

Wireless Control Crane

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Abstract: Here we are introducing Wireless control crane which can be used in industry to lift heavy weights i.e upto 25 to 125 kg. In this we are controlling the crane by RF data transfer to wirelessly control a crane arm by using zigbee module. The Wireless control crane is a powerful gadget and we wanted to build a new hack with it. Our crane is composed of two servo motors, one of which is connected to a gripper. The servos motors are controlled by PWM signals sent by the pic16F628A, and these signals are generated from parsing the received data from a serial connection with a wirelessly connected through zigbee module.

Index Terms: PIC16F628A, Zigbee module, relay board, limit switches.

I. INTRODUCTION

Currently in industries to control cranes we need a control panel or by buttons we control the movements of the crane. The Wireless crane can controlled the movements of crane by using wireless keypad just by pressing the buttons on the remote with the help of zigbee module. Crane Remote Control With the modern innovation in the wireless industrial systems many applications are designed by the well known manufacturers in order to improve the safety of the operators and the increasing the productivity now a days. The modern crane remote control used in the industrial sectors greatly improves working site safety by providing the operator the safest advantage point for effective control of the crane. Cranes are mostly used in many industries and also at construction sites. As it is wirelessly controlled so, it has a great future ahead at small scale as well as large scale level in industries.

Crane Remote Controlled With the modern innovation in the wireless industrial systems many applications are designed by the well known manufacturers in order to improve the safety of the operators and the increasing the productivity. The wireless crane which is controlled by the remote is used in the industrial sectors greatly improves job site safety by providing the operator the safest advantage point for efficient control of the crane. This is a one-man control remote system that eliminates the need of any manually stabilizing the load while providing its placements. While using the system the operator can concurrently control the crane while moving around the work area. The Electrical or Hydraulic crane control wireless remote controllers apply the latest innovation in the modern remote control technology.

II. LITERATURE SURVEY

Cranes are mostly used for transportation of heavy material in factories, warehouse, shipping yards and building construction. In order to lift heavy weight in factories, in building construction, in industries and on ships and etc, cranes usually have very strong structures. Generally responding to commanded motion with oscillations of the payload and hook. The swaying phenomenon introduce not only reduce the capacity of the crane, but also cause safety problem in the complicated

working place. Previously, all the cranes were manually operated. But manual operation became difficult when cranes became faster and higher. Due to this, efficient controllers are applied to the cranes system to guarantee fast turn over time and to meet safety requirement. Crane Remote Control With the modern innovation in the wireless industrial systems many applications are designed by the well known manufacturers in order to improve the safety of the operators and improve the productivity.

The modern crane remote control used in the industrial sectors greatly improves job site safety by providing the operator the safest advantage point for effective control of the crane. This is a one-man control remote system that avoid the need of any second person stabilizing the load while guiding its placements. While using the system the operator has the simultaneous control to move around the work area while setting the load precisely into position. The Electrical or Hydraulic crane control wireless remote controllers apply the latest innovation in the modern remote control technology.

The system greatly reduces all types of risks during the operation. It also provides great level of security while using for the large cranes. The remote control buttons are generally specified by the customer only This is a one-man control remote system that eliminates the need of any second person stabilizing the load while guiding its placements.

III. SYSTEM DESIGN MODULE

In this system model consists of two section transmitter and receiver section, transmitter is wireless remote, which will control the hoist of the crane by receiver section.

Block Diagram of Transmitter

The transmitter section consist of keypad, zigbee, PIC16F628A, 3.3V power supply with 9v battery. The keypad is a set of four buttons and it is interfaced with PIC16F628A. The four buttons on the keypad are used for the movement of the crane in left-right or up-down direction. Every key has a unique control like up key is used to move the crane in upward direction and down key is used to move the crane in downward direction and left

and right keys are used to move the crane left and right direction respectively. The zigbee in the block diagram is the communication protocol. the purpose of the wireless communication protocol is to provide communication between control application and keypad. Zigbee is interface with IC. Whatever input will be given to the transmitter through keypad will pass through the zigbee to the receiver. The power supply is used to provide power to zigbee and IC. The 9v of power supply is battery given by the battery. And thus the data is transmitted by the zigbee module of transmitter to the receiver section.

Block Diagram of Receiver

The receiver section consist of zigbee the data transmitted by the transmitter section of zigbee module is received by the zigbee module of receiver section. Zigbee is wireless networking standard that is aimed at remote control and sensor applications which is suitable for operation in harsh radio environments and in isolated locations. ZigBee technology builds on IEEE standard 802.15.4 which defines the physical and MAC layers. Above this, ZigBee defines the application and security layer specifications enabling interoperability between products from different manufacturers . In this way ZigBee is a super set of the 802.15.4 specification.

The 3.3v p.s is given at the input of zigbee and PIC16F628A microcontroller. the output of zigbee is processed by PIC16F628A microcontroller which is powerful (200 nanosecond instruction execution) yet easy-to-program (only 35 single word instructions CMOS FLASH-based 8 bit microcontroller packs Microchip's powerful PIC® architecture into an 18-pin package and is upwards suitable with the PIC16F628, PIC16C62XA, PIC16C5X and PIC12CXXX devices. The PIC16F628A features 4MHz internal oscillator, 128bytes of EEPROM data memory, a capture/compare/PWM, a USART, 2 Comparators and a programmable voltage reference that make it ideal for analog/integrated level applications in automotive, industrial, appliances and consumer applications

IV. ALGORITHM

- Step1 - Start
- Step2 - Input as per operation
- Step3 - Initialize the controller
- Step4 - First data is encoded
- Step5- Data received by receiver is decoded
- Step6 - Switch relay as per decoder data
- Step7- Wait for half second
- Step8- Control hoist as per instruction
- Step9- Drive motor
- Step10- Stop

V. SOFTWARE REQUIREMENTS

- Proteus 7.8i
- Protel 98se
- Keil software 4.0
- Flash magic
- Eagle for PCB design

- Visual basic (VB 6)

1. Proteus:-Proteus software used for simulation of circuit.
2. Protel 98se:-Protel 98se software used for PCB (printed circuit board) designing.
3. Keil software:-Keil software used for type and run a program in computer.
4. Flash magic:-Flash magic software used for burning a program in microcontroller PIC18F452 by interfacing kit with computer

VI. CONCLUSION

The project “WIRELESS CRANE CONTROLLED CRANE “So, by using wireless keypad the user can operate and simultaneously can do other work. The user interface for our project is the Wireless crane, which is a common device and extremely safe. It is easily accessible and reliable.

VII. FUTURE SCOPE

As Cranes are widely used in industries and at construction sites. And as it is wirelessly controlled so it has a great future ahead at small scale as well as large scale level , because wireless crane is replace the part of the PLC controller by zigbee module. Which save the cost of PLC controller and wiring cost of wired remote. In less investment we can implement.

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