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Zigbee Based Farmer Friendly Agricultural Robot with Motorized Shovel Control System with Automatic Seed Dispensing System

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Abstract:

Agriculture is a backbone of our nation. Developed agriculture needs to find new ways to improve efficiency. One approach is to utilize available information technologies in the form of more intelligent machines to reduce and target energy inputs in more effective ways than in the past. Our project mainly concerns to improve the agriculture equipment as per modern system. We are going to introduce plough out of tractor controlled by interfacing with microcontroller. By using this equipment seed can be so easily with more specifications, sprinkling and cutting can be done.

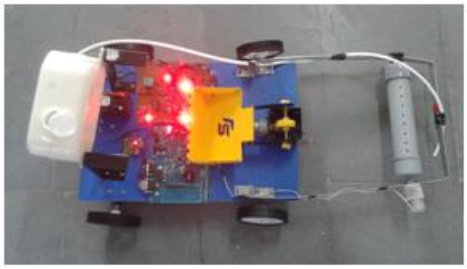
Introduction:

The idea of applying robotics technology in agriculture is very new. In agriculture, the opportunities for robot enhanced productivity are immense and the robots are appearing on farms in various guises and in increasing numbers. We can expect the robots performing agricultural operations autonomously such as ploughing, seeding, cutting and sprinkling. The applications of robotics are spreading every day to cover further domains, as the opportunity of replacing human operators provides effective solutions with return on investment. This is specially important when the duties, that need be performed, are potentially harmful for the safety or the health of the workers, or when more conservative issues are granted by robotics. Heavy chemicals or drugs dispensers, manure or fertilizers spreaders, etc. are activities more and more concerned by the deployment of unmanned options.

Literature Survey:

Existing System:

A tractor is a vehicle specifically designed to deliver a high tractive effort at slow speeds, for the purposes of hauling a trailer or machinery used in agriculture or construction. Most commonly, the term is used to describe the distinctive farm vehicle. Agricultural implements may be towed behind or mounted on the tractor, and the tractor may also provide a source of power if the implement is mechanized. Another common use of the term is for the power unit of a semi-trailer truck. The first tractors, powered by steam engines, were phased out followed by the internal combustion engine.



Drawback:

Obstacle detection. Monitoring.

Proposed Method:

When we take a look at the farming industry now, we can see that this is rapidly changing. Farmers are looking for new ways to implement technology to cut costs and reduce labor hours. One of the ways that farmers are beginning to explore new technologies in farming come from the autonomous tractor.

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The Zigbee based tractor is something that is very new to the agriculture industry, but is quickly gaining popularity from agriculture research companies around the United States. Although still in the research phase of development, autonomous tractors are rapidly becoming more of a reality than an idea. When the tractor is moving on a surface, it is controlled by Zig-bee Technology. This can be moved forward and reverse direction using geared motors. Also this robot can take sharp turnings towards left and right directions.

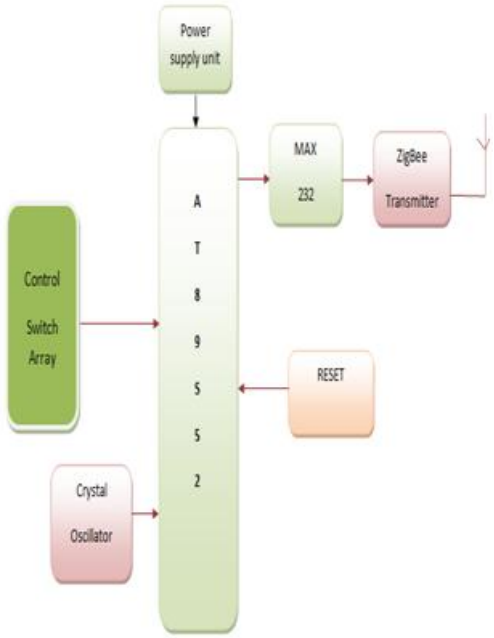
This project uses AT89S52 in the transmitter section and ARM7LPC2148 in the receiver section as its controlling unit. This robot is performs functionalities as sprinkling water, seed dispensing, ploughing and cutting the grass with the use of peripherals interfaced to ARM7 lpc2148 controller which receives input from Zigbee wireless communication.

SR.NO	PARAMETER	MANUAL	TRACTOR	SEEDING MACHINE
1.	Man power	More	Moderate	No
2.	Time required	More	Moderate	Less
3.	Seeding technique	Manually	Manually	Automatically
4.	Required energy	High	Very high	Less
5.	Labor cost	High	High	Initial cost only
6.	Pollution	no	More	No

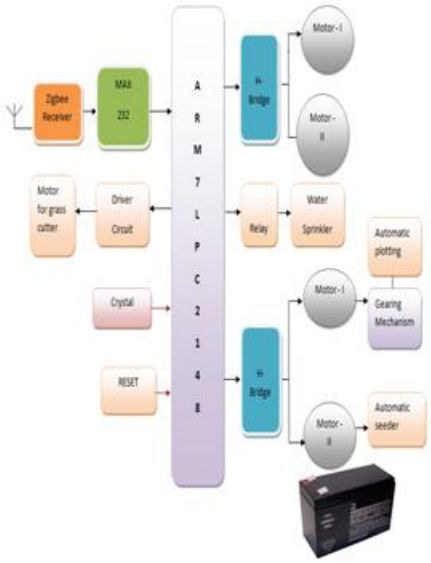
Table I.Comparison between the seed sowing Method

Block Diagram:

Transmitter Unit



Receiver:



I. Hardware Modules:

A. LPC2148 Controller:

The LPC2148 are based on a 16/32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory.

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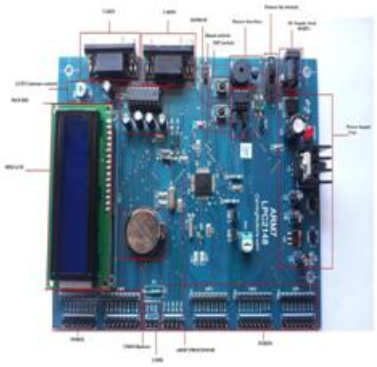
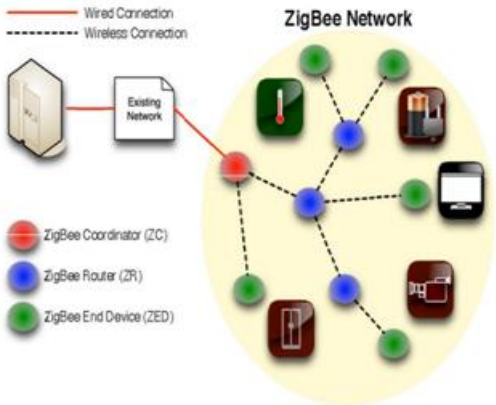


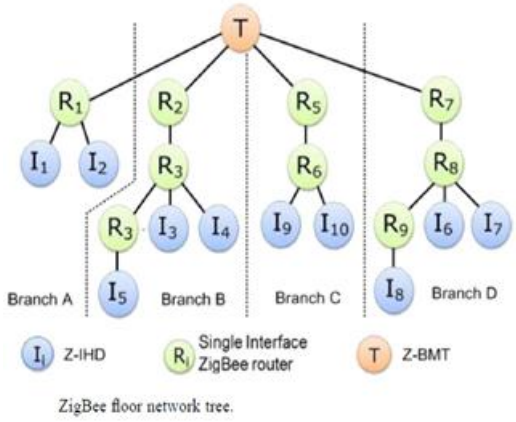
A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC, USB PORT,PWM channels and 46 GPIO lines with up to 9 external interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters and embedded soft modems as well as many other general-purpose applications.

B. Zigbee:



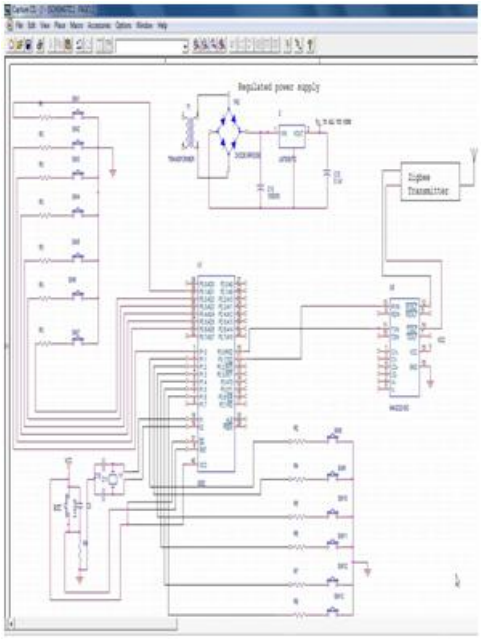
It is the wireless device for transmitting and receiving purpose or simply it called as Transceiver. Zigbee is based on the IEEE802.15.4 protocol. The range of the Zigbee is covered as 100m.

It range is 10 times better than Bluetooth device so it can be more preferable one in wireless device. The data rate is very low for transmission while using this device.



ZigBee floor network tree.

Schematic Representation of Project:



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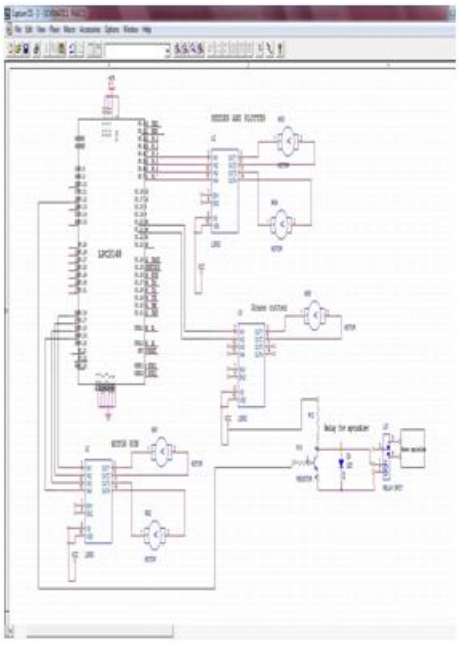

II. Software Details:

Keil Compiler

Keil compiler is a software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code.

III. Conclusion:

In This Project We Have Studied and Implemented A Farmer friendly Agricultural Robot with motorized shovel control System with automatic seed dispensing system using ZIGBEE wireless communication.

IV.References:

[1] O'Connor, M.L., Elkaim, G.H., and Parkinson, B.W. kinematic GPS for closed-Loop Control of Farm and construction Vehicles, Proceeding of ION GPS-95, Palm Springs, pp 1261-1268, CA, Sept. 1995.

[2] Bell, T. "Automatic Tractor Guidance Using Carrier-Phase GPS". Computers and Electronics in Agriculture, 25(1/2), PP. 53-56, 2000.

[3] Noguchi N, Terao H. Path planting of an agricultural mobile robot by neural network and genetic algorithm. Comput. Electron Agric, 18(2-3), pp. 187-204, 1997.

[4] Farrell J.A., Givargis T.D., Bart J.M. "Real-time differential carrier phase GPS-aided INS". IEEE Transaction On Control System Technology. pages 709-721, 2000(8) [5] Cohen, C.E., et al. Autolanding a 737 Using GPS Integrity Beacons, Navigation, Vol. 42, No. 3, Fall pp 467-486, 1995.

[6] Cohen, C.E., Parkinson, B.W., and McNally, B.D., Flight Tests of Attitude Determination Using GPS Compared Against an Inertial Navigation Unit, Navigation, Vol. 41, No. 1, spring , pp 83-97, 1994.

[7] Pervan, B.S., Cohen, C.E., and Parkinson, B.W. Integrity Monitoring for Precision Approach Using Kinematics GPS and a Ground-Based Pseudolite, Navigation, Vol. 41, No.2, pp. 159-174, summer 1994.

[8] Montgomery P. Y. and Parkinson, B.W. Carrier Differential GPS for Takeoff and Landing of an Autonomous Aircraft, Proceedings of ION National Technical meeting, Santa Monica, CA, Jan. 1996.

[9] Glenn Baddeley 2001, http://aprs.gids.nl/gps, last updated 20 July 2001.

[10]Meridian World Data,
http://www. Meridianworlddata.com.

[11] Michael O'Connor, Thomas Bell, Gabriel Elkaim, and Dr. Bradford Parkinson Stanford University, Stanford, California.

[12] Ming Li, Kenji Imou, Katsuhiro Wakabayashi, Shinya yokoyama, "Research on Agricultural vehicle autonomous guidance. Int. Agric & Bio. Eng., Vol 2, no. 3, pp 1-25.