

Application and Development Trend of Electronic Automatic Control System

Shilin Zhang^{1,2}

¹College of Aerospace Science and Engineering, National University of Defense Technology, Changsha, Hunan 410073, China

²Hunan Provincial Key Laboratory of Image Measurement and Vision Navigation, Changsha, Hunan 410073, China

hjaq666@126.com

Keywords: Electronic automatic control system, Application, Development trend

Abstract: Owing to the rapid progress of science and technology, people's living standards have been significantly improved, and the requirements of economic and social development for science and technology are higher and higher, and the performance of domestic electronic products is also developing in the direction of automation and intelligence. Electronic automatic control system is widely used in various fields, especially in aerospace industry, science and technology industry and agriculture. Although we haven't seen the electronic automatic control system close up and have a deeper understanding of its internal structure, it has brought more convenience and contribution to people's work and life, and provided important development power and high-quality services for human development. This paper first gives a brief overview of the electronic automation control system, then analyzes the application of the electronic automation control system, and finally looks forward to the future development trend of the electronic automation control system.

1. Introduction

The biggest working advantage of electronic automatic control system is that it has the functions of automation, intelligence and informatization. It can automatically analyze and integrate the collected information, and issue corresponding processing schemes and instructions for the integrated information, so as to realize the remote operation and programmed management of electronic and mechanical equipment, save a lot of human and material resources for the enterprise, and is conducive to the long-term progress of the enterprise. Meanwhile, with the continuous change of the times and the progress of science and technology, the electronic automatic control system has also realized continuous improvement and innovation, which is more in line with the development needs of modern society. Its structure has realized the operation and management of three control systems, closely following the forefront of the social trend. This paper analyzes several common application ways of electronic automatic control system, and explores its future development direction, hoping to provide more reference basis for the further progress of electronic automatic control system in the future.

2. Overview of Electronic Automatic Control System

Electronic automatic control system is the achievement of the continuous development of China's modern science and technology. It is not only an important part of China's current science and technology, but also points out its development direction for the further progress of chemical industry in the future. It has played an indelible key role in the development of social economy and enterprises. The electronic automatic control system realizes the automatic control of mechanical equipment, effectively reduces the enterprise cost, helps the enterprise reduce the labor force and significantly improves the accuracy of mechanical equipment. At the same time, it speeds up the transmission speed and enhances the security of information, which is conducive to the long-term development of enterprises. In addition, the emergence of electronic automatic control system also

effectively reduces the incidence and possibility of dangerous accidents in enterprises, and improves the safety and stability of mechanical equipment in enterprises. It has laid a solid foundation for the development of China's information, automation and intelligent automation industry.

Common electronic automation control systems mainly include DCS control system and PLC controller. Among them, DCS control system was that in the mid-1970s, in order to achieve decentralized control of the enterprise's production process, some enterprises implemented centralized monitoring, management and operation of the internal work of the enterprise, which is called decentralized control system ^[1]. This decentralized control system integrates advanced network, Internet information technology and computer technology, which can be described as the integration of various technologies. However, due to its powerful functions, it has attracted the attention of some international enterprises. The enterprises carried out deeper research and exploration and effectively applied the research results to the product production and development of their own national enterprises, which not only effectively improves the function of their own control systems, but also improves the comprehensive competition level and overall economic competitiveness of enterprises. However, the closed problem of its own system has affected its development. Some configuration methods and man-machine interfaces are still deeply loved by the broad masses of the people, which is in line with their application habits.

In addition, PLC means the abbreviation of programmable logic controller, which was made in the United States at the end of 1960s. It was first applied to the product production and guidance process of the automotive industry, mainly using simple switch system model control. With its continuous development, in the quantity closed-loop control test of simulated environment, another quantity closed-loop control function was found, which made it constitute a control network system of PLC master-slave station. Nowadays, PLC is no longer limited to the automobile industry. It has also been widely used in the fields of metallurgy, electric power industry and light industry, and has played a vital role in its enterprise development and economic profit promotion.

3. Application Analysis of Electronic Automatic Control System

3.1 Application in Electric Power Enterprises

In recent years, owing to the progress of science and technology, the power industry in the new era has realized the automatic management and control of power supply, used the automatic control system to replace the previous manual mobilization control of mechanical equipment, effectively integrated the Internet information network technology and computer technology into the control and dispatching of modern power grid, reduced the work cost, improved the work efficiency and quality, and ensured the stable and safe operation of power enterprises. The new generation of automatic power system is called intelligent power grid. Only in this way can the power grid with large electric load and working frequency meet people's increasing demand for power system ^[2].

3.2 Application in Agriculture

The electronic automatic control technology is effectively applied to the field of modern agricultural production, realizing the automatic, information and intelligent management of agricultural machinery and equipment, effectively improving the performance of modern machinery and equipment, and accurately calculating and controlling the water, fertilizer, humidity and temperature standards required for crop production. It is more conducive to the scientific growth of crops and the improvement of crop output. It effectively reduces the production cost of agricultural industry, scientifically and effectively solves the long-standing shortage of agricultural labor in agricultural development, and effectively improves the work quality and efficiency. At the same time, it strengthens the mechanized and intelligent management of crops, eliminates the problems of yield reduction and crop damage caused by insufficient or excessive fertilization and sprinkling water of crops, realizes the accurate management of chemical fertilizer and sprinkling water, reduces the waste of resources and improves the rational utilization rate of resources.

Facility agriculture is more suitable for large-scale agricultural industrial bases, so that its performance and value can be brought into full play, and the work efficiency, quality and scale can be improved, and the cost of early investment can be directly proportional, and the economic benefit can be maximized. This kind of facility agriculture only belongs to a very small part of agricultural Internet technology. Its emergence realizes the construction of dispatching platform and the detection and management of agricultural conditions by agricultural operations.

3.3 Application of Simulation Technology in Computer

With the development of the times, the electronic automatic control system is constantly improved and upgraded, and the internal distribution system and storage capacity are also increasing. It can store and process a large amount of data information at the same time, which provides a large number of implementation conditions and foundation for the later computer simulation production. Technical researchers can conduct more in-depth research and analysis on the working principle of electronic automatic control system through computer simulation principle, which has very important research value and significance. The simulation production of data plays a vital role in the later large-scale mathematical modeling. It is directly related to the update and upgrading of product performance and job participation, and is more suitable for the actual work needs of the production line. Therefore, relevant scientific research departments and researchers should strengthen the further research and analysis of the application of electronic automatic control system.

4. Future Development Trend and Prospect of Electronic Automatic Control System

4.1 More and More Open

The premise of open management of electronic automation control system is to fully master the core technology of its electronic automation equipment, and realize the management and control of system transmission, information management and automatic dispatching on its basis. The system network is connected by interfaces and ports to realize the connection between power automation equipment and the outside world. Simulation technology and home computing technology can be fully used to reflect the openness of power equipment design, and widely apply it to network communication technology to realize the intelligent management of data information analysis.

4.2 More Innovative System

Owing to the continuous development of social economy, electronic automatic control system will develop from single mechanical equipment to diversification, integration and systematization. Industrial enterprises should continue to pay attention to the improvement of the innovation ability of their own electronic automatic control system, enhance the R & D and investment in the electronic automation engineering control system with independent intellectual property rights, and provide a broader space for the further development of electronic automatic control system in the future. In addition, enterprises should also change the previous situation of independent innovation, break the previous traditional economic growth mode, strengthen the improvement of their own independent innovation ability, strengthen the content of science and technology, promote economic transformation and development, and meet the current socio-economic production standard requirements as much as possible^[3].

4.3 Remote Control

Realizing the remote control of mechanical equipment and electronic automatic control system is the inevitable development trend of a large industry in the future. Affected by many factors, the system will fail at any time. If the relevant technical maintenance personnel do not find the existing fault problems in time, and do not formulate the corresponding emergency measures and solutions in advance, it will cause serious consequences to the enterprise and affect the product production quality, work progress and the economic benefits and development of the whole enterprise. Remote control can solve the above problems. It can realize real-time monitoring of the production process

of the whole enterprise, real-time monitoring for sudden equipment faults or system faults caused by environmental factors, timely find and deal with possible problems, play a good protective role, effectively improve work efficiency and reduce occurrence rate of system failure.

5. Conclusion

To sum up, owing to the continuous development of society and science and technology, China's electronic automation control system is also undergoing continuous innovation and improvement. From being limited to automobile manufacturing industry in the past, it has been widely used in various industries. In the future, it will develop towards diversification, integration and systematization to realize independent innovation development, remote management and control, laying a solid foundation and guarantee for the progress of China's industrialization.

References

- [1] Wu Bin. Development Direction of Electronic System Control Automation [J]. Electronic Technology and Software Engineering, no.06, pp.169, 2015.
- [2] Niu Yuan, Hu Lisheng. Discussion on Automatic Control Technology in Applied Electronic System [J]. Computer CD Software and Application, vol.17, no.21, pp.155-156, 2014.
- [3] Cai Zhaowen. Research on Automatic Control Technology in Applied Electronic System [J]. Scientific and Technological Innovation and Application, no.08, pp.58, 2014.