

# Application of PLC Technology in Electrical Automation Control

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**Abstract:** At present, PLC technology is widely used in the automation of electrical engineering, so it receives better application effect. The application of PLC technology in automatic control of electrical engineering is analyzed. This paper analyses the PLC technology in the control of electrical engineers. Because of the development of science and technology, it promotes the rational use of PCL technology. It is necessary to understand the outline and main advantages of PLC technology, understand the application of computer, and realize electrical engineering and its application. A thorough study of automatic control systems. By analyzing the application of PLC technology and its automatic control in improving the production and quality of industrial departments, combining the characteristics and advantages of PLC technology, it has made contributions to the future development of PLC in the direction of electrical engineering.

## 1. Introduction

With the continuous progress of modern science and technology, information technology has been widely applied in all walks of life, and achieved good results. PLC technology effectively combines the main advantages of traditional technology with the characteristics of modern science and technology, and promotes the rapid development of China's electrical automation. The application of automatic control PLC technology in electrical engineering is simple, and the work efficiency is greatly improved. The automatic control production is basically realized.

PLC technology is the application of modern electrical engineering, and it is the process of stage expansion and development. In order to realize the control technology level of electric automation system, it is necessary to avoid the limitations of existing technology and combine modern PLC. The gap between technology and traditional technology reflects the effect value of electrical engineering. It's not just PLC. It's excellent in technology. It emphasizes electrical engineering from application program and thinking mode. Therefore, it is necessary to continuously improve the automation level of electrical technology through PLC technology and lay a solid foundation for the future development of electrical industry [1].

## 2. Significance and Main Features of PLC Technology

### 2.1. Significance of PLC technology

PLC technology is a logic controller that can be edited. PLC technology can effectively improve the safety of industrial environment by simulating and programming industrial related data. PLC technology only needs to complete simple trapezoidal commands, and does not need professional programming language. Compared with traditional technology, PLC technology effectively improves reliability, reduces energy consumption, and fully embodies micro-processing technology.

### 2.2. Main characteristics of PLC technology

PLC technology has excellent application process versatility and flexibility, can use various software to control various tasks. General relays can not reasonably control new tasks, but PLC can control them. At the same time, the safety and reliability of PLC technology are very high. This technology has the ability of self-diagnosis in the process of application, so it can ensure the normal operation of the PLC system and prevent system problems. PLC technology also has strong environmental adaptability. Regardless of the working environment, this technology can play a

useful role, anti-electromagnetic interference ability and strong impact resistance.

### 2.3. Combined with the application of electrical engineering, to analyze the advantages of PLC

From the point of view of PLC technology [2], his overview features clearly define the effectiveness of electrical engineering in practice and determine its dominant position. In the whole auxiliary electrical connection, the operation can be improved through a variety of operating conditions, and the rationality is also effectively controlled. Although the degree has increased many difficulties, the main application of PLC technology has been basically improved.

For electrical engineering, it needs to be perfected through reasonable design requirements. This technology mainly improves storage system and rational programming through computer, so in the program, it can directly reduce link design and effectively reduce manpower. Cost reduction can effectively reduce the source of design.

### 2.4. The internal structure of the application of PLC technology is mainly based on auxiliary relay.

At the same time, remove part of the internal connecting wire, in this case, the relay action. Compared with the application of mechanical relay in the past, PLC has neglected the node time sufficiently. PLC we do not need to consider the return value. Importance of PLC technology in the automatic control system of PLC electrical equipment to complete the scientific processing of internal information. The application of PLC technology can greatly improve the interference and prevent energy in the system. In the face of complex operation environment [3], PLC technology can satisfy the user's application program. In order to ensure the safety and stability of production, the main factor of wide application of PLC is to improve the safety level of PLC through continuous research and innovation of PLC technology, which can ensure electronic equipment in various environments. Safety measures implemented. The electric automatic control system based on PLC technology is relatively simple and adopts a simpler and more intuitive instruction mode. In this mode, the difficulty of traditional control system operation can be alleviated, and the staff is very convenient. Quickly learn operating skills in a short time to avoid equipment failure, so as to improve the operational efficiency of electronic equipment and provide stable basic support for enterprise production.

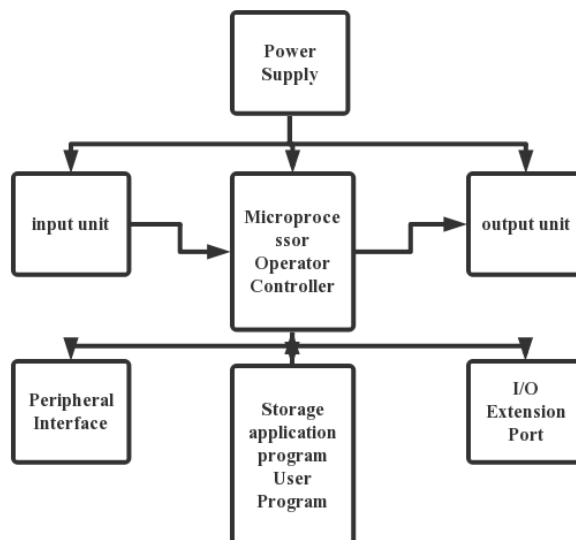


Fig.1. PLC structure diagram

### 3. Necessity of Automatic Control PLC Technology in Electrical Engineering

With the rapid development of science and technology, the electronic automatic control system is not only reforming and innovating. PLC technology is one of the ways to adapt to social

development. Information technology has been applied in all walks of life in today's social development. Of course, this is also effective for the electrical automation industry [4]. The application of PLC technology in electrical engineering automation is an important manifestation of information technology. In the specific application process, the characteristics of faster computer and the storage capacity of electrical equipment are fully integrated, which makes electrical engineering run faster, operate more intelligently and distribute more widely. Promote the progress of electrical engineering automation.

### **3.1. Application of PLC technology in electrical automation control**

PLC technology was put forward by the United States in 1960, and has experienced 50 or 60 years of development. With the continuous improvement of PLC technology, new progress has been made in the application of this technology in electric automatic control, and good economic benefits have been produced in the application process.

### **3.2. Application of PLC technology in sequence control**

With the continuous development of electrical automation [5], PLC technology has been widely used in electrical automation control. The application effect of sequence control is better, and it can be used as sequence control of electrical engineering automation. For example, using PLC technology as sequential control of thermal power plant can effectively control slag and fly ash. In the process of electric automation control, we must improve the production efficiency and give full play to its economic benefits. Therefore, the application of PLC technology in sequence control must be realized through scientific and reasonable design and combination. Generally speaking, we must pay attention to the following three aspects. The first aspect is the field sensing control; the second is the remote control; the third aspect is the master station level control. Do well in these three aspects of control, better play the main role of PLC technology in sequence control, play a good performance, effectively improve work efficiency.

### **3.3. Application of 3PLC technology in switching volume control**

In the field of electrical engineering automation, PLC technology can be used as programmable memory in the operation of virtual relays. PLC control system needs a long reaction time in the turn-on/cut-off control of conventional relays, so it is difficult to control relays more effectively during short circuit protection. This problem is one of the main problems in the application of PLC technology in the process. Usually, an effective combination of PLC technology and automatic switching system can be used to control problems. By using this method, the response speed of the system can be effectively improved, and the work efficiency can be improved [6]. The application of PLC technology of switch control is mainly reflected in the application of this method.

### **3.4. Analysis of rational application of closed-loop control**

There are many problems in electric automatic control system. In order to improve diversification, it is appropriate to carry out electrical automation analysis and collection method adjustment. The most common mode is startup mode, and from manual to automatic processing mode. Closed-loop control is the most commonly used PLC technology in electrical engineering automatic control.

In the closed-loop control of PLC technology, the main problems involved are the measurement and adjustment of unit and speed in order to ensure the development of electrical engineering speed and make the realization of electrical regulator reasonable. For example, in the electric automation control system, the traditional control is mainly operated manually. However, in manual operation, it is necessary to improve the utilization of equipment through template [7], and the overall operation efficiency is relatively low. However, in the automation part, it is necessary to switch on the state of the power supply and improve the efficiency of the controller.

## **4. Application Strategy of PLC Technology in Electrical Automation Control**

### **4.1. Constructing perfect application standard of plc technology**

The application degree and content of PLC technology in different fields are quite different [8]. For the application of this electronic automatic control technology, it is necessary to build a more complete application standard. In the application process of unified standard, the application of PLC technology can be controlled to avoid the problems caused by irregular operation of PLC technology in electrical automatic control, so as to improve the application effect of PLC technology. On this basis, electrical engineering-related enterprises should fully communicate and cooperate, but the application of standards. In order to determine the practical application stage, technical standards and quality inspection standards determine the application of PLC technology.

### **4.2. Improve the research and development speed of plc technology**

In order to make the application effect of PLC technology better [9], it is necessary to combine the actual needs of social development with technical research and development. In this process, the development status of PLC technology and the development needs of Electrotechnics are effectively combined. The application of PLC technology in theory and practice is improved, and the practical effect of application is analyzed and discussed. The application of PLC technology can be popularized by innovating the technology of PLC and dealing with the problems in the automatic control of PLC technology scientifically.

### **4.3. Strengthen the training of plc technical ability**

In the application of PLC, the requirement of ability is not only to have professional theoretical knowledge, but also to have corresponding professional skills. In the enterprises of electrical engineering, the professional training of professional personnel and the explanation of theoretical knowledge and practical skills of PLC technology are carried out regularly. It is necessary to give full play to the staff's skills and promote them through the improvement of the staff's professional level. The effective use of PLC technology in electric automatic control [10].

## **5. The Future Development Direction of PLC Technology in Electrical Engineering and Automation Control**

In order to improve its diversification, PLC technology needs to combine electrical products, improve the application environment of design and manufacturing and play its role. In order to give full play to its role, followed by electrical engineering and automation, it is necessary to improve the coordination between machines and people to meet the conditions of automatic control.

Electrical engineering PLC technology needs to import the professional knowledge of the industry. In order to improve the huge PLC electrical control system, the computer and memory editing are combined, so that the PLC technology can cover a wide range. In order to adapt to technological progress, it is necessary to integrate computer application and system control in the whole development process to effectively control the layout and distribution, so as to make the application of electrical automation control system intelligent and safe.

## **6. Conclusion**

Generally speaking, PLC technology has a good application prospect. With the continuous development of information technology, the application of PLC technology in electrical automatic control will be continuously improved and developed. The application of PLC technology can solve the problems existing in the existing technology. In the continuous exploration of this technology, the application effect of PLC technology will be improved.

## References

- [1] MIURA Kento, MATOBA Shogo, OGONUKI Narumi, Ito J, Kashiwazaki N. Application of auxin-inducible degron technology to mouse oocyte activation with PLC $\zeta$ . *Journal of Reproduction & Development*, 2018, 64(4).
- [2] Ren M Z, Zhang J S, An J M. Investigation of Mach-Zehnder interferometer properties based on PLC technology. *Optoelectronics Letters*, 2018 14, (3), 170-174.
- [3] Wang Q. Application and Realization of PLC Technology in Mechanical Electrical Control Device. *Modern Manufacturing Technology & Equipment*, 2017.
- [4] Calderon, C. A, Gutierrez, Juan Pablo, Alvarez, Leonardo. [IEEE 2018 13th Iberian Conference on Information Systems and Technologies (CISTI) - Cáceres, Spain (2018.6.13-2018.6.16)] 2018 13th Iberian Conference on Information Systems and Technologies (CISTI) - PLC-based temperature controller applied to a distill, 2018, 1-7.
- [5] Barfoot P L C, Steiner S H, Mackay R J. Bias/Variance Trade-Off in Estimates of a Process Parameter Based on Temporal Data. *Journal of Quality Technology A Quarterly Journal of Methods Applications & Related Topics*, 2017, 49 (4), 301-319.
- [6] Righini D, Tonello A M. New Findings about Multi Conductor Noise in Narrow Band PLC. 2018.
- [7] Elamurugan P, Vinothbresnav K, Abirami D, Suhirdham K G. Automatic Material Segregation Using PLC. *International Journal of Engineering and Technology*, 2018, 7, (2.24).
- [8] Wang J, Jia Y, Guo L, Liu P, Hall T J, Sun D G.. Improved silica-PLC Mach-Zehnder interferometer type optical switches with error dependence compensation of directional coupler. *Optics & Laser Technology*, 2017, 89, 208-213.
- [9] Chang R K, Liu H. Design of monitoring system for mail-sorting based on the Profibus S7 series PLC. *Proceedings of the Spie*, 2017, 322, 103220T.
- [10] Geerts W M, Steenbeek H W, Geert P L C V. Effect of Video-Cases on the Acquisition of Situated Knowledge of Teachers. *International Education Studies*, 2017, 11 (1), 64.