals

Embedded Systems talk with the outside world via peripherals, such as:

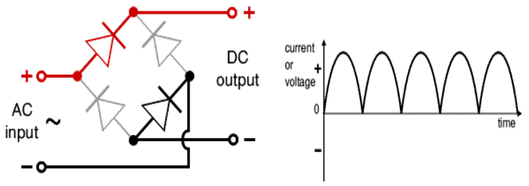
- Serial Communication Interfaces (SCI): RS-232, RS-422, RS-485 etc
- Synchronous Serial Communication Interface: I2C, JTAG, SPI, SSC and ESSI
- Universal Serial Bus (USB) ppp
- Networks: Controller Area Network, Lon Works, etc
- Timers: PLL(s), Capture/Compare and Time Processing Units
- Discrete IO: aka General Purpose Input Output (GPIO)

3.3 Rectifiers

- There are several ways of connecting diodes to make a rectifier to convert AC to DC. The bridge rectifier is the most important and it produces **full-wave** varying DC. A single diode can be used as a rectifier but it only uses the positive (+) parts of the AC wave to produce **half-wave** varying DC.

1.4 Bridge rectifier

- A bridge rectifier can be made using four individual diodes, but it is also available in special packages containing the four diodes required. It is called a full-wave rectifier because it uses the entire AC wave



1.5 Technical Description

Numbers of axes – two axes are required to reach any point in a plane; three axes are required to reach any point in space. To fully control the orientation of the end of the arm three more axes are required

Kinematics – the actual arrangement of rigid members and joints in the robot, which determines the robot's possible motions.

Speed – how fast the robot can position the end of its arm. This may be defined in terms of the angular or linear speed of each axis or as a compound speed.

Motion control – for some applications, such as simple pick-and-place assembly, the robot need merely repeatable to a limited number of pre-taught positions. For more sophisticated applications, such as arc welding, motion must be continuously controlled to follow a path in space, with controlled orientation and velocity.

Accuracy – how closely a robot can reach a commanded position. Accuracy can vary with speed and position within the working envelope and with payload (see compliance). It can be improved by Robot calibration

Power source – some robots use electric motors, others use hydraulic actuators. The former are faster, the latter are stronger and advantageous in applications such as spray painting, where a spark could set off an explosion

Drive – some robots connect electric motors to the joints via gears; others connect the motor to the joint directly. Using gears results in measurable 'backlash' which is free movement in an axis. In smaller robot arms with DC electric motors, because DC motors are high speed low torque motors they frequently require high ratios so that backlash is a problem. In such cases the harmonic drive is often used.

Software: The computer is installed with corresponding interface software. The use of a computer greatly simplifies the programming process. Specialized robot software is run either in the robot controller or in the computer or both depending on the system design.

1.6 Overview of keil cross C compiler

It is possible to create the source files in a text editor such as Notepad, run the Compiler on each C source file, specifying a list of controls, run the Assembler on each Assembler source file, specifying another list of controls, run either the Library Manager or Linker (again specifying a list of controls) and finally running the Object-HEX Converter to convert the Linker output file to an Intel Hex File.

Once that has been completed the Hex File can be downloaded to the target hardware and debugged. Alternatively KEIL can be used to create source files; automatically compile, link and covert using options set with an easy to use user interface and finally simulate or perform debugging on the hardware with access to C variables and memory. Unless you have to use the tolls on the command line, the choice is clear.

KEIL Greatly simplifies the process of creating and testing an embedded application.

1.7 Types of power supply

There are many types of power supplies. Most are designed to convert high voltage AC mains electricity to a suitable low voltage supply for electronic circuits and other devices. A power supply can by broken down into a series of blocks, each of which

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IV. FIGURES AND TABLES

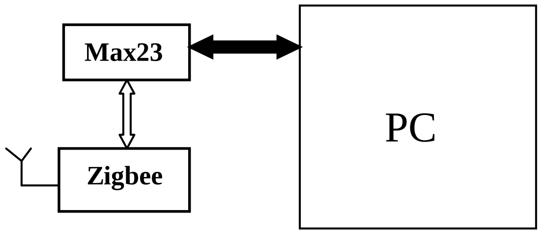

Fig1: Receiver

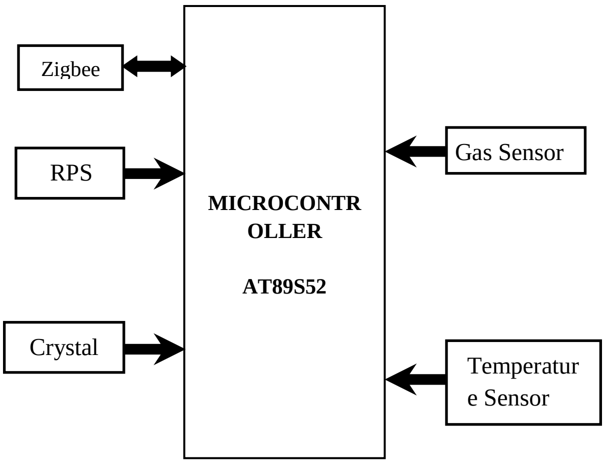

Fig2: Transmitter

V. CONCLUSION

The project **"Under Water Wireless Control Using Zigbee For Transmissions Systems "** has been successfully designed and tested. Integrating features of all the hardware components used have developed it. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced IC's and with the help of growing technology the project has been successfully implemented.

VI. ACKNOWLEDGEMENTS

I Sreenivasa Reddy P would like to thank everyone, including: parents, teachers, family, friends, and in essence, all sentient beings for their help and support this paper would not have been possible. Especially, I dedicate my acknowledgment of gratitude toward my mentor and Co-author Dr.Ch.venugopal Reddy for her guidance and support.

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[3] Ville Sa□rkima□ki, R. Tiainen, T. Lindh, J. Ahola, "*Applicability of ZigBee Technology to Electric Motor Rotor Measurements*". International Symposium on Power Electronics, Electrical Drives, Automation and Motion, Italy 2006

Examples follow:

Journal Papers:

[1] *Water Quality Monitoring System Using Zigbee Based Wireless Sensor Network International Journal of Engineering & Technology IJET-IJENS Vol:09 No:10*

Books:

[1] *The Microcontroller Idea Book* - JOHN AXELSON
[2] *The Microcontroller Application Cookbook* **-** MATT GILLIAND
[3] *Digital design* - MORRIS MANO