

# Application of Intelligent Technology in Electrical Engineering Automation

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**ABSTRACT.** In recent years, the development of science and technology has been very rapid, and intelligent technology is also a modern technological method that people are paying attention to. The development of the electrical engineering industry has made the application of intelligent technology to automatic processing technology the main research direction, which can combine the basic characteristics of electrical engineering to further give play to the advantages of intelligent fault control and intelligent project design, and fully meet the development needs of the electrical engineering industry. With the development of electrical engineering, in the operation of electrical systems, it is necessary to innovate automation engineering technology according to specific production requirements, and at the same time integrate intelligent technology to strengthen system operation efficiency and technical level, and promote the intelligent and modern development of electrical enterprises. This article mainly analyzes the advantages of intelligent technology and proposes its application in electrical engineering automation.

**KEYWORDS:** Electrical engineering automation, Intelligent technology, Application strategy

## 1. Introduction

In the field of computer science, intelligent technology is a major branch, a modern technical means that simulates and extends human intelligence, and the rapid development of computer technology and modern information technology, intelligent technology is currently in various fields and industries. It has more and more common applications and also exerts significant advantages for electrical automation control. The organic integration of electrical engineering automation technology and intelligent technology can further improve the effectiveness of production control and improve product production quality. It is of great significance to the expansion of the application range of electrical engineering automation and further promotes the innovation and development of electrical engineering automation technology.

## 2. Brief Description of Smart Technology

In the 1950s, the concept of artificial intelligence began to come into people's sight. In the decades of development, artificial intelligence technology has become more and more mature, both theoretically and technically. It has also begun to be applied in various fields. The core of artificial intelligence technology is computer technology, and computer technology is currently widely used in most fields, which also paved the way for the popularization of artificial intelligence technology. Computer artificial intelligence is still the key research direction. Researchers use computer programming to realize the full integration of electrical engineering automation control and intelligent technology. This is a major breakthrough for intelligent technology and electrical engineering automation control technology. The improvement of engineering automation control efficiency, the control of production costs, and the innovation and development of the industry have all brought strong momentum.

## 3. Analysis of the Advantages of Smart Technology

Intelligent control usually needs to be implemented in different ways, but some artificial intelligence controllers such as fuzzy neural and genetic algorithms are non-linear function approximators, which can realize the overall understanding and facilitate the comprehensive development of control strategies. The advantages of artificial intelligence function approximators are also diverse. Under most conditions, it is difficult to fully grasp the dynamic equation of the control target. Generally, the controller may also have uncertain factors in the design of the control

target model. The design of the intelligent controller does not depend on the model of the control target. Combining the difference in fall time and robustness, the artificial intelligence controller can be adjusted to improve performance, such as the efficiency of the fuzzy logic controller and the traditional PID controller in the fall time. It is about 4 times higher, and the rise time is 2 times higher than the efficiency of the PID controller. At the same time, the artificial intelligence controller also has the advantage of flexible adjustment. It can be designed based on response data and language methods. It also has obvious uniform characteristics. It can be effectively estimated when inputting unfamiliar data and is less affected by the driver. During the fuzzification and defuzzification, if you select the rule base or adapt the fuzzy neural controller, you can make the determination more quickly<sup>[1]</sup>.

#### 4. Third, the Application of Intelligent Technology in Electrical Engineering Automation Control

##### 4.1 Application in Fault Analysis and Diagnosis

The main application performance of intelligent technology in electrical engineering automation control is fault analysis and diagnosis. If the electrical engineering automation control system operates for a long time, it is prone to faults. The traditional equipment faults usually can only be manually experienced by maintenance personnel. Judgment method for diagnosis and processing is not only inefficient, but also difficult to fully guarantee the accuracy of diagnosis. The application of intelligent technology can accurately diagnose faults. If a fault occurs during the operation of the equipment or the operating parameters are abnormal, the system will stop the equipment in a reasonable way and send an alarm. For example, the power engineering system can self-diagnose the operation of the equipment after applying intelligent technology. For example, the diagnosis of a transformer can analyze whether the equipment is malfunctioning according to the internal gas content status, and use intelligent technology to help determine the possible failure. The point location effectively reduces the troubleshooting and diagnosis time of maintenance personnel, and guarantees the accuracy of fault maintenance.

##### 4.2 Application in Electrical Automation Engineering

Because the operation of electrical engineering equipment is difficult, and the staff may face certain dangers in the operation, the application of intelligent technology can effectively replace manual operation, avoid the safety hazards caused by dangerous operations, and greatly improve the operation of the equipment. Efficiency. Intelligent technology has also played a role in promoting the development of electrical engineering automation control, improving the intelligent level of the system, realizing real-time, remote and automatic control of equipment, and further improving the control of personnel over equipment, simplifying the control difficulty is reduced based on the operation process. Intelligent technology can realize the intelligent control of electrical engineering. Among them, PLC technology is a more widely used technical means in the intelligent control of electrical engineering automation. PLC technology can effectively replace the traditional electromechanical control technology and realize the intelligent control of electrical engineering automation. The reasonable application of the system can also improve the coordinated operation of the production process and improve the intelligent control level of the grid power supply system. PLC technology can also effectively replace the operation of electrical engineering components, and can achieve automatic switching of the grid power supply system. The specific hardware structure is shown in Figure 1<sup>[2]</sup>.

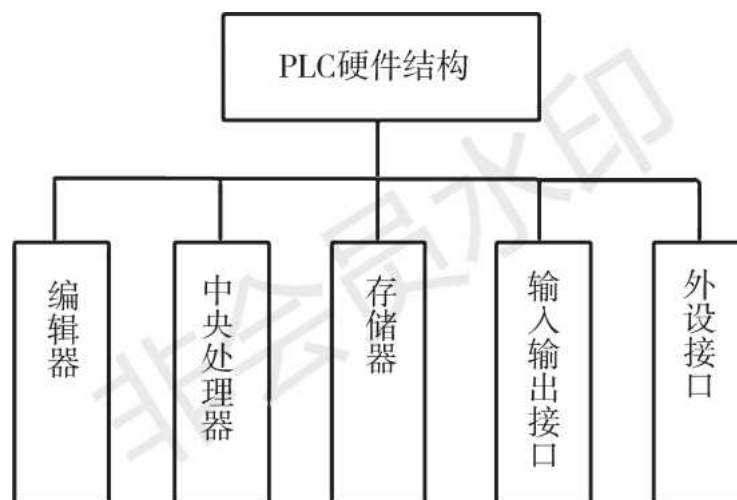


Fig.1 Plc Hardware Structure Diagram

### **4.3 Application in Electrical Engineering Automation Design**

For electrical engineering automation systems, system design is undoubtedly the most important stage, and it is also a key link that affects the overall value of the system. The use of intelligent technology gives full play to its own advantages, especially the electrical engineering automation control technology that is facing the comparison with foreign developed countries. In the current big gap, the application of intelligent technology has further expanded the development space of technology and played a key role in the development of my country's electrical engineering automation control, making the research on intelligent technology and its application more and more in-depth. According to the analysis of the current development status of China's electrical engineering automation projects, the system structure is becoming more and more complex, making the internal design of the system more difficult, and there are new requirements for the technical level of designers, such as partial circuit knowledge and electrical knowledge, and Automation knowledge needs to be proficient. Designers must ensure the reliability of design work and ensure the feasibility of design schemes. Therefore, they need to focus on the professional knowledge involved in electrical engineering automation control. The application of intelligent technology also requires designers to continuously deepen their understanding. The depth of research on intelligent technology and its applications.

For the design of electrical engineering automation control, the application of intelligent technology can make the system design have more obvious advantages. The traditional electrical engineering project design is usually manual operation design, although the application of this method can meet the operation of the traditional electrical system. However, in terms of the current development trend and demand of electrical engineering automation, human design gradually cannot meet the design requirements in terms of details and efficiency. This requires designers to flexibly apply computer technology to assist design and use the method of constructing models. Strengthen the accuracy and scientificity of the design process. For some precise parameter design, professional design software is also needed to ensure the feasibility of the design. The comprehensive application of computer software is also a form of intelligent technology application, intelligent software. The use of it is also a feasible strategy for electrical engineering automation design<sup>[3]</sup>.

## **5. Conclusion**

In recent years, the rapid development of science and technology has led to the deepening of research on intelligent technology. Intelligent technology is of great significance to the modernization of human society and is also a new milestone in the development of human science and technology. At present, most companies have realized the importance of modern information technology to the development of the industry, actively turning to modern development, and actively introducing modern technology, application and integration of modern technology, and the organic integration of intelligent technology and electrical engineering automation control is important for the development of enterprises. Role, while promoting the stable development of enterprises, further improving the production efficiency and benefits of enterprises, and strengthening the competitiveness of enterprises.

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