

Application and Realization of PLC Technology in Mechanical Electrical Control Device

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Abstract: Nowadays, both automation and computer technology have been greatly developed, and PLC technology is also widely used in the field of mechanical and electrical control because of the development of these technologies. PLC technology plays an important role in the digital mechanical production. It can not only improve the mechanical and electrical control devices, but also achieve the purpose of mechanical and electrical automation. As a mainstream technology, PLC has high technical level requirements for related configuration and operation. Therefore, the application of PLC technology has a very high implementation value. Researchers are constantly exploring and deepening PLC technology so that they can be efficiently applied to mechanical electrical control devices. Therefore, this paper briefly analyzes and discusses the application and implementation of PLC technology in mechanical and electrical control devices.

Keywords: Mechanical and electrical; control device; PLC technology; system

In the mechanical and electrical control devices, the previous working methods have not been maintained for a long time, and sometimes they are prone to failure. Therefore, they cannot meet the standards for the development of society today. To prevent the occurrence of such a situation in the traditional way, it is necessary to mainstream an advanced technology in mechanical and electrical machinery. This is PLC technology. PLC technology is a new emerging technology. Compared with the previous working methods, it has many advantages, such as perfect control system and advanced technology. And the response after applying PLC technology is also very good, at the same time it can be used in many places, reliable and safe, and it can repair and control the previous frequent problems. Although the PLC system is relatively complicated, it is very simple in practice and the equipment is updated quickly. Therefore, it is widely used in mechanical electrical control devices.

1. A brief introduction to PLC technology

1.1 The development background of PLC technology

The rapid development of computer information technology has laid a foundation for PLC technology. Therefore,

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only if the information technology of computers has been improved, PLC technology will also improve. The 1970s is an important turning point in the development of control technology. Researchers have developed and developed controllers that can edit programs, and they have been installed in cars and put into industrial production. The results obtained are significant. The emergence of PLC technology in the 1990s, with the passage of time, its ability to control and calculate has been improving, based on this, the field of mechanical and electrical applications have applied PLC technology, until now, this technology is still improving and has been playing an important role in related fields.

1.2 The general principle of applying PLC technology

Now popular PLC technology is an electronic device combining computer technology and automation technology. It can be used for editing and storage, and it can also calculate the data in various programs, and can establish the analog and link between the output and the input program port, so as to achieve the full control of the production of mechanical and electrical equipment on a line.

1.3 The basic structure of PLC technology

PLC technology is mainly composed of five basic structures, the most basic is the power and memory, the second is the input of the output interface, and then a built-in editor, and finally the expansion slot. The five parts, which are combined with the effective control of the data and power, become a complete body, and the outside also needs to establish a control scheme with practical operation meaning through the nature of a device. Only in this way can we fully demonstrate its effectiveness in the field of mechanical electricity^[1].

2. PLC technology applied to mechanical and electrical control

2.1 Application of PLC technology in air compressor

In conventional mechanical and electrical control devices, most of the functions of a single device are realized by a single-chip microcomputer. This method is easily interfered with by the outside world, resulting in a reduction in the work efficiency of the mechanical and electrical control device. In addition, previous air compressors have experienced safety accidents due to their immature technology and poor quality. PLC technology draws lessons from the previous technology, and combines the advantages of the previous technology, abandons the immature technology, simultaneously carries out the technological innovation, effectively combines automation and crisis control technology, and applies it to the air compressor in the mechanical and electrical control device, making the operation of air compressor more safe, efficient and stable. In addition, the rational use of micro controller in the control device, PLC technology can fully control the mechanical operation, and safe and reliable, and then improve the working efficiency of the electrical appliances^[2].

2.2 Reasonable application of PLC technology in mechanical and electrical safety monitoring

It is of great significance to carry out effective and scientific safety monitoring in mechanical and electrical equipment. Application of PLC technology can automatically manage the control and automatic monitoring of mechanical electrical equipment, through the sensor system to monitor the operation of the electrical equipment, can be related to the data within a certain period of time to the professional control and technical personnel. If a mechanical failure occurs, the safety monitoring system will immediately stop the working equipment, transmit the related fault to the center of the control, and then analyze the fault in detail and integrate the scientific information to solve the fault. To solve the problem of equipment failure in a short time, not only can the equipment continue to operate safely, but also it can reduce many unnecessary losses.

2.3 Effectively apply PLC technology in mechanical electrical control system

In the past, many power switches of unimproved electrical control systems were built on one to one, in this way, it is difficult to manage and use it with a lot of difficult operation, and even very easy to be disturbed by the outside. The

effective application of PLC technology can simplify the automation control procedures of mechanical electrical equipment, simplify the electrical control circuit and compress space. This will not only be able to operate effectively in a short time, but also make the electrical system more reliable and safer. During the actual operation of the mechanical and electrical control device, the PLC technology, through the spontaneous fault analysis and diagnosis, and the control performance of the computer, carries out supervisory control to the running electrical equipment, and quickly finds out the problems and analyzes the cause of the problem. At the same time, it is necessary to control the spread of the problem and cure the source of the problem through scientific means to ensure the normal and efficient operation of machinery and equipment^[3].

3. Several ways to realize PLC technology in mechanical electrical control device

3.1 Design a more complete control system

If we want to realize the practical application of PLC technology in the mechanical and electrical control device, the most perfect is to design a more complete control system to strengthen the control ability of the program in the control device. Based on the rational application of the PLC control system function, different schemes are designed according to the different functions of the system, the design of each part of the system is closely linked to the formation of a complete control system, and the PLC technology plays an effective role in the centralized control system. This not only can take a very little time to design the control system, but also allows the device control system to be rigorous and reliable. PLC technology will make the central control system work more efficiently, and the cost of application is not high. If a problem occurs when the PLC technology is used in a centralized control system, the system operation should be stopped immediately to ensure the stability and safety of the product. If PLC technology is used in a decentralized control system, it should be based on the decentralized control of different objects, effectively combining each production line, and then collecting data for analysis. In the control of the production line, several machines are arranged and different PLC is applied to different objects to ensure that the other production lines can still work normally when problems arise^[4].

3.2 Scientific analysis of schematics

The schematic diagram can clearly reflect the core of a equipment work, which can ensure the high quality of the equipment and the high quality of the system. The schematic diagram can play a great role in testing, using a device, or even when the equipment is optimized. Therefore, the effective application of PLC technology requires a scientific and rational analysis of the schematic design. The schematic diagram can clearly show the problems existing in the technology, and can also directly improve and optimize the system and immature technology. In the design of the schematic, each professional technician has different thinking and evaluation criteria, while the experimental operation of the equipment needs to be in a specific time and place, and then according to the current equipment related to the principle of the design of the schematic. Comprehensive scientific analysis of the schematic is an important step, which is closely related to the actual operation of PLC equipment in the relevant equipment. To better use the PLC technology in the mechanical electrical control device, it is necessary to analyze the various circuits in the design device when designing the schematic diagram and rationally optimize the schematic diagram so as to strengthen the PLC application in the control device.

3.3 Effective control of analog quantities

The analog quantity in this paper is that when the mechanical and electrical control device is running, there will be a quantity which can not be determined and will change constantly. If a product is manufactured in a conventional mechanical electrical control device, it will not be able to have the relevant control technology on the leading edge, and it will not be able to obtain a method that can correctly control its variables. Now, PLC technology can be widely used in mechanical electrical control devices, and the problems above can be well solved. The effective control of the analog

quantity can make the digitization and the analog amount very well converted. In improving the production efficiency of the control device, it can also reduce the impact of the analog quantity on the device.

3.4 Select the right technical type

In mechanical electrical control devices, there are many different types of technologies. Therefore, when applying PLC technology, it is necessary to design a technology reasonably and select the most appropriate technology type. The correct and reasonable technology type is the foundation before design. If you want to ensure the operation of PLC technology, you have to choose a good technology type before design. Compared with the distributed control system, the field bus control system is more applicable and more functional, simple in operation, simple in installation and low in cost. Determining the type of PLC technology is a more systematic task. When selecting, it is necessary to comprehensively consider the problems that may exist in various aspects. Therefore, we must carefully select a technology type to ensure that PLC technology is more reasonable and scientific when applied^[5].

3.5 Design the communication network

The use of PLC technology requires the design of a communications network so that the information between the various data can be transmitted normally. Technical personnel should take into account the environmental conditions in the communications network when designing, and also need to combine the standards of the control device in operation, so as to scientifically and effectively design the communications network, so that the configuration performance of the control device is higher, and the standard configuration during operation is satisfied. With the support of communication network, PLC technology can perfectly control the analog quantity and carry out effective variable prediction, so as to realize the control function of the control device.

4. Conclusion

Generally speaking, PLC technology has been widely used in the mechanical and electrical control devices, and this technology is still constantly updating and progresses, and plays a very important role in the control device. The basic configuration of PLC technology is a very small processor. At the same time, it combines many kinds of technology, such as automatic control technology, computer technology, relay control technology and so on. It has greatly improved the control device of mechanical and electrical. In today's rapid development of mechanical and electrical, reasonable and effective application of PLC technology is particularly important. This article presents a brief analysis of the application and implementation of PLC technology in mechanical electrical control devices, providing a certain reference value for technical personnel engaged in this area of work^[6].

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