ZIGBEE BASED WIRELESS PICK AND PLACE ROBOT

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I. ABSTRACT:

Over the year remote control techniques have been implemented in different fields for a variety of different applications. We have a remote controlled television, audio system and other consumer electronic appliances. Wireless technology is being widely used since last few years in automation and it has also became a part of our lives because now a day's peoples are using their daily life. RF, GSM, ZIGBEE are some technology that falls in to wireless category.
Robots plays a major role in many walks of life and are extensively used in the industries, medical and home appliances. They can carry out different risky jobs that cannot be done by human. In this project the wireless robot is controlled and monitoring through system. To pick the objects from remote and dangerous places where human cannot reach in industries to bring the materials in the vast plant.
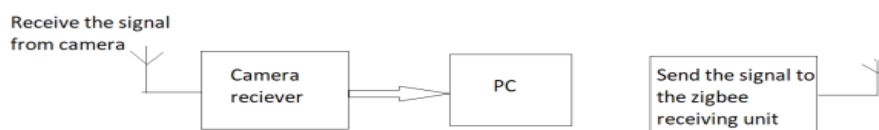
II. INTRODUCTION:

The wireless communication technologies are rapidly spreading too many new areas, including the automation and the importance of the use of wireless technologies in the data acquisition, building control, monitoring systems and automation of manufacturing processes will grow. Robots are useful to do jobs in areas and in situations that are hazardous for human.

Our preliminary aim in this project is to build an autonomous robot, which could be able to pick the objects from remote and dangerous places, where the human cannot reach, in industries to bring the materials in the vast plant, provides continuous visual monitoring, and if there is any obstacle on its path, and what is the obstacle in any remote place which is not reachable by the humans and it will be controlled by Zigbee communication.
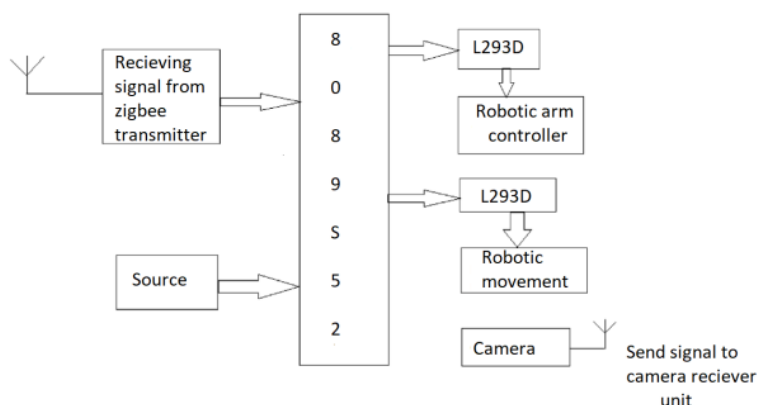
III. METHODOLOGY:

➢   Good understanding the concept of microcontroller.
➢   Study the various robotic arm.

IV. BLOCK DIAGRAMS:

CONTROLLER BLOCK

ROBOTIC BLOCK

The project is mainly consisting of two blocks they are:
Controller block
Robot block

Controller block:
The controller block contains dc adopter in order to provide a power supply to the ZIGBEE transceiver module. The input to the ZIGBEE transceiver is given by the keypad by pressing the any one key at a time.

The keypad contains 4 keys and a main switch. If the main switch is down it will control the robotic arm motor like move up, down, pick and place. When the main switch is upwards it will be controls the moments like forward, backward, right, left.
Camera receiver unit is connected to the PC through a USB part of TV tuner card. This TV tuner card will modify the signal and made to display on the PC. The receiver kit will receives the video feedback signal from the camera transmitter unit.

Robot block:
It consists of the battery, regulator, ZIGBEE transceiver module, L2193D driver IC, and a microcontroller.

To run the robot we require power supply. So this is given from battery of the range 12v, 1.2amps. The microcontroller is a heart of our project. Here we are using 8bit AT89S52 microcontroller. It has 4 ports. In this we are using port p1 is used as input and port p2 is used as output and a reset circuit is used in order to configure thee microcontroller from first. Clock circuit is used in order to provide the clock pulses to the microcontroller.
The power supply required to microcontroller is +5v so to provide the 5v supply we are using 7805 regulator. The ZIGBEE transceiver used in the robot side acts as a receiver. When any one of the key is pressed from the keypad it will send the information through the ZIGBEE transceiver which is placed near the controller side.
L293D is used in order to drive the dc motor from the low power circuit each L293D IC used to drive the 2 motor.

V.COMPONENTS REQUIRED:

- 8051 MICROCONTROLLER
- ZIGBEE TRANSCIEVER
- MOTOR DRIVER
- DC MOTORS
- WIRELESS CAMERA
- ROBOTIC ARM
- ROBOTIC WHEEL
- BATTERY

8051 MICROCONTROLLER:
- 8051architecture based AT89C51 microcontroller from ATMEL is used to implement this project.
- Microcontroller acts as the heart of this project, which controls the whole project.
- It consists of 128 bytes RAM,4k flash memory, two 16-bit timer, 6 interrupt etc.

ZIGBEE TRANSCEIVER:
- It is a high level communication protocol module.
- Zigbee is a low-cost, low-power, wireless mesh network standard targeted at wide development of long battery life devices in wireless and monitoring applications.

MOTOR DRIVER :
- Motor driver consist of Darlington pairs.
- The signal from the buffer is not strong enough to drive the motors, so the Darlington driver IC is used.

DC MOTOR:
- The BI geared motors are used, they have a speed of 2400rpm.
- The gears decrease the speed to 30rpm at 6v.
- Thus considerably increasing the torque so that the robot can carry the load of its frame.

WIRELESS CAMERA:
- Wireless cameras are basically described as a wireless transmitter carrying a camera signal.
- Camera is wired to wireless transmitted and the signal travels between the camera and the receiver.
- It has view angle of 54 degrees, resolution of 570*492 pixels, 1Ghz receiver kit.

ROBOTIC ARM:
➢ A robotic arm is a type of mechanical arm, usually programmable, with similar functions to a human arm.
➢ The links of such a manipulator are connected by joints allowing either rotational motion or translational displacement.

ROBOTIC WHEEL:
➢ A differential wheeled robot is a mobile robot.
➢ It can be thus change its direction by varying the relative rate of motion.
➢ To balance the robot, additional wheels or casters may be added.

BATTERY:
➢ An electric battery is a device consisting of one or more cells that convert stored chemical energy into electrical energy.
➢ Each cell contains a positive terminal, or cathode, and a negative terminal or anode.
➢ 12Volts portable battery is used for providing power supply to all parts of robot system.

VI.CONCLUSION:

Zigbee based PC controlled wireless pick and place robot with video feedback system can work in any environment and under any condition .The main application of this system is to pick and place object from one place to another with the continuous visual monitoring, by the use of sophisticated microcontroller chip and zigbee module has reduced the weight, cost, size and power consumption is of the system. We have design it in such a way that this robot can be moved anywhere and it can get the information of particular place.

VII.REFERENCE:

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VIII.WEBSITES:

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