Remote Terminal Mobile Robots Controlled by Microcomputer

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Abstract

In this paper, presents the design of mobile field robot controlled by microcomputer. The computer works as the supervisory system for decision making and sending command to control the field robot. An information from encoder, infrared sensors using for control task of the robot that can be interconnected with the computer through the serial communication RS422 standard. In this case, the user can design the program algorithm base on microcomputer in order to control and define the routing of the mobile robot. Moreover, the robot can be installed other equipment for collect data such as picture, sound, temperature etc., in order to working in the dangerous area.

1. Introduction

Typically, the robot system is widely used to work instead human especially unsuitable operations such as in dangerous area. There are many kind of robot ,that used in different purpose for example, the arm robot in the automotive manufacturing process, the mobile robot for transportation in factory and observation mobile robot which work on the space. In order word, the development of the robot focused to the controlling with high accuracy as well as system intelligence by mean emphatically mechanical design and programming algorithms, respectively.

Presently, the information system technology (computer network, communication system ,.etc) is rapidly developed including the factory communication system such as fieldbus system[1],[2],[3]. The remote terminal mobile using fieldbus concept which is basically a digital communication.

In this paper, the mobile robot work as the fieldbus device and the host computer work as fieldbus supervisor. The host computer and each unit of robot can connected to be a network system via serial communication RS 422 standard. This network can be linked to maximum of 32 remote terminal mobile robot with several hundred meters over the twisted pair. The information from encoder, infrared sensors that installed on the robot will be sent to host computer in form of the packet command. In this case, the users can design the programming algorithms base on microcomputer in order to control and define the routing of remote terminal mobile robot.

Moreover, the robot can be installed other equipment for collecting data such as picture, sound, temperature etc.,

2. Mobile robot network configuration

The network system is the multi drop network, which consists of the host computer, work as supervisory system and all of remote terminal mobile robots, work as field device. Host computer via RS 422 serial communication controls the remote terminal mobile robots. This communication can link up to 32 of mobile robots with long distance (up to 4000feet). Each robot has to set a different unit number that start from unit 00 to unit 31by setting on DIPswitch. Fig. 1 shows the mobile robot network configuration.

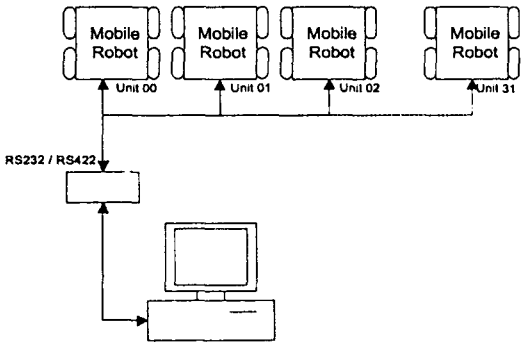

Fig 1.Mobile robot network configuration.

Each robot used microprocessor MCS-51 to control operations : control of speed, position, direction in DC motor and sent/receive information according to command on host computer.

In addition, the infrared sensors installed to detect the object on the routing in order to hit protection. Fig 2. shows the system configuration block diagram.

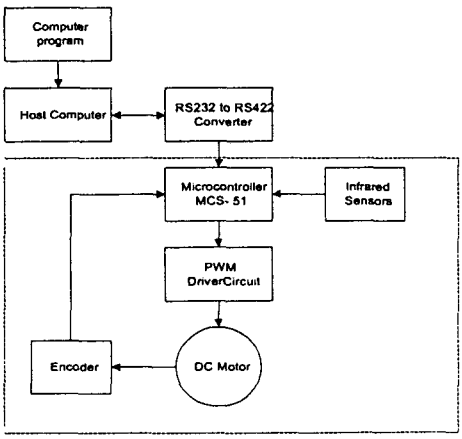

Fig. 2 System configuration block diagram.