Application Analysis of Single Chip Microcomputer Technology in Electric Drive Control System

Tao Li[1], Hua Yang[2], Sirui Wen[3]

[1]Sichuan Aerospace Vocational College

[2]CNPC Chuanqing Drilling Engineering Company Limited

[3]Sichuan Aerospace Vocational College

Abstract: With the continuous development of information technology, the performance of the entire electrical traditional system is gradually optimized. Among them, the single-chip technology as an important part of the electrical traditional system determines the operation quality of the entire traditional system. Based on past work experience, this paper summarizes the basic overview of single-chip technology. This paper is analyzing the application in software system, the improvement of the whole device performance algorithm, the application in the system header file, the application in the control system, the practical application. The six aspects of precautions and application examples are discussed in the application of single-chip technology in electric drive control system.

1. Introduction

As the automation system continues to advance, the entire control system of the electric drive system needs to be kept in perfect condition and in a state of perfection to ensure that the quality of control can be improved. In addition, the application of single-chip technology can not only enhance the working efficiency of electrical traditional systems, but also maintain the correct rate of data calculation, which is of great significance for the development of the entire electrical system. From the perspective of the application principle of single-chip microcomputer, it is mainly based on integrated components, and combined with the actual system content running function to achieve continuous optimization of computing precision.

2. Basic Overview of Microcontroller Technology

2.1 Technical Principle

The MCU belongs to a kind of circuit chip. During the working process, the chip can effectively integrate the contents of the resistor component and the inductor component, and then display the central processing capability. In addition, for the design of the actual single-chip integrated circuit, the main content involves CPU, RAM and various types of drivers, etc., to ensure that the integrated circuit can maintain normal operation while allowing data information to be read and analyzed more and more perfect. Then through the effective combination of the converter, the information and data are fully transformed, and more effective information content is identified. However, it can be seen from the actual working process that the most common single-chip microcomputers mainly include the central processing unit, RAM, and ROM. This type of single-chip microcomputer has many types and

applications, and can be applied in many internal combustion engines and large-scale machinery. In addition, for the demonstration of the working principle of the single-chip technology, it should be based on the effective integration of various circuits. Then use the pin interface to ensure the comprehensive acquisition of information parameter data and strengthen the stability of information transmission. It should be noted that the internal structure of the MCU technology is not complicated. Whether it is modular management or mastery of the operation precision, the application advantages can be better displayed.

2.2 Technology Type of Single Chip Microcomputer

Although the application of single-chip technology is mainly based on computer technology, due to different application environments, relevant technicians need to effectively adjust internal parameters to ensure effective adaptation to relevant environments and demonstrate coordination with the system. In general, the types of single-chip technology mainly include general-purpose, control-type, etc., which can play a role in the industrial management process. It also can make full use of its control range and precision functions, and strengthen the control precision of the automation system. However, it can be seen from the application process of the single-chip technology that the integration with the external interface of the home appliance system and signal reception can ensure the full operation and control of the device system. In addition, among the general types of single-chip microcomputers, it is possible to comprehensively distinguish operations according to the application range, display the integrated features of all functions, and display a reasonable control range, which is also a necessary condition for the precision operation of mechanical equipment. If the MCU is selected according to the specific product characteristics, the MCU used belongs to the special-purpose category, followed by the bus-type MCU, which can provide parallel bus through the internal system to ensure more centralized processing opportunities.

2.3 Microcontroller Structure

For the single chip microcomputer, it mainly includes a control module, an arithmetic module and a registration module. First of all, in the application process of the control module, it belongs to the core of the whole single-chip technology, which will play a vital role in the operation of the main system. Besides, for the operation operation of the actual control module, according to the information instruction of the actual device memory, the command position can be matched, and then the program coding device can be used to realize the full translation operation of the instruction data to ensure the full execution of the template control work. In addition, in the specific control process, it is necessary to set a reasonable instruction to develop the preparatory conditions. Once the data meets the actual instruction requirements, the data can be properly controlled in the system to ensure that the program system can enter the optimal logic state.

Followed by the registration module, the main content includes address counter, data memory and address memory. Among them, the address counter is particularly important. Once the previous instruction information enters the address timer, the main body counter will move to the next instruction and position the instruction position reasonably. The data memory belongs to a storage unit that outputs input data, and not only can store instruction information, but also save input and output data information, thereby enhancing the security and stability of the data stream.

3. Characteristics of the Microcontroller

3.1 Features

In the application process, the single-chip microcomputer can display many different functions, and the operation and operation are relatively simple, and the price is relatively low. The specific operation principle is shown in Figure 1. It is precisely because MCU has these advantages that it is used in many fields and industries, such as communication, transportation, intelligent control, etc., to present its role and significance. In addition, in the process of using the single-chip microcomputer, it can also

display obvious advantages such as strong anti-interference ability, low requirements for the application environment, and rapid use of the environment. For indicators such as coal mine electrification temperature and chemical composition, It also enables precise and real-time control.
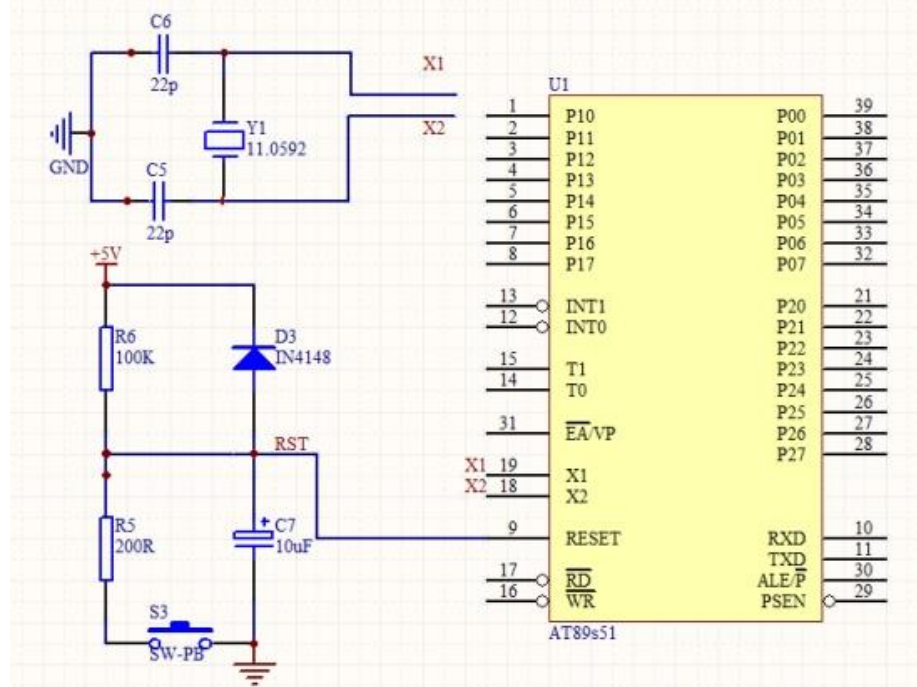

Figure 1 Schematic Diagram of the Operation of the MCU

3.2 Electrical Control System in the Information Age

With the advent of the industrial revolution and the innovation of science and technology, many traditional electrical methods of the new situation have been studied and widely used in real life and work. The actual electrical traditional working process is mainly to convert electric energy into mechanical energy by means of electric motor, which drives various machinery to enter the production working state and reduce the labor force. At the same time, the electric energy conversion efficiency of the electric motor is very high, the running cost is limited, and the electric energy configuration is also easier to realize. This also makes the electric drive application in many industrial fields, and gradually becomes the mainstream power system in today's society, provide more opportunities for industrial development. In the development process of the new era, the role of information technology in production and manufacturing is more and more obvious. And electric drive as the foundation of industrial manufacturing can provide development direction for subsequent electrical control, and present high-efficiency and intelligent features.

4. Application of Single Chip Microcomputer Technology in Electric Drive Control System

4.1 Application in Software Systems

As one of the important technology types in the process of China's modernization development, MCU technology has been recognized by many people. Besides, the application of the single-chip microcomputer in the electrical traditional system can enhance the overall operating efficiency and quality of the electrical equipment, and provide convenient conditions for the follow-up work. In addition, people can also carry out high-speed processing operations on related information data by means of single-chip technology according to the actual software system content, which can obviously promote the whole data storage operation, and the efficiency is more obvious. So that the electrical equipment abilty to be demonstrated. With the continuous updating of science and technology, the single-chip microcomputer is also in an escalating state. Therefore, the calculation accuracy of the

entire single-chip microcomputer needs to be substantially improved. At this stage, in the processing of data information of the whole single-chip computer, the computer C language is the most common. For the execution of this technology, in addition to ensuring the information processing speed, the relevant staff must use the original code to complete the single-chip technology operation, and the C language and the scheduling and processing functions between modules are presented. In addition, when designing the parameters of the electric drive equipment, the relevant designers should add the corresponding source code when ensuring the accuracy of the transfer work, and ensure the smooth execution of the file check work through the actual program connection and translation operation.

4.2 Improvements to the Overall Device Performance Algorithm
Through the single-chip technology to deal with the current loop and speed work in the electrical traditional system, the staff needs to pay more attention to the speed adjustment work. Due to the accuracy of the speed encoder itself, it has a great relationship with the accuracy of the transmission equipment itself. Therefore, designers need to pay more attention to this problem in the application process of the actual single-chip technology. For example, when the designer uses T to represent the time interval, the PL generated in T should be said to be the actual settlement value to ensure effective control of the loop sampling period. In addition, during the commissioning operation of the specific electric drive equipment, the staff should carry out effective confirmation of the I and P parameters. Only in this way can the accuracy of the data operation be strengthened after the operation speed of the electric drive data information is improved. It also can make the foundation for the normal operation of electrical traditional systems.

4.3 Application in System Header File
Due to the application of single-chip technology, it can ensure the essential improvement of the running performance of equipment in electrical traditional systems. In addition, the single-chip technology itself can have a great impact on the electrical traditional system header files. When the relevant personnel study the application method of the single-chip microcomputer in the electrical traditional system, it is necessary to ensure that the header file form of the single-chip system is fully highlighted. Only in this way, the application of the whole single-chip microcomputer Value can be better displayed. For example, in the application process of the 96 series MCU, the functions displayed are different due to different MCU models. In view of this situation, the designer needs to carry out the design of the head file of the MCU according to different models in the process of designing the electrical traditional equipment. Only after the work is successfully completed can the system program transfer work be completed smoothly and the MCU can be transplanted. The development speed has been comprehensively improved, creating more technical support and assistance for the subsequent operation of electrical equipment.

4.4 Application in Control System
In the long-term practice, the most common MCU control system mainly includes the following aspects: First is the control circuit. In general, the control circuit mainly involves keyboards, microcontrollers, displays, and the like. Second is the main circuit. The design of the main circuit mainly relies on the circuit forms such as rectifier circuit and filtering to complete the effective integration operation of the IPM module, and finally form the H-bridge. Third is the interface circuit. The so-called interface circuit is mainly to control the operation process of the single chip microcomputer and strengthen the accuracy of information transmission in the circuit. For example, during the operation of the internal single-chip microcomputer, it is necessary to present the relationship between the data of the travel bus between the keyboard and the display, to create a new interactive function, and to achieve independent control of the internal functions of the entire single-chip microcomputer system. In other words, if you are doing a comprehensive analysis from the perspective of data sampling, there are many data calculations involved. Therefore, the designer needs to ensure that the data bus address does not show any errors, and thus the system's throughput function

is better displayed.

4.5 Practical Application Considerations

Based on the essential characteristics of single-chip technology and electrical traditional control system, the staff needs to pay more attention to the following aspects: First is technical issues. The staff needs to start from the relevant technical indicators to achieve effective selection of the MCU chip, to ensure that the MCU maintains a safe and stable operating state under certain indicators. Second is the practical problem, in order to ensure the supply channel and credibility of the MCU, choose a reasonable manufacturer. That not only is used to ensure that the MCU technology and electrical traditional control system requirements are consistent, but also to ensure long-term safe and stable operation. Third, the issue of developability, in the actual application process, it is necessary to pay attention to the selected microcontroller should have a good development method, such as the tools of the program development process, as well as the simulation debugging operation means, etc.

4.6 Applications

In order to present the actual application effect, this paper takes the DC servo control system composed of 80C1936 single-chip microcomputer as an example to refine the control, main body and interface, and build the basic circuit. In general, the main contents of the control circuit are system circuit, display and keyboard, etc. The main body current involves the matching of rectifiers, filters and H-bridges. People need to carry out effective circuit signal transmission control operations according to the corresponding interface circuits. It should be noted that this part of the keyboard and the 80C51 display together constitute the upper computer, which can control the display part separately, and the execution of the data exchange work needs to be carried out by means of the serial bus, and the execution of the control operation of the 80C196MC subsystem is separately processed. It can be applied to the 16-bit system bus, and the goal is to comprehensively strengthen the system's own throughput. At this stage, since the most commonly used is a 16-bit address data bus, at this time, two pieces of memory need to use one address in common. In addition, the internal drive technology of the electric drive control system can make the system operation more convenient and flexible, and is lower than a series of external interference and invasion.

5. Conclusion

In summary, with the continuous optimization of information technology, people can integrate the single-chip technology into the electrical traditional system, and then further optimize the performance of the traditional system, improve the shortcomings of the traditional system, and ensure the stable operation of the traditional system. At the same time, through the analysis of the single-chip technology, the file module, control module, etc. can be applied to the transmission system, and the amount of filling will further improve the system accuracy.

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