The Design of Intelligent Monitoring and Control System of the Mechanical Equipment based on “Internet Plus”

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Abstract

Each heavy machinery equipment for the end of the system, each end of the installation of a GSM data collector, complete the collection of the operating parameters of the equipment, the establishment of basic conditions for the exchange of things. According to the data server address the preset timing, collector through the GPRS network or Internet wireless network data transmission, data transmission acquisition collection to the cloud, the cloud to complete the function of data identification, error correction, classification, management and analysis of the data management system based on the transmitted data, so as to realize the management of large data.

Keywords: Internet plus; heavy equipment; data management

1 Introduction

In many modern large-scale industrial operation of heavy machinery and equipment, in order to high-quality stable operation, long time, safety, full load, equipment manufacturers will often install some sensors in the product, inform the customer equipment status convenient, so as to reduce the losses caused by equipment failure. But in the equipment downtime, reason cannot be diagnosed by the operation of equipment has many faults, the fault diagnosis of equipment downtime will increase the fault detection, fault diagnosis and determine the difficulty or to predict the fault according to the operation state of the equipment which are difficult to fundamentally eliminate the fault diagnosis. Therefore for large equipment supervision cannot meet in fault analysis and processing, but should be more emphasis on real-time collection, analysis and treatment for their condition information during the equipment operation, as soon as possible to identify early fault, fault monitoring and development trend, so before was severely damaged in the mechanical equipment, timely the implementation of remedial measures or to shut down, will damage and loss to a minimum, so as to improve the productivity.

2 System introduction

Most heavy equipment operating environment is relatively remote location in the relatively remote areas, the use of relatively poor environment, long working hours. Therefore, the project must have the following characteristics:

1) Covering a wide range: the system network with the GSM wireless communication network, the mobile phone signal coverage, as long as there is a signal where you can

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real-time transmission of data, the expansion of unlimited, unlimited access location, can meet a number of cross regional multiple mobile monitoring points (such as vehicle access requirements).

2) Real-time data transmission is high: with the GPRS public mobile communication network technology matures and the continuous improvement of transmission rate, with wireless access to Internet GPRS network, can fully meet the real-time transmission of large quantities of data.

3) System has the advantages of simple installation, project construction, joint debugging system after starting the work collection equipment and the center can realize the interconnection, greatly reduce the construction period of the project, efficient network.

4) High reliability: the GSM data acquisition equipment are industrial grade design, all kinds of data processing technology to take preventive measures and correction scheme and security communication means, to protect the equipment 7 x 24 hours of uninterrupted operation, never crashes.

5) Simple maintenance and low operating costs: the monitoring point and the center is completely wireless communication, low maintenance cost, communication cost only GPRS traffic monitoring point data according to the charge, can also monthly charge, low cost. At the same time, the system in the data upload, take a series of measures to save traffic, such as only when the data has changed only when the transmission and so on, so that the flow rate to the lowest.

This system is Internet plus heavy machinery and equipment, through the monitoring of heavy machinery and equipment operating parameters, and the use of the Internet to achieve long-distance data transmission, realize the management and analysis of large data through cloud computing, intelligent detection, intelligent equipment management, the focus is to achieve prediction of equipment failure alarm, analysis complete function, advanced manufacturing process of heavy machinery and equipment, finally realizes the monitoring and management of heavy machinery and equipment of the whole life cycle. The system of wireless remote communication technology, Internet technology, cloud computing, detection technology is combined to establish reliable and efficient service of the Internet of things, through the interconnection to realize intelligent monitoring and management of big data technology in the field of Internet plus advanced manufacturing. Each heavy machinery equipment for the end of the system, each end of the installation of a GSM data collector, complete the collection of operating parameters of the equipment, the establishment of basic conditions for the exchange of things. According to the data server address the preset timing, collector through the GPRS network or Internet wireless network data transmission, data transmission acquisition collection to the cloud, the cloud to complete the function of data identification, error correction, classification, management and analysis of the data management system based on the transmitted data, so as to realize the management of large data.

3 System design

Each of the equipment for the end of the Internet of things, each end to install a GSM data
collector, the operating parameters of the equipment acquisition, according to the data server address preset, collector through the GPRS network or Internet wireless data transmission to the specified the server (Yun Duan), the server completes data identification and correction, classification, management and analysis of the data management system based on the transmitted data, so as to realize the management of large data Yun Duan.

GSM data acquisition card and mobile phone including SIM sensor signal acquisition part two part of the hardware circuit, can realize the SMS notification, GPRS data transmission, data collection and other functions, to complete the Internet of things based data gathering and transmission of data, including tire pressure monitoring, tonnage monitoring and so on.

The server data management system is shown in Figure 3, according to Internet the data transmitted from the implementation of classification management, such as tire pressure management system, management system and management tonnage respectively for data analysis, report to the graphic or tabular form, for the user to have access. It also be based on the needs of users to develop personalized management services, such as the development of mobile client (App), special data push, etc.

4 Conclusions

The system of wireless remote communication technology, Internet technology, cloud computing, detection technology is combined to establish reliable and efficient service of the Internet of things, through the interconnection to realize intelligent monitoring, analysis and management of big data technology in the field of Internet plus advanced manufacturing. A scientific solution is put forward to solve the problem of data transmission in remote areas and the prediction and analysis of the system fault.

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References