**APPLICATION AND DEVELOPMENT OF ELECTRICAL AUTOMATION TECHNOLOGY IN LIGHTING ENGINEERING**

Greefrath Neugebauer

*Institut für Mathematik, Universität Kassel, Heinrich-Plett-Str. 40, 34132, Kassel, Germany.*

**Abstract:** With the development of industrial automation, the application scope of electrical automation technology is also expanding. Applying electrical automation technology can improve electrical. The intelligent level of control can help various control systems achieve automatic chemical control. Lighting projects usually use natural light or artificial lighting systems to fully Meet the lighting needs in specific environments. As urban lighting requirements continue to increase With the changes, people have put forward higher requirements for light brightness, color temperature and light environment, and urban lighting projects have begun to develop in the direction of modernization. In this situation, Applying electrical automation technology to urban lighting projects can meet the ever-changing urban lighting needs and provide assistance for the modernization of cities. The article studies the application of electrical automation technology in lighting engineering.

**Keywords:** Electrical automation technology; Lighting engineering; Automation control; City lighting

**1 OVERVIEW OF ELECTRICAL AUTOMATION TECHNOLOGY AND LIGHTING ENGINEERING**

Electrical automation technology has been widely used because of its many application advantages. Used in different areas to meet specific construction needs of electrical engineering. exist The application of electrical automation technology in lighting engineering can make more efficient use of Use lighting functions to improve the performance of lighting equipment in all aspects. here On top of this, it can better meet the actual use of lighting projects. need.

**1.1 Electrical Automation Technology**

In the early days, electrical automation technology was mainly used to study the production of electrical energy, Transportation and distribution. With the continuous improvement of scientific and technological level, electrical automation technology has been widely used in industry, agriculture and construction fields. The development level of electrical automation technology can reflect the country 's economic strength and scientific and technological level to a certain extent. In the future development process, Electrical automation technology will be further optimized and improved, and its application The scope will also continue to expand and the development of modern engineering technology will be accelerated.

**1.2 Lighting Project**

It has comprehensive characteristics. Lighting engineering involves many contents, mainly Including light sources, lamps and control systems [1]. After a long period of development, lighting engineering has gradually changed from a model that only pursues lighting brightness to a model that requires full consideration of the actual situation of the space, reasonable configuration of brightness and color temperature, and a harmonious lighting effect. Today, lighting projects can be divided into two categories: indoor lighting and outdoor lighting. Among them, indoor lighting It refers to the lighting of buildings such as residences, offices and classrooms; outdoor lighting is Refers to the lighting in squares, scenic spots, parks and other areas [2].

**2 APPLICATION REQUIREMENTS FOR ELECTRICAL AUTOMATION TECHNOLOGY**

In order to better meet the relevant requirements of remote control and local control, it is necessary to design the electrical schematic diagram according to the actual characteristics and relevant requirements of the project. Based on the design of electrical supporting hardware, scientific and reasonable design of electrical components, including circuit breakers and relays, button indicators, touch screens, etc. [3].

**2.1 Remote Control**

With the support of electrical automation technology, technicians can Remotely control related equipment through touch screen operation and other methods, and you can understand the overall operating status of the equipment through remote monitoring. This control mode does not require manual participation and can minimize the investment of manpower and material resources. investment to help relevant companies save production costs.

Remote control has the characteristics of flexibility and can be adjusted according to the actual situation. Optimize and adjust to ensure the accuracy of the information obtained [4]. Although remote control has many application advantages, in specific applications, Remote control will be affected by traffic speed. If the traffic speed is low, Will affect the efficient transmission of data. In order to ensure the speed of data transmission, It is necessary to continuously improve the communication speed and achieve a more ideal remote control effect on this basis.

**2.2 Local Control**

Local control requires switching through the local remote switch on the touch screen. In addition to switching on the touch screen, you can also switch through relevant buttons on the control cabinet. The most significant advantage of local control is its ability to provide strong support for workers in on-site operations. in opposition When debugging and repairing equipment, staff can provide on-site control ways to solve related problems [5].

**3 THE APPLICATION VALUE OF ELECTRICAL AUTOMATION TECHNOLOGY**

**3.1 Improve Operating Level**

Electrical automation technology is advanced and can manage scientifically and rationally. Management lighting system, which is incomparable with traditional electrical technology. electric Automation technology can protect lighting systems and equipment to the greatest extent, making The system and equipment are always in stable operation; lighting equipment can be improved equipment’s self-control capabilities and overall efficiency, reducing the number of failures and solving Solve related problems existing in lighting equipment and extend the overall performance of the lighting system Service life [6].

The application of electrical automation technology can improve the performance of lighting systems in different environments adaptability to the environment and facilitate staff to flexibly modify the system operation; it can simplify the original complex operation process and bring convenience to operators. for greater convenience. For example, combining remote monitoring systems with electrical automation The comprehensive integration of technology enables all-round monitoring of all lighting System equipment to optimize and improve the monitoring system. This can both It can improve the work efficiency of lighting projects and carry out related work more efficiently. Related management work [7]. It can be seen that the reasonable application of electrical automation technology can Enough to promote the development of lighting engineering related technologies.

**3.2 Promote Energy Conservation and Efficiency Improvement**

Modern lighting projects use a large number of equipment. Different lighting projects require different types of lamps, such as fluorescent lamps, LEDs, etc. Lamps etc. Fully integrating advanced electrical automation technology, you can fully utilize the While brightening the engineering light source, we can also achieve the goal of saving energy.

For example, various switches will be installed in lighting projects to control the turning on and off of lamps. [8]. Traditional switches require manual physical touch operations. In some large-scale lighting projects, manual switch control projects The quantity is very large. In this regard, electrical automation technology needs to be applied to automatically control the switch by establishing a virtual application. this This can not only efficiently control the turning on and off of lamps, but also reduce energy consumption. Diversified control methods can improve the efficiency of lighting projects, At the same time, it maximizes the lighting effect to bring people a better lighting experience. [9].

**3.3 Reasonable Application of Electrical Automation Technology**

Reasonable application of electrical automation technology in the development process of lighting engineering Technology can improve the reliability of electrical lighting systems. Applied electrical automation Chemical technology can efficiently debug and arrange lighting projects, and can reasonably adjust Adjust the brightness, temperature and various lights of the lighting project to achieve the best lighting effect and make the lighting project more stable. Reasonable application of electrical automation Chemical technology can also solve the problem of energy loss and improve the efficiency of energy use. Rate. If distributed measurement and control technology is applied to protect lighting projects, it can ensure that lighting Ming engineering achieves a more ideal lighting effect.

**4 THE SPECIFIC APPLICATION OF ELECTRICAL AUTOMATION TECHNOLOGY IN LIGHTING ENGINEERING APPLICATION**

With the continuous development of the times, the number of lighting projects is increasing. Nowadays, most of the electrical equipment used in homes have high-power characteristics, which will cause greater work pressure on the home power system. In order to meet people's growing lighting needs, the development of lighting engineering In the process, it is necessary to carry out energy-saving construction of lighting projects and continuously increase the number of electricity network system coverage [10].

In order to further improve the reliability of the lighting system, it is necessary to do a good job Optimize the lighting project, rationally apply electrical automation technology in various lighting projects, and form a new control system based on the original one. Relevant surveys show that the power consumption of traditional lighting systems generally accounts for 1% of the total power consumption. 10% about. If the utilization rate of electric energy can reach 100%, Will fundamentally solve the problem of power loss, thereby maximizing savings Approximate power. At present, the low power utilization rate of lighting systems is mainly due to the unreasonable selection of lamps. In this regard, it is necessary to apply electrical automation technology to improve the application effect of lamps while rationally selecting lamps. To reduce the power consumption of the system and achieve a more ideal lighting effect.

**4.1 Soft Switching Applications**

In lighting projects, switches are the most important component. On/off The main function is to control lighting fixtures. As the level of science and technology continues to improve With progress, lighting switch technology has been optimized and innovated. Among them, soft switch is a switch that uses electrical automation technology. It is different from traditional switches. There is a big difference. Soft switch is a virtual program. After application, The power loss can be minimized during the process. Applying a soft switch can Control lighting equipment more efficiently and improve the quality of lighting services. although Although soft switching has many application advantages, it also has the disadvantage of increasing noise. question.

When applying soft switching, resonance can be introduced into it to control Current and voltage, so that the switch is always in a zero voltage state before it is turned on. The voltage also quickly drops to zero after the switch is turned off. This can avoid the problem of overlapping current and voltage, and can reduce energy consumption while reducing Light grid pressure. The turning on and off of lamps is a constantly changing process, while the turning on and off of traditional switches adopts a fixed mode, which is inconsistent with the turning on and off characteristics of lamps. Soft switch on and cutting off process is a gradual change process, consistent with the opening and closing characteristics of the lamp, which can avoid the impact of the lamp on people in a dark environment. impact on their vision.

**4.2 Applications of Fiber Optic Lighting**

The optical fiber in fiber optic lighting refers to the optical fiber, which is spun from glass. Conductor as the main material. The advantage of optical fibers is that light travels through them When losing, it does not change itself. Optical fibers in the field of communications is widely used, can improve data transmission efficiency, and can The development of communication technology provides favorable conditions. In fiber optic lighting, light guides The main function of the fiber is to transmit light to the corresponding location.

The most significant application advantage of fiber optic lighting is if it occurs in the application If there is a fault problem, the relevant parts can be replaced in time, and the whole replacement process is very Very simple. The projection host of fiber optic lighting can be separated during application. Therefore it can be repaired and replaced at any time. Moreover, the optical fiber has a long service life, the equipment is small in size, and the investment required to make it is The book is also relatively small. In fiber optic lighting, light and electricity are in a state of separation, so it is suitable for use in places with a high risk factor. For example, using fiber optic lighting in swimming pools or flammable and explosive places can achieve good lighting effects without causing safety accidents. In addition, fiber optic lighting is applied It can realize automatic color change and adjust the lighting color according to the needs of the external environment, making it very suitable for landscape lighting.

**5 DEVELOPMENT PROSPECTS OF ELECTRICAL AUTOMATION TECHNOLOGY AND LIGHTING ENGINEERING**

With the continuous development of the times, people's usage needs are constantly updated. The lighting system will continue to undergo technological upgrading in the future development process. In order to meet people's diverse use needs. Traditional electrical technology cannot meet people's needs, and electrical automation technology needs to be actively developed. Electrical automation technology will change in a scientific and standardized direction, and will develop in a diversified direction from traditional single electrical automation technology.. On this basis, electrical products can better adapt to the actual use needs of different environments.

In the future development process, electrical automation technology will be closely related to computing Computer technology and Internet technology will be more deeply integrated to accelerate The speed of development in various fields. The integration of electrical automation technology and Internet technology is an inevitable trend in future development. The integration of Internet technology can In order to improve the application efficiency of electrical automation technology, electrical automation technology will transform in the direction of high energy and intelligence, and has good development prospects. Relevant technical personnel need to combine the characteristics of the development of the times with relative Optimize and improve relevant technologies, and continuously expand the application scope of technologies. This will accelerate the pace of development in various fields in our country.

**6 CONCLUSION**

To sum up, in the context of the new era, if you want to promote the rapid development of lighting engineering, you need to fully apply electrical automation technology. electrical auto The application of automation technology can provide strong technical support for the development of lighting projects, achieving green lighting while reducing investment costs. now, There are still some problems in the development process of lighting engineering. How to solve the existing problems has become a key research content for relevant enterprises. In the future development process, electrical automation technology will be further optimized and Perfect, its application scope will continue to expand, thereby promoting various fields in our country of rapid development.

**COMPETING INTERESTS**

The authors have no relevant financial or non-financial interests to disclose.

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