

Based on the Stm32 GSM intelligent home control system design

Chen Haonan¹, Zhang Juan², Gong Yun³, Luo Dengyu⁴

¹(Master Of Department Of Electrical Engineering, Shanghai University Of Engineering Science, China)

²(Associate Professor Of Department Of Electrical Engineering,
Shanghai University Of Engineering Science, China)

³(Master Of Department Of Clothing Design, Shanghai University Of Engineering Science, China)

⁴(Master Of Department Of Clothing Design, Shanghai University Of Engineering Science, China)

Abstract: This paper designed a control system which took the STM32 microcontroller as core. A remote control system of the smart home is elaborated, it constitutes by the GSM module, STM32 control unit and the wireless transceiver module. In the system, the data communication between GSM module and STM32 is realized by TC35, and the wireless communication between the master control unit and the slave control unit is implemented by the Bluetooth module with BC417143. This wireless gateway receives control command from the control software of home appliance which installed in the tablet computer through the Wi-Fi module, after the data processing and protocol conversion, then send the control signal to the home appliance network united by RF(slave) module through the RF(host) module.

Keyword: smart home; STM32 microcontroller; wireless communication

I. INTRODUCTION

Along with the development of computer technology, communication technology and network technology, and people material life level unceasing enhancement, people's work, life and communication, the relationship between information is increasingly close, people more and more attention to the safety of the household life, healthy, fast and comfortable[1]. Due to the daily household appliances products is increasing, how to effectively combine them as an organic whole, solve the inconvenience of decentralized control, provide people with better household life of all kinds of information, they are unified management and monitoring, is people have been pursuing, and household life of the future development direction. In this paper, based on this, puts forward a kind of based on STM32 embedded intelligent household wireless gateway, it can be through the RF module, everyday appliances to form a wireless network, makes the intelligent household in the home appliance has greater flexibility and mobility[2]. Wireless gateway via Wi-Fi module communicate with tablet, so control flexible, uninhibited. By tablet Android home appliance control software under the control of vivid boundary and the corresponding appliance control, organization and management and condition monitoring, more make household life becomes simple, fast and fun.

II. SYSTEM DESIGN

The system mainly realizes the remote control and remote alarm functions. Remote control: the user through the phone to control signal in the form of text messages sent via the GSM network to the GSM module, GSM module in the form of the AT command will text messages sent to the main MCU, the MCU receives the command analysis processing, through the wireless transceiver module from send it to the MCU, and further control the corresponding lighting or open and shut off the electrical equipment[3], so as to realize the remote intelligent control of household appliances. Remote alarm: from the MCU through the detection module to detect the smoke in the home regularly, temperature indicators, such as, if the home gas

leak, fire or theft danger cause indexes such as abnormal, the system will immediately cut off the power supply, start the alarm, and alarm to designated mobile phone to send text messages, to realize the remote monitoring of household.

III. THE HARDWARE CIRCUIT DESIGN

Detection module including the smoke alarm, CO sensor and infrared sensor. Use SS168 smoke alarm, can effectively detect the happening of the smoldering fire, with independent wireless alarm;;CO sensor using CO/CF - 1000, used for gas leakage alarm, when the concentration of carbon monoxide gas environment in worshipping value to set, can send out sound and light alarm signal[4]. Infrared sensor Choose active infrared detector ABE - 200, the composed of infrared transmitter and infrared receiver and alarm controller. There is a beam between the infrared transmitter and receiver, someone, will all or part of the block infrared beam, the receiver output electrical signal strength can produce change, so to start the alarm controller send out alarm signal.

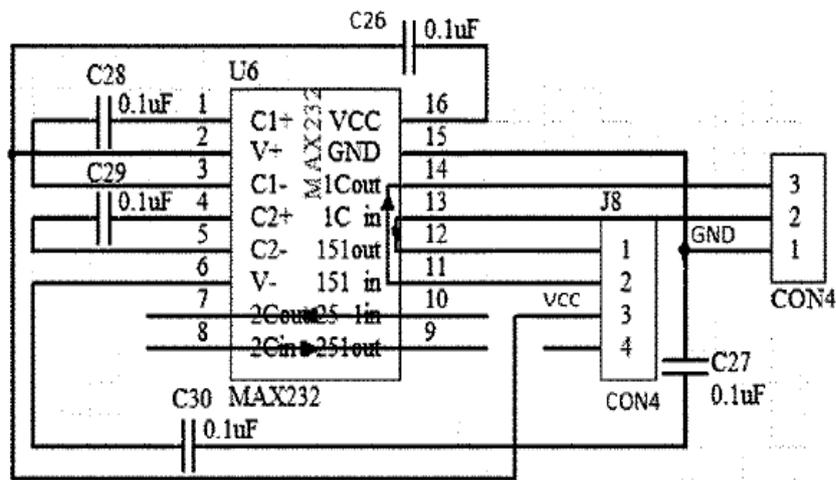


Figure 1.The GSM module interface circuit diagram

IV. SYSTEM SOFTWARE DESIGN

The SMS message usually has two modes: TEXT mode and PDU mode.PDU mode and TEXT mode also use AT commands to realize the function of sending short message, though the TEXT pattern with the advantages of simple operation, but can't send and receive Chinese characters; The PDU mode, can send letters, symbols, characters, such as a variety of character set, at the same time PDU mode can be directly to the user to manipulate data unit, is the vast majority of mobile phone the default mode. In order to guarantee system of wide applicability, this paper adopts the PDU mode to send and receive short message [5].PDU mode, from the structure can be divided into two parts of information head and body, the information included in the first text center number, the types of information, called the information such as address and character set to choose.PDU mode supports different coding format, can easily complete the data acquisition work: 7 bit. 8 bit and UCS2 code.7 bit code for sending ASCII characters; 8 bit code for sending data message; While UCS2 code for sending Unicode characters.

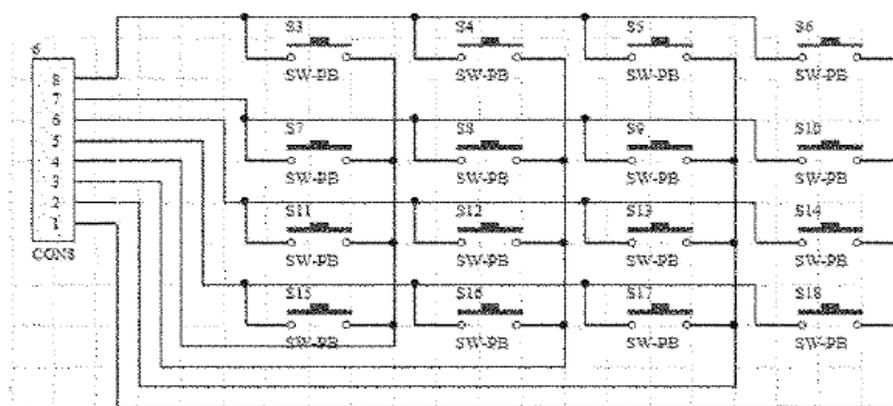


Figure 2. Matrix keyboard module circuit

V. SUMMARY

SMS, as a kind of value-added service of GSM, with the expansion of the GSM network coverage, obtained the rapid development, it has the transmission speed, low cost, do not take up the advantages of voice communication channels, thus the remote intelligent control has been widely used in the system. Smart home system introduced in this paper, with the STM32 as the core, through the GSM network, mobile phone short message function of the household environment of intelligent control and remote alarm, the system realizes the remote wireless two-way communication, applicability is wide and has broad market prospects.

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