

The Application Status and Development of PLC in Electrical Automation

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Abstract: The level of automation of Guodian is getting higher and higher, and the advanced technology is constantly innovating and developing. From the perspective of the current market economy environment, China has entered a period of comprehensive development, and the application value of automation technology in various fields has gradually been recognized. The application of PLC technology in the process of electrical automation development is relatively mature, and has achieved good results, which has laid a stable foundation for the progress of China's electrical industry. PLC technology has many advantages such as strong stability, strong adaptability, wide application range and simple operation. It can reduce various problems in the use of traditional electrical equipment in the application process, and integrate PLC technology into the automation control of electrical equipment. A trend in the future will be electrical business development.

1. Introduction

Programmable Logic Controller (PLC) is compatible with the advantages of traditional control technology, and effectively integrates modern computer technology with automation control technology, and becomes an important support for automation control of electrical equipment. As a complex logic control system, PLC can realize intelligent programming and control of related programs through precise logic operation, and increase the amount of electrical equipment data storage [1], which can promote intelligent control of electrical equipment, simplify operation and promote automation. Control production, improve production efficiency and safety, and play an irreplaceable role in leading the development of electrical engineering automation control. Especially with the continuous innovation and development of modern industrial technology, the application of PLC technology has become the mainstream trend, which will promote the comprehensive transformation of industrial technology level and development mode. From the analysis of application advantages, PLC is more prominent in logic control, analog control, data storage and other functions, and has the application advantages of versatility, flexible design and convenient operation, which effectively compensates for the shortcomings of traditional control technology and can meet different electrical requirements [1]. Application requirements such as closed-loop control, sequence control, and switching control of equipment have wide applicability in the process of electrical engineering automation control. To this end, in-depth study of PLC technology characteristics and design principles, clear its application advantages and strategies in electrical automation control, has important practical significance for promoting and optimizing the application of PLC in various fields.

2. Overview of PLC Technology and Electrical Automation

2.1 PLC technology

PLC technology can also be called an editable controller, which can realize automatic operation of the device through simple programming. The development of China's industrial technology is mainly reflected in the aspects of intelligence and automation. PLC technology is an important embodiment of automation. As a new type of automatic control device, it mainly uses micro-processor as the core, combined with computer technology, communication technology and automation. A variety of

content such as technology to achieve unified management and operation [2]. The IEC has a corresponding definition of PLC technology, which is mainly a new type of digital computing electronic system formed to meet the industrial environment production. Through the programmable memory, combined with the storage function, logic operation, sequence control and other equipment in the system. Implement instruction control to meet multi-faceted and multi-type mechanical production needs. In addition, PLC technology has the following advantages in specific applications: First, the reaction speed is fast, PLC internal auxiliary relay is a very important component, in the application can ignore the node into practice, no need to return to the system fast processing of information can be achieved. Second, safety, PLC technology itself has a good anti-interference function, can meet the normal operation under complex conditions, in the use of safety technology also brings great help to the production work, with the rapid development of PLC technology, The safety of the device equipment is also constantly improving.

2.2 Electric Automation

Electrical automation is a new thing in modern development. Although the research and application of automation technology in China has been around for a long time, the advancement of electrical automation is another breakthrough in the field of electrical engineering, bringing it to a new height. Electrical automation mainly includes automatic control, information processing, electronic operation and other content. At this stage, electronic automation is also developing in the direction of intelligence, automation and miniaturization, which fully exerts the value and advantages of electrical automation in various fields. With the improvement of automation technology, the company's product quality and production efficiency have also improved [2]. This technology can not only meet the accuracy of product quality inspection and information transmission reliability requirements, but also reduce the labor cost and reduce the work pressure in the traditional mode. In recent years, China has invested more and more in electrical automation, which has given great support to the innovation of electrical automation technology and the cultivation of talents in this field.

3. The importance of PLC in electrical automation control

3.1 Increase the storage of electrical automation equipment

PLC technology can be regarded as a small computer system. It can realize the storage and operation control of the system software by compiling relevant programs according to the work requirements. PLC technology has a strong storage function in the application, which can meet a lot of fine work. Storage, and easy to find the required setting information in the history record, through the historical data can further improve the performance of electrical automation equipment, to provide users with satisfactory service, especially for some fault problems, PLC system can also carry out internal data Comparative analysis provides the basis for maintenance and maintenance work [3].

3.2 Promote industrial development

The advancement of electrical automation has evolved with the development of this industry, and has a certain relationship with industrial technology methods and production methods. Under the industrial reform and development in the new era, traditional craft technology has not kept up with the trend of the times, and innovation and change must be made in order to promote the stable development of the modern economy. In this environment, PLC technology came into being, and electrical automation engineering Technology as a carrier plays an important role in the industrial system, promotes the progress of industrial reform, and provides power and support for industrial sustainable construction [3]. Therefore, we need to focus on the innovation and application of PLC technology, continuously improve and optimize the industrial control system, give full play to the advantages of PLC technology, and lay the foundation for China's economic construction.

3.3 Reasonable control of labor costs

PLC technology is gradually becoming systematic and integrated under the application, which largely reflects the characteristics of electrical equipment automation functions, can meet the diversified needs of industrial operating environment, and contribute to the comprehensive development of industrial construction. Under the industrial progress as the pillar of the national economy, it has promoted the improvement of the social and economic level, strengthened the research of PCL technology, optimized the automation control system, adjusted the internal components and system functions, and realized the innovation and development of the technology. of. For industrial production, the rational application of PLC technology can abandon the complexity of traditional manual operation, improve work production efficiency, and achieve rapid development of industrial automation and high efficiency, which is of great significance to the industrial environment [4].

4. Application of PLC Technology in Electrical Automation Control

4.1 Switching control

Switching is a necessary circuit component and the basis and premise for electrical wiring. Most electrical systems add a variety of circuit components to improve the quality of process automation. Based on the circuit components themselves, the vulnerability is strong, and many problems and failures are likely to occur during use, which reduces the safety and reliability of the operation to a certain extent. With the application of PLC technology in electrical automation control, the demand for circuit components is greatly reduced, thereby reducing the operating frequency of electromagnetic relays and effectively improving operational reliability and safety [4]. On the other hand, the circuit components are reduced, which effectively simplifies the running process, reduces the maintenance difficulty, and avoids unnecessary problems. It is worth mentioning that the auxiliary switching quantity is also greatly reduced, allowing the staff to centrally manage the control signals and let the system The scope of application has become more extensive, which has greatly improved operational efficiency.

4.2 Closed-loop control

In the past electrical engineering, the automatic control of the motor was mainly based on manual manual start, and with the in-depth application of PLC technology, it was applied to the automation control, which not only improved the intelligence of the automation control, but also performed Higher stability. From the practical application of PLC technology, it belongs to a closed-loop control mode, which mainly affects the electronic adjustment components and the rotational speed measurement unit in electrical engineering, and then promotes the automatic operation of the entire system. For example, when PLC technology is used to control the motor power pump, real-time monitoring of the operating efficiency of the motor power pump can be realized by PLC technology, and then the corresponding switch can be adjusted according to the operating efficiency, so that the motor power pump can be more High efficiency to operate. It can be seen that the PLC technology has a significant role in the closed-loop automatic control, which is of great help to the improvement of the overall system operation efficiency [5]. Through the effective adjustment of the motor power pump, not only the automation and stability of its operation control are improved, but also the efficiency is greatly improved, thereby driving the overall system operation efficiency.

4.3 Sequence control

At present, most companies use PLC as a sequential controller [6]. For example, thermal power plants use PLC technology as a controller to maximize the automatic control of power generation levels and power generation quality, and improve the power generation efficiency of the power plant and the economic benefits of the enterprise [5]. When dealing with fly ash and slag, PLC technology is the most important sequential control device for thermal power plants. Need to understand the

actual structure and system structure of the automatic control system, including remote control system sensors and field sensors, in order to provide a good application environment for the application and development of PLC technology [7].

4.4 Network control technology

In the network control system, the use of neural network control performance can greatly reduce and locate time, and effectively monitor non-initial speed changes. In neural network control, based on the diversity and complexity of the control structure, forward and reverse learning calculations can be performed. In the network control system, according to the electrical parameters, the speed can be reasonably controlled and calculated, and the signal processing and pattern recognition functions can be fully utilized. Thus, in electrical engineering automation control, nonlinear consistent estimation can play an important role. Both the network control system and the neural network technology have strong complexity and consistency, and the application of relevant control means should be equipped with specialized technical personnel [6]. In the application of network control technology, for enterprises, professional knowledge and technical training should be actively organized, and the professional ability of technical personnel should be strengthened to ensure the efficient implementation of the technology.

5. Development trend of PLC control system in electrical automation control

5.1 The development opportunities needed to transform PLC technology

For the field of electrical automation, PLC has some development opportunities. How to turn development opportunities into opportunities for technological reform is a key issue that PLC technicians need to consider. Professional and technical personnel should comprehensively analyze the relationship between PLC and automation, and PLC in the research process. The case in electrical engineering automation is used as a reference basis to improve the technical standards of PLC automation, and to encourage more technicians to invest in the research and development of PLC to ensure that PLC technology can bring new progress and development opportunities for electrical automation control [3].

5.2 Strengthening the application standards of PLC technology

The electrical engineering industry standard can guide and standardize the application of PCL technology to a certain extent. Therefore, the relevant staff should strengthen the application standard of PCL technology in the electrical engineering industry, improve the uniformity, standardization and feasibility of the standard, and be the PLC technology. Specific applications provide technical guidance on the scope of application and application technology [6]. On the other hand, guiding electrical engineering companies to correctly recognize the importance and practical value of establishing and strengthening application standards, in-depth discussion of the application steps of PCL technology, and the development of specific, targeted technologies, testing and quality PCL application standards.

5.3 Deeply expanding the application fields of PLC technology

The in-depth development of the application level of PLC technology can further improve the application efficiency in electrical automation control. Judging from China's current application in this aspect, relevant theoretical research is obviously lagging behind foreign countries, and there is no objective research basis. At present, the development form of electrical engineering automation control system is studied by PLC technology. This makes the deep development and application of PLC technology more hindered and troubled. Therefore, in the actual construction and development, the power company needs to actively understand the current development status of electrical engineering automation control, and combine its own practical application requirements to make deeper development and research on PLC technology, and some research results in many aspects. Implementation, and need to be put into use after the judgment is correct, which can effectively

reduce the problems in the application [7]. For the application and development of PLC technology, engineers and electrical companies pay attention to application defects and vulnerabilities, explore and analyze with new thinking and advanced new technologies, broaden their thinking, develop PLC technology in depth, and provide guidance for their application.

5.4 Cultivating high-quality professional PLC technical talents

Talents are an important support for the development of the industry. Therefore, it is necessary to focus on cultivating professionals who use and apply PCL technology, and strengthen the cultivation of talent theory and practical skills. At the enterprise level, staff should be regularly organized to conduct special training related to PCL technology. At the national level, we must start to train talents at the macro level, set up PCL technology in higher vocational education, and truly incorporate PCL technology into the vocational education system, so as to cultivate PCL technical talents with strong professional skills, high professional quality and high comprehensive quality [7].

6. Summary

All in all, PLC technology has the advantages of high integration, easy operation, wide range of use and high stability. It has strong application advantages in the field of electrical automation control. Relevant technical workers need to increase the research and development of PLC technology. Improve the technical level of PLC, and effectively promote PLC technology to become the key foundation for improving the automation control level of electrical engineering, realize the value of PLC technology, and lay a good foundation for the healthy development of electrical automation control industry.

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