

Intelligently Investigate Robot

The project aims in designing an “Intelligently Investigate Robot” which is capable of monitoring temperature, smoke in a pipe of an industry along with traveled distance from the starting point. The robot is operated through PC using wireless Zigbee technology and the parameters will be displayed on PC also the live images can be seen on the PC. This robot has a high power LED which acts as a light source when light intensity in the pipe is low. It is a low cost robot used to monitor the changes of different parameters in the industrial pipes.

Zigbee is a PAN technology based on the IEEE 802.15.4 standard. Unlike Bluetooth or wireless USB devices, Zigbee devices have the ability to form a mesh network between nodes. Meshing is a type of daisy chaining from one device to another. This technique allows the short range of an individual node to be expanded and multiplied, covering a much larger area.

The controlling device of the whole system is a Microcontroller. Whenever the user presses a button in the PC, the data related to that button is sent through Zigbee module interfaced to PC. This data will be received by the Zigbee module in the robot system and feeds this to Microcontroller which judges the relevant task to the information received and acts accordingly. The live images from the camera in the robot system can be sent to PC through AV transmitter system. Whenever, any increase in smoke or temperature is detected, it alerts through buzzer alarm system. Also, continuously the distance is updated in the PC. The Microcontrollers used in the project are programmed using Embedded C language.

The objectives of the project include:

1. Wireless controlling of Robot through PC using Zigbee technology.
2. Capable of monitoring temperature and smoke.
3. Capable of displaying the distance traveled.
4. Live Audio and video can be seen on TV.

The project focuses on the following advancements:

1. Zigbee technology.
2. Interfacing Zigbee module to PC.
3. Interfacing Zigbee module to Microcontroller.
4. Characteristics of LDR, temperature sensor and smoke sensor.
5. DC motor working and need for motor driver.
6. Embedded C programming.
7. PCB designing.

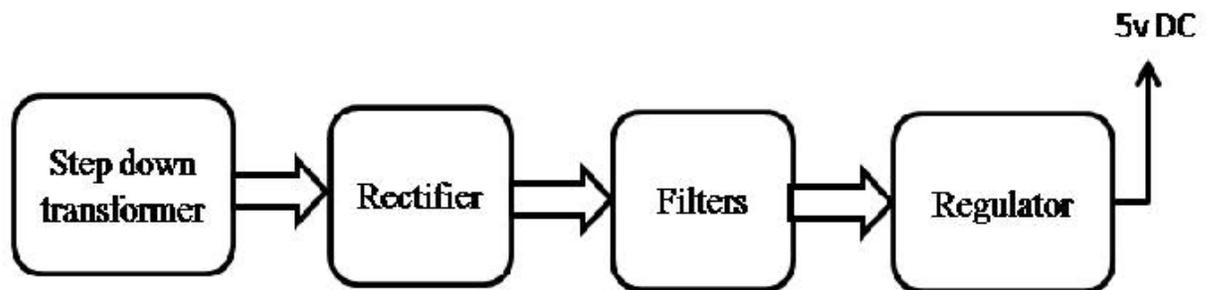
The major building blocks of this project are:

1. Regulated Power Supply
2. Micro Controller.
3. Zigbee modules.
4. DC Motor with driver.
5. Crystal oscillator.
6. Camera.
7. LDR.
8. High power LED with driver.
9. Buzzer with driver.
10. Reset.
11. AV transmitter and receiver.
12. LED indicators.

Software's used:

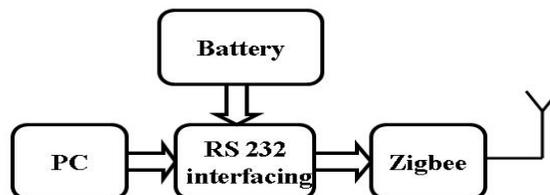
1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.
4. Proteus for hardware simulation.
5. HyperTerminal

Regulated Power Supply:

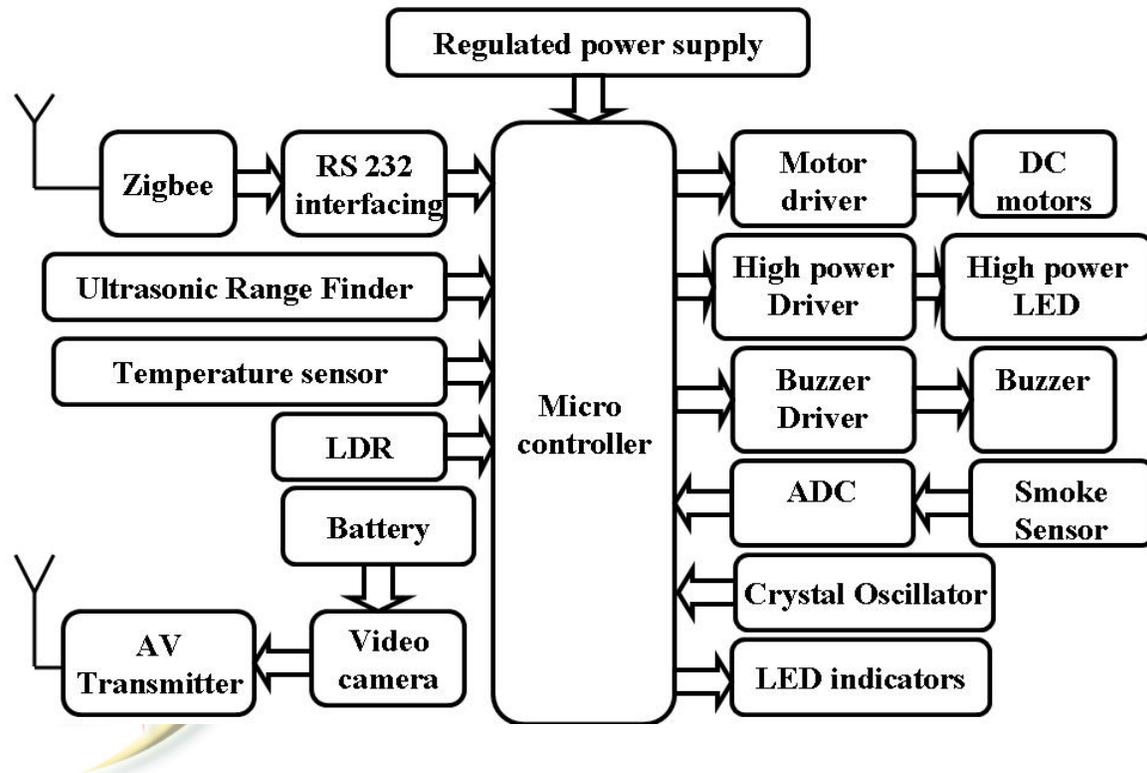


Block diagram:

Pipeline detecting Robot 1. Transmitter



Pipeline detecting Robot 2. Receiver



Pipeline detecting Robot

3. AV Receiver

