Design and Implementation of Monitoring System Voice Prompt Alarm Part

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Abstract: With the progress of science and technology, the design of monitoring system is becoming more and more humanized and intelligent, which has become a new development direction of modern monitoring system. As the terminal of monitoring system, voice prompt and alarm part play an important role. This paper is about how to achieve voice prompt alarm. This paper analyzes the superiority of the voice warning alarm mode, and puts forward a design scheme based on MCU AT89S51, GSM module TC35i and voice chip ISD2560 to realize remote monitoring and warning part of voice warning.

1. Introduction

With the rapid development of science and technology in today's society, people are feeling the great convenience and great benefits of high technology, but at the same time there are many unsafe factors, for example, the crimes of theft, robbery and espionage are increasing with high technology, and all kinds of accidents also occur. Students. How can we make people's safety precautions keep up with the development of science and technology and effectively prevent the violation of these crimes? It is not enough to rely solely on the ordinary door lock, anti-theft door or monitoring, alarm and other systems. Thus, access control and intrusion alarm system, remote monitoring, Home Furnishing voice alarm system came into being in time and again. Because of this, advanced technology such as computer technology, microelectronics technology and precision integration technology has been stretched in this field. Great material, financial and human resources are put into this field, and all kinds of systems are born almost every day, and the pursuit of people is often the most ideal, most practical, and most humanized. Therefore, the study of such a system is of great practical significance and social value.

2. Voice Warning

The remote alarm system based on SMS is a two level network structure: background monitoring center and well site monitoring terminal. Among them, the background monitoring center is the upper part of the whole system, which is mainly composed of industrial control computer, GSM communication module, corresponding background management software and database. Through the two-way communication between the GSM communication module and the wellsite monitoring terminal, it can collect, analyze and process the data of the system setting, the police situation and other data in real time so as to realize remote monitoring. The well field monitoring terminal is composed of single chip microcomputer, which is a part of the system's lower computer. Through various anti-theft sensors, it collects the field information and sends it into the main control unit, which is identified by the microprocessor. If it is believed to have abnormal information, the GSM communication module is started, and the alarm letter is sent to the background and the relevant guard personnel in time. Interest.

The system uses a new generation of wireless communication GSM module TC35i, which can quickly and reliably realize data, voice transmission, short message service SMS (Short Message Service) and fax. The TC35i module is mainly composed of six parts: GSM baseband processor, GSM RF module, power supply module (ASIC), flash memory, ZIF connector and antenna

interface. P-P data communication rate is 2400, 4800, 9600, 14400bps. The system has the features of real-time automatic data processing, fast speed, strong anti-interference ability, good compatibility and so on. And with the support of the software, it realizes a point to multi point real-time communication.

3. System Design

Sensors, like human facial features, are important tools for obtaining information. It plays a huge role in industrial production, national defense and science and technology. But compared with the rapid development of computers, sensors as "five senses" are far behind the development speed of computers as "brain". With the automation and intelligent development of the measurement and control system, the sensor has high accuracy, high reliability and good stability, and has a certain capacity of data processing, and can be self checking, self correcting and self compensating.

The design of a temperature controller based on AT89S51 microcontroller is introduced. In this design, a high precision temperature sensor AD590 is used to measure the temperature of the place where the monitoring is needed. The temperature voltage signal is amplified by the ultra low temperature drifting high precision operational amplifier OP07 and then sent into the 12 bit AD574A for A\D conversion. So as to realize automatic detection, real-time display and over limit alarm. The PID algorithm is used in the control part.

According to the slow temperature change and the control accuracy is not easy to grasp, I designed an automatic temperature control system based on AT89S51 microcontroller. AT89S51 is an improved version of AT89C51, adding a lot of new functions, the performance has been greatly improved, the price is basically the same, even lower than 89C51, the maximum working frequency is 33MHz, and the 89C51 limit working frequency is 24M, that is, S51 has a higher working frequency and thus has a faster computing speed. In addition, 89S51 has duplex UART serial channel, and integrates watchdog timer internally. It no longer needs external watchdog timer unit like 89C51. It also has a dual data indicator, power shutdown identification, a new encryption algorithm, which makes the decryption of the 89S51 impossible, and the security of the program is greatly enhanced.

4. Hardware System Design

The hardware circuit consists of two main parts: the analog part and the digital part: from the functional modules: the host circuit, the data acquisition circuit, the keyboard and display circuit, the control executive circuit.

4.1 The design of the host circuit

The main machine is realized by using the 51 series AT89S51 of ATMEL company, which is flexible and free to use software to perfect various control algorithms and logic control. The AT89S51 chip used in this system can reach 12MHz, and the operation speed is fast, and the control function is perfect. Its internal has 128 bytes RAM, and the internal flash ROM containing 4KB doesn't need external expansion memory, which makes the whole structure of the system simpler and more practical.

4.2 The design of the hardware circuit of the I / 0 channel

In this system, it needs to collect the temperature data in real time, then convert it into digital signal through A / D, send it into the specific unit in the single chip computer, and then send it to display; the other is compared with the set value, and the warning temperature is sent out by the voice alarm system.

4.3 Design of data acquisition circuit

The data acquisition circuit is mainly composed of AD590, 0P07,74LS373, AD574A and so on. The data acquisition of the system is mainly the detection and conversion of the current temperature

in the field. The temperature detection is completed by the platinum resistor. The differential value is obtained by the bridge. After the differential amplifier is amplified, it is sent into the A/D converter for conversion. Finally, it is sent to the processor. As the control precision is 0.1 degrees, and the accuracy of the temperature sensor and the AD converter should be higher in order to ensure the precision of the control. The precision can be roughly fixed to 0.1 degrees. Therefore, the temperature sensor needs to be able to distinguish 0.1 degrees; for the AD converter, AD needs to distinguish (90-40) /0.1=500 digits because the measurement range is 40-90 degrees and 0.1 degrees as the response of the AD division. Obviously, more than 10 AD converters are required. To this end, a high precision 12 bit AD574A is selected

AD574A is a single chip high speed 12 bit successive comparison type A/D converter introduced by the American analog digital company (Analog) with a hybrid integrated conversion chip built with bipolar circuits. It has the features of small external components, low power consumption and high precision, and has automatic zero and automatic polarity conversion functions, only a small amount of resistance components are needed. A complete A/D converter can be formed.

In order to meet the requirements of high precision measurement, the use of temperature sensor AD590, AD590 has high accuracy and repeatability (repeatability is better than 0.1 degrees C, its good non linear shape can guarantee superior to 0.1 degree of measurement accuracy, using its repeatability better characteristics, by non linear compensation, can reach 0.1 degrees C measurement precision.) ultra low temperature drift high precision transportation. The amplifier 0P07 amplifies the temperature and voltage signals to facilitate conversion of A / D, so as to improve the reliability of the temperature acquisition circuit. The interface circuit of the single chip computer and AD574A is shown in Figure 1.
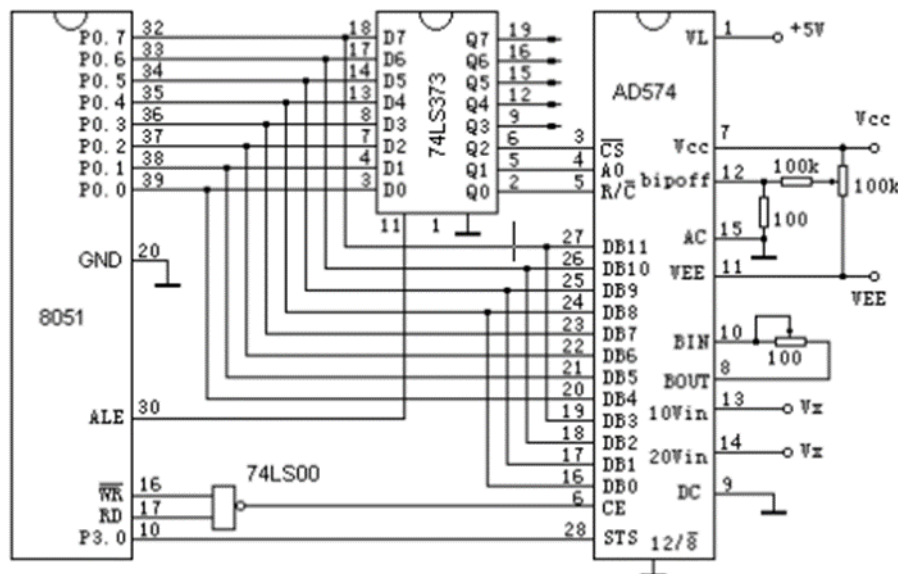

Figure 1 Interface circuit between single chip microcomputer and AD574A

5. Voice Alarm System Design

The 2500 chips produced by American ISD company are divided into four varieties, ISD2560, 2575, 2590 and 25120 according to the time of 60 seconds, 75 seconds, 90 seconds and 120 seconds. The actual application effect of ISD2560 voice chip [4] in voice recording and playing system is very good, and the outstanding feature of SD2560 is that the effect is very good and can be not simple. Compared with some other digital audio chips, I often reproduces voice, music, sound and harmony effect in real and natural. You can design your own circuit to realize the recording operation, which is very convenient to use. The core part of the project is the design of voice alarm system. This design mainly chooses ISD2560 voice chip for speech recording and playback. The recording and playback program mainly controls the ISD2560 through the SPI bus after receiving instructions. It is important to note that before the system is enabled, the alarm voice should be

recorded in advance. In order to play the voice information flexibly, the alarm voice is stored in the ISD2560, and each voice is played at the address when playing, and the corresponding delay should be made according to the length of each recording.

6. Summary

On the basis of selecting the ideal module, the design of the hardware circuit is successfully completed on the basis of the ideal module, which has achieved the expected goal, mainly in the following two aspects:

(1) The hardware circuit connection is reasonably planned, and to some extent, the circuit is simplified.

(2) The communication between each module is more fluent.

In the process of design, there are also many difficulties, in the guidance of the tutor and the help of the same group of students, through their own thinking, repeated modification, the system step by step closer to perfection, these results make me more confident to do the following work. Of course, there are still some shortcomings in the part of the hardware system, which will be further solved in the back of the general debugging. At least now, the problem is found. It is believed that if we think carefully, we will solve these problems, and the more arduous task is waiting for me to go all the way.

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