Analysis of the Application of Electronic Technology in Engineering Area

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Abstract. As a relatively new production technology in engineering technology, electronic technology can optimize and improve the complicated and tedious production process in the past, and then achieve the goal of reducing manpower and material resources and improving productivity. For this reason, this paper will discuss the application and analysis of wireless remote monitoring system and automobile machinery production, and elaborate the design and analysis of the system in the application analysis of wireless remote monitoring field, and enumerate the relevant theoretical basis. But the automobile production machinery aspect mainly focuses on the remote control system design, through the actual content carries on the research to the electronic technology application in the engineering domain.

Keywords: wireless remote monitoring system; Electronic technology; Engineering; application

1. Application analysis of wireless remote monitoring system
As a member of the information exchange channel, communication technology is often applied to satellite, mobile and other communication technologies in the modernization project. As an important branch of electronic technology, communication technology not only increases the diversification of information exchange, but also makes communication more stable and convenient in different fields. Moreover, with the continuous expansion of the scope of engineering field, the addition of communication technology can improve the smooth communication of the whole system and ensure the smooth communication of different personnel in the later application. With the development of time, communication technology has evolved into wireless remote monitoring system. Wireless remote monitoring is based on sensor node acquisition, using communication technology to transmit signals to the computer, through the enterprise LAN transmission to the service terminal.

1.1. design and analysis of wireless remote monitoring system
This research system is designed to monitor and collect vibration frequency of industrial equipment based on wireless sensor network. The total system is designed in three steps: 1. Collect wireless data system for sensor terminal nodes; 2. See the design of wireless remote monitoring system in detail in figure 1 below.
The acceleration sensor data acquisition system with the monitoring sensors, access to work through the various nodes, the system can actual application in the field of electronic process, for different engineering production operation process can be simplified to a certain extent, can be more complex production process in the traditional engineering as well as tedious operation process, timely and effective optimization, and products in the process of engineering construction inspection and selection of targeted, in the node work, spread to areas in minutes intervals upload the waveform data. By effectively combining the advantages and characteristics of electronic technology, more hidden resources in engineering construction can be released in time.

1.2. theoretical basis
At present, the wireless remote monitoring system is designed based on the theory of wireless communication technology. The wireless communication technology is developing in the industrial field, mainly through rf chip technology, strong energy battery and low power loss digital circuit. Due to the communication of distance determines the infinite monitoring system using the method, to consider the electromagnetic wave propagation in wireless communication system in the process of consumption, in order to meet the requirements of the wireless monitoring system to consider the electromagnetic wave, the transmission way of energy consumption as a path of consumption, which in the path of consumption
refers to the space linear quadratic inverse proportion consumption, transmission distance and write for free space consumption.

The formula is as follows:

\[
\frac{P_l}{P_r} = \frac{(4\pi d)^2}{\lambda^2} = \frac{(4\pi f d)^2}{c^2}
\]  

(1)

Where the loss is inversely proportional to the distance squared, when the decibel form can be expressed as:

\[
L = 20\lg f + 20\lg d + 32.45
\]  

(2)

Among them, the following relations can be obtained by transmitting frequency, receiving frequency, light speed, carrier wavelength and distance:

\[
P_r = c^2 p_t / (4\pi f d)^2
\]  

(3)

1.3. ZigBee technology and wireless communication technology protocol

In the field of industrial wireless monitoring, ZigBee technology is adopted to carry out the protocol with wireless communication technology. Its ZigBee technology is characterized by low cost, efficient communication and large capacity. In order to make a clear comparison, the comparison of short-range wireless communication protocols is summarized.

**Figure 2.** Comparison of short-range wireless communication protocols

|                  | IRDA   | BLUETOOTH | RFID   | WI-FI   | ZIGBEE     |
|------------------|--------|-----------|--------|---------|------------|
| Transmission     | 1m     | 10m       | 10m    | 100m    | More than 100 m |
| distance         |        |           |        |         |            |
| maximum power    | mm     | 100MW     | Without the | 100 MW | 1MW        |
| consumption      |        |           | power supply |       |            |
| Transmission     | 16     | 1         | 10.212 | 11      | 0.25       |
| rate (Mb/s)      |        |           |        |         |            |
| Network node     | 2      | 7         | 2      | 255     | 65535      |
| Working          | 980mm  | 2.4GHz    | 5.8GHz | 2.4GHz  | 2.4GHz     |
| frequency band   |        |           |        |         |            |
| Application field| Point-to-point data transfer | Move towards a personal network | Logistics management | WLAN(Wireless Local Area Network) | Wireless sensor network |

According to the above chart, it can be concluded that ZigBee technology can analyze data through a certain sampling frequency in wireless remote monitoring. In the protocol with wireless communication technology, the starting layer takes IEEE802.15.4 protocol as the physical layer, interfaces Mac layer with physical layer, opens and closes the wireless transceiver node, and mainly receives data. The second layer ACTS as the data connection layer, and the third layer ACTS as the security layer for prevention and control. Its protocol is shown in figure 3 below.
2. Remote control system in automobile production machinery

With the continuous development of the economic market, people's living standards have also been improved, and the basic necessities of the general public have also begun to change. As an increasingly popular means of transport for every ordinary Chinese family, cars have become an indispensable part of public life along with electronic intelligent products in the process of increasing public demand. And people's requirements for cars are not limited to simple and single function. The advent of electronic technology has neatly solved this problem. Simply put, the introduction of electronic information technology in the field of automobile production can improve the appearance and interior decoration of automobiles in the production process to be more beautiful and fashionable. Moreover, the application of digitization and information technology in electronic information technology can also add convenient functions such as navigation, anti-theft, and even one-button alarm in the automobile, further accelerating the development process of automobile information and technology. On the other hand, due to the traditional automobile production mode is relatively backward, in the automatic production and design there are still some limitations and shortcomings, therefore, through the effective application of electronic technology, can be continuously for auto production way and experience summary, then under the leading of science and technology, promote more efficient in the field of automobile production, at present, remote control system can in car production is reflected the deeper development of electronic technology.

2.1. Remote control system design

In the field of automobile production machinery, the remote control system of general construction machinery is adopted, which is mainly composed of three parts: remote control terminal, wireless communication network and vehicle-mounted terminal. For details, see figure 4 below, remote control system.

![Figure 3 ZigBee protocol framework](image-url)
Its remote control terminal is responsible for operating the control command, the command signal transmission for wireless communication network. From this to the car terminal. This process can be operated remotely, reflecting the outstanding contribution of electronic technology in the engineering field.

See figure 5 above, In this system, in order to normal use of the function of remote control terminal, its main thread need to car terminal control instruction, when a control instruction and connect to normal after can create two threads, create the child thread can realize through the new to the work site, according to accept and video information to accept the child thread can also realize the collection of vehicle terminal equipment working condition and feedback.
Conclusion
Through the discussion of this paper, it can be found that electronic technology plays an important role in the field of engineering construction, this paper also selected the most popular wireless remote monitoring and automobile machinery production two aspects to discuss, hoping to strengthen the role of electronic technology in the field of engineering in the future in this way. All the flow charts used in this paper are also summarized in the actual work, which is expected to provide some reference value for future work.

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