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Design and Implementation of GPRS-based Electrical Monitoring System

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Abstract: GPRS is used in electrical monitoring so that it can improve the rationality of the design of electrical monitoring, and also improve the accuracy and science of electrical equipment monitoring. GPRS technology plays the role of data transmission in the whole electrical equipment monitoring, and GPS technology is used to build the monitoring system framework and continuously carry out safety tests so as to ensure the safety and stability of GPRS-based electrical monitoring system. GPRS, as a data transmission terminal for electrical equipment, has a stable function and can well fulfill the requirements of electrical monitoring and improve the level and quality of electrical monitoring.

Keywords: GPRS; Electrical Monitoring; System Design; Implementation; Countermeasures

Introduction

Electrical devices are electric power transmission devices, which do not have the function of data transmission, so in the process of building electrical equipment monitoring system, usually it is done with the help of GPRS technology. The use of GPRS technology can greatly improve the stability of the electrical monitoring system and also improve the quality of electrical monitoring work carried out. GPRS technology electrical monitoring system incorporates automatic control technology, geographic information systems, computer network technology, remote control technology and unlimited telemetry. The use of GPRS technology to supervise electrical equipment allows the timely and accurate transmission of operational data, geographic distribution data, usage time data and performance status data of electrical equipment, allowing people to efficiently obtain data on the operation of electrical equipment. With the help of Internet technology, people can also monitor electrical equipment remotely and understand the data information of the operation of electrical equipment. Through the processing and analysis of electrical equipment monitoring information, so that you can well determine the working state of electrical equipment, timely detection of problems in the operation of electrical equipment, and timely adoption of appropriate measures to solve the problem.

1. Overview of the concept of GPRS communication technology

GPRS technology as a new network technology, it is built on the basis of GSM land communication network, can also provide packet data services for GSM land communication network technology. GPRS technology has unique advantages compared to other technologies, such as: very strong stability; stable technology use; low price; strong signal and wide coverage. GPRS technology is ideal for use in situations where equipment is widely distributed and the area involved is large, and GPRS technology can be used to monitor electrical equipment to achieve the purpose of monitoring. GPRS technology uses packet switching technology, but does not require a dial-up connection using a Modem. GPRS technology only takes up resources when users receive and send data, so that monitoring is always online. GPRS technology is also very fast in the use of the process of login, and can also achieve high speed transmission.

2. The specific composition of the GPRS-based electrical monitoring system

2.1 The hardware structure of the GPRS-based electrical monitoring system

GPRS-based electrical monitoring system hardware structure mainly includes an upper computer and a number of lower computer, and it use GPRS technology to complete the communication work, the upper and lower computer together to form a two-level distributed computer control system. The upper computer is in the center of management in the whole computer control system, and the functions of the upper computer are mainly: telecommunication, data retrieval, remote control, system maintenance, telemetry, and even electronic map display and report printing. However, the lower computer is mainly installed at the site of the power equipment to complete the work, its main functions are: to help the online control machine to achieve remote communication, to help achieve the control of the power equipment switch, but also to monitor the voltage and current of the power equipment. GPRS electrical monitoring system hardware construction process to focus on the selection of temperature sensors, must be based on the actual situation to choose the most appropriate temperature sensor. The types of temperature sensors are diverse, including: analog integrated temperature sensors, intelligent integrated temperature sensors and the most traditional discrete temperature sensors. Nowadays, with the development and use of Internet information technology, all aspects of social production and life practices are developing in the direction of networking and intelligence. In the process of selecting temperature sensors to fully consider the economy and special characteristics of the entire electrical monitoring system, and even consider the installation of the problem. Signal conditioning circuit is also the electrical monitoring system needs to be considered, mainly to deal with signal amplification, conversion, filtering-related issues, the signal will be transformed into a single-chip computer that will be able to handle the form.

2.2 Construction of GPRS-based electrical wireless monitoring system

Based on GPRS technology electrical wireless monitoring system construction mainly includes the following aspects: first, GPRS digital transmission terminal; second, monitoring terminal; third, transmission network, specifically the public data network and GPRS network; fourth, monitoring center. In order to improve the security of data, the monitoring center and the monitoring terminal must have data management module, and in the more critical monitoring terminal also need to set up temporary storage, so that in case of network interruption or monitoring center failure and other unexpected problems, to avoid the loss of relevant data. The monitoring terminal is generally composed of the collection and control module, however, the collection and control module involves control equipment, lighting control program, data acquisition equipment and remote communication program and so on. The GPRS data transmission terminal is a GPRS-based network terminal device, and its core is microcontroller technology and GPRS technology, and its internal embedded TCP/IP protocol. The monitoring center of the electrical monitoring system is a local area network (LAN), which is mainly composed of proxy servers, firewalls, query desks, etc., and corresponding monitoring software and query software or database management programs.

3. The GPRS-based electrical monitoring system design and implementation of countermeasures

3.1 To improve the quality of GPRS electrical monitoring system design and use of personnel

In the process of electrical equipment monitoring system design, we must ensure that the designers understand both electrical equipment and GPRS technology, to be able to scientifically and reasonably combine electrical equipment with GPRS technology, to make good use of the advantages of GPRS technology, the use of GPRS technology to improve the scientific and rational electrical equipment monitoring system. At the same time it is necessary to improve the quality of the personnel using GPRS electrical monitoring system, standardize the behavior of GPRS electrical monitoring system users, according to the use of electrical equipment, the design of the geographical scope, give full play to the role of GPRS technology, monitoring electrical equipment, but also electrical equipment monitoring information to the user in a timely manner, so that users can keep abreast of the operation of electrical equipment, the discovery of electrical equipment problems, and timely measures to solve the problems of electrical equipment.

3.2 To ensure the quality of the equipment required for GPRS electrical monitoring system

GPRS-based electrical monitoring system design and use of the process must fully consider the quality of the equipment required, must be in strict accordance with the requirements of the use of GPRS technology and use equipment that has excellent performance, so as to ensure the normal and reasonable operation of the entire electrical monitoring system.

4. Conclusion

Electrical equipment in the use of the process must be monitored systematically, and must make full use of good GPRS technology scientific and reasonable design of electrical equipment monitoring system, to improve the quality of electrical equipment monitoring system, so as to achieve a full range of electrical equipment, full coverage monitoring, so that we can accurately grasp the operation of electrical equipment in a timely manner.

References:

[1]Zhang Bonar, Wu Guichu, Chen Chong, Ge Shiwei, Wan Yaomu. Design of Electrical Fire Monitoring System Based on MQTT Protocol [J]. Modern Building Electricity,2019,10(03):39-44.

[2]Kuang Honghai, Zhang Shuyun, Zeng Liqiong, Li Shengqing, Zhou Zhiwei. Design of Remote Monitoring System for Rural Smart Distribution Grid Based on GPRS and GPS[J]. New Technology of Electrical Energy for Electricity,2017,36(04):83-88.

[3]Xu Xinkai, Meng Xiangyin, Hao Mengjie, Sun Yangzhi, Tang Lei. Design of GPRS-based Remote Monitoring System for Natural Gas Pressure Regulating Station[J]. Electronic Technology Applications,2015,41(10):13-16.

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