Research on Fire Alarm Computer Monitoring System in Fire Engineering

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Abstract. With the in-depth development and application of computer technology, the fire alarm computer monitoring system in fire protection engineering has become more and more essential equipment in modern life. With the support of network technology, the fire alarm monitoring system of fire protection engineering has formed a complete system, including alarm monitoring, automatic fire control, fire linkage control, and fire data monitoring and analysis modules. This article mainly analyzes the fire alarm computer monitoring system in fire engineering.

Keywords: Computer, Fire Engineering, Fire Alarm Monitoring System

1. Introduction

1.1. Background of fire alarm computer monitoring system in fire engineering

As the pace of urban construction in our country continues to accelerate, the new generation of information technology represented by mobile Internet has played an increasing indispensable part in the administration, public services of government departments, the management, business models of enterprises and the people. The life of the city has had a profound impact. In addition, the application of fire alarm computer monitoring system in fire protection engineering has also become an inevitable trend of urban fire protection construction.

The informatization of urban construction and management is gradually developing from digitization and networking to automation and intelligence. The construction of smart cities has become a general trend. "Smart fire protection" is a significant sub-module under the public safety sector, an important part of the smart public safety application field in the construction of smart cities, and the specific application of smart cities in the field of urban fire protection.

From the perspective of urban management, urban public safety is a key area of smart city construction, covering urban fire safety. The fire alarm computer monitoring system in fire protection engineering belongs to smart fire protection. It is a brand-new concept. It is still in the development
stage and there is no authoritative and unified definition and standard. This aspect of smart fire protection should cover all aspects of urban fire safety. By acquiring key information on fire safety, data analysis can provide decision support for urban fire safety management, key fire protection units, fire protection equipment manufacturers, insurance institutions and scientific research institutions. Realize the overall transformation and upgrade of the fire protection industry [1].

1.2. Advantages of fire alarm computer monitoring system in fire engineering

The fire alarm computer monitoring system in fire protection engineering is a kind of early warning monitoring system based on intelligent equipment, which judges the fire situation by detecting changes in the environment. The principle of the system refers to: using measuring devices to transmit the temperature, smoke and other related environmental parameters generated during the fire to microcomputer, and the single-chip microcomputer makes a judgment after analysing and comparing these data [3].

The measuring devices and single-chip microcomputer in the intelligent fire early warning and monitoring system own many advantages in judging the fire situation. The structural form is a structure that organically combines the main network and the secondary network, so it has strong adaptability and can effectively improve the reliability of the building's fire emergency function. At the same time, the fire alarm computer monitoring system in the fire protection engineering can faithfully reflect the small changes in the monitored environmental objects, and can automatically compensate for the factors that prevent fires in the environment, it also can automatically handle the adverse effects caused by electrical interference. The use of software code programming in the system significantly improves the linkage and repairability of the system regarding with fire protection. Furthermore, in order to prevent fires, a fire-fighting monitoring system should also be installed in the building to meet the requirements of the design of the fire-fighting intelligent control system.

The fire alarm computer monitoring system in fire protection engineering is a kind of early warning monitoring system based on intelligent equipment [4].

1.2.1. The first advantage. It effectively and comprehensively reflects the subtle changes of the monitored environmental objects, automatically compensates for factors such as environmental humidity and dust that effectively prevent fires, and automatically handles the effects of electrical interference and line distribution on fire-fighting equipment.

1.2.2. The second advantage. It adopts the structure that combines the main network and the secondary network, which has strong adaptability, and improves the reliability of the operation of the fire protection system in the fire protection application and function of the building.

1.2.3. The third advantage. Realize the full bus layout of bus alarm and total linkage control, thus effectively avoiding the long-distance wiring of the control system.

1.2.4. The fourth advantage. The improvement of software technology is fully realized, and the combination of hardware is replaced by software code programming, which improves the repairability and linkage of the fire protection system.
2. The structure of fire alarm computer monitoring system in fire engineering

2.1. Analysis of the fire alarm computer monitoring system in fire protection engineering

In the modern fire alarm monitoring system of fire protection engineering, the fire linkage soft control is one of the independent modules, and the two are both unified and independent of each other. It is mainly composed of five parts, namely fire hydrant control, water spray control, smoke prevention and exhaust control, emergency information dissemination and alarm control, as which is shown in figure 1.

![Fire linkage soft control](image)

**Figure 1.** Flow chart of the structure of fire linkage soft control

2.2. Functional requirements of fire alarm computer monitoring system in fire protection engineering

Build an actual combat command platform to provide assistant decision support for commanders at all levels, and enhance the scientific and intelligent level of firefighting and rescue. Make full use of big data, cloud computing, mobile Internet, geographic information and other technologies, relying on the public security network (fire information network, command and dispatch network), border access platform and public security map to achieve one map command and one map for firefighting and rescue scheduling, analysis with one picture, decision-making with one picture [9]. Disaster information is real-time. Through the two major emergency communication systems for urban major accidents and geological disaster accident rescue, real-time disaster scene images, voices and data are obtained to catch the dynamics and development trend of the disaster. The target of combat is precise, and the fire protection business is gradually integrated. Information system and other data, associating the geographic location, overview, structure, fire protection facilities and digital plans of combat targets as well as information on surrounding roads, water sources, and major hazards, provide three-dimensional support for the analysis and judgment of combat targets. Precise and optimized power information basic information collection and maintenance means, realizing the display of information on the fire brigade stations, various forms of fire brigades, equipment, equipment, and support materials in the jurisdiction, providing accurate information reference for scientific command and force dispatch; visualizing combat command, applying location positioning, and the Internet of things, mobile command terminal and other equipment, master the location, quantity and status of the power adjustment, realize mobile information push, one-click force dispatch and front and rear information interaction; through sharing and docking government emergency response agencies, social emergency response agencies, and joint service guarantees Units and other information resources to improve the effectiveness of alarm dispatch, joint handling, and linkage. On the basis of in-depth integration of information resources, it realizes "a picture" display and "big data" analysis of information elements of firefighting and rescue, provides auxiliary decision support for commanders at all levels, and continuously improves the scientific and intelligent level of firefighting and rescue [3].
3. Introduction and analysis of fire alarm computer monitoring system in fire protection engineering

The goal of fire protection engineering is to eliminate fires and prevent fires, but in ordinary work, the proportion of preventive work is relatively small [7]. The fire alarm analysis system is a system that focuses on fire prevention. It can use past fire data information. The simulation calculation can calculate the main fire occurrence in the city, and can simulate the fire prevention plan based on the cause of the fire.

Integrate local smart electricity, gas, and water system construction, integrate various monitoring systems and video resources of high-rise residential buildings, and establish an intelligent fire warning system. The urban monitoring system is applied to newly built high-rise residential buildings to conduct real-time monitoring of fire-fighting facilities and evacuation stairs. Install and apply independent fire detection alarms, simple sprinkler devices, fire emergency broadcasts, independent combustible gas detectors, wireless manual alarms, wireless sound and light alarms in old high-rise residential buildings. Build an intelligent fire-fighting early warning system for high-rise residential buildings to realize multi-party linkage of fire-fighting equipment and facilities, automatic alarm systems, and personnel management [5].

Table 1. The characteristics of the fire alarm control system module

| Fire alarm control system module       | Meaning function                                      |
|----------------------------------------|-------------------------------------------------------|
| Fire monitoring                        | Main functional modules, monitor data information of monitoring points |
| Garage transfer                        | Realize automated fire control                        |
| Fire monitoring management             | Add, modify, and delete data information of fire monitoring points. |

3.1. Related analysis of fire alarm monitoring

The characteristics and main function of fire alarm control system module are described in table 1[8]. In the fire alarm control system, this module is one of the main functional modules. The main function is to monitor the data and information of the monitoring point. If there is fire information, the relevant data will be analysed immediately. Then an alarm signal is issued, and the design of this module is mainly carried out according to the following ideas [2]. First, the fire monitoring point is connected to the fire alarm control system through the network protocol. Once a fire alarm occurs, the fire alarm point will promptly transmit the fire information to the fire control system. Secondly, after the fire control system receives the fire data information, it will automatically analyse it. Data information mainly refers to. Finally, due to the fire control system is directly connected to the database, the fire location number can be used to accurately query the information of the fire location, and then display an alarm.

3.2. Relevant analysis of garage transfer

As described in table 1, which refers to the characteristics and main function of fire monitoring module, garage transfer is a key function point for automatic fire control [8]. Once a fire alarm occurs, the control
system will analyse the garage information and automatically assign firefighters to the fire point to fight the fire. The design of this function point is mainly based on the following ideas. First, use the data information sent by the fire monitoring point to detect the geographic data information of the fire.

Secondly, the shortest path calculation is performed on the data information of the monitoring network and the online shop of the fire garage, and the firefighting unit is determined and sent to fight the fire. Choosing the optimal path calculation method greatly improves the efficiency of firefighting and disaster relief.

3.3. Related analysis of fire monitoring management

As illustrated in table 1, the fire monitoring management module is mainly to add, modify or delete the data information of fire monitoring points [8]. Its working principle is as follows: system users enter the system after authorization authentication, and then enter the fire monitoring management interface to start execution Operation of adding and deleting data information. The data information involved mainly includes: the specific geographic location of the monitoring point, the number of the monitoring equipment installed at the monitoring point, and the maintenance period of the monitoring point [9].

4. Conclusion

With the development of modern science and technology, the function of the fire alarm monitoring system is expanding, and it is no longer a single monitoring alarm function as it in the past. Modern fire alarm monitoring is an organic fire monitoring system that uses network resources to integrate monitoring, linkage, alarm, regulation, and prevention analysis. The research and application of the organic whole of the fire monitoring system is not only so much the progress of scientific application technology, but also the completeness of the current fire protection knowledge system in our country [10].

In summary, the fire alarm computer monitoring system in fire protection engineering is a new type of network alarm control system. Through it, the prevention and monitoring of fire can be effectively realized, thereby minimizing the loss caused by fire. In addition, with the increasing scale of urban construction, the awareness of fire safety is also increasing day by day, and the automatic fire alarm monitoring network technology still needs further research and development.

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