The Design and Research of Student Attendance System Nodes Based on RFID

Zhang Yuru[1], Chen Delong[1], Tan Liping[1]

[1]School of Computer and Information Engineering, Harbin University of Commerce,

150028 Harbin, China

Abstract. In the recently years, the main student attendance mode is named by teacher in great majority university. The kind of named is not only waste class time, but also can not be truly reflection the really student attendance. In response to this situation, student attendance system node based on RFID has been proposed. This proposes based on embedded ARM and RFID technology, more suitable for the student class attendance management. The student attendance system has LCD information display function, user login function, student information management function and classroom&student information display function.

Key words：ARM, RFID, QT

1   Introduction

Students is the largest union in the study environment of university, so it is hard for managing student things. Especially, in the respect of student class attendance, the original named style is hard to response the really situation of student attendance[1].

Therefore, the design of student attendance system based on RFID has significant reality meaning. The system not only can improve the work efficiency, students' study and development, but also can save human and material resources.

2   The principle of system work

When students who have RFID tag walk through the door of classroom, RFID reader will recognize the EPC of RFID tags, and then the EPC will be displayed on LCD. At the same time, the EPC will be sent to PC by TCP/IP net. The data management system will search database to get the information of student.

3   Structure of the system

There are three part of the system: RFID tags, RFID reader, Database disposed system based on PC.

In order to determine the type of RFID tag, conducted the width of the door of classroom. In the last, we determine the width of the door is 147cm. Therefore, we choose the ultrahigh frequency tag whose work frequency is 300Mhz~3Ghz and the classical readable distance range is from few meters to ten meters[2],read-write, passive RFID tag to design the system.

4   The design of RFID reader

RFID reader is an equipment that can read information from tags. Its main task is sent read signal to tags, and receive signal from tags, then transport the identification information to host computer[3][4]. The structure of RFID reader is:

(1) the main processor is s3c2410 which is a kind of chip that belong to ARM9 series. s3c2410 chip integrates a wealth of on-chip functions, such as: the MMU virtual memory management, LCD controller, external memory controller, 3-channel serial port, NAND flash controller, 117 general purpose IO and 24-channal external interrupt sources, 8-channel 10bits ADC, 2-ports USB host and USB device port, at the same time, RTC has a calendar function, greatly reducing the cost of the system[5].

(2)LCD display module. The s3c2410 internal has integrated LCD controller. We choose 320*240 resolutions and 565 format TFT screen.

(3)Communication interface module. DM9000AE is an ethernet chip that used to network communications, which connected to Bank2 of s3c2410.

s3c2410 supplied 3-channel RS232 serial port. UART0 is used as ARM terminal, UART1 is used connect to RF transceiver module for communication.

(4)Memory module. In the system, we use K9F1208 NandFlash chip. In the development board, SDRAM is HY57V561620 chip.

(5) RF transceiver module. We use M5e-C RFID read-write module whose work frequency is 915MHz.

(6)Power module, the supply voltage of s3c2410 is DC5V，through the LDO chip AS1117-3.3V and AS1117-1.8V, the voltage 5V has changed into 3.3V, 1.8V work voltage.

5   QT programming

Application of the subject is divided into two main parts, the application designed for the LCD screen and PC background data processing program[6].

(1) When design the LCD screen application, we use QWidget class, QLabel class, QTimer class, QtNetwork class, QLineEdit class, QdateTime class and qextserialport class, these classes are used to achieve the LCD screen application. The
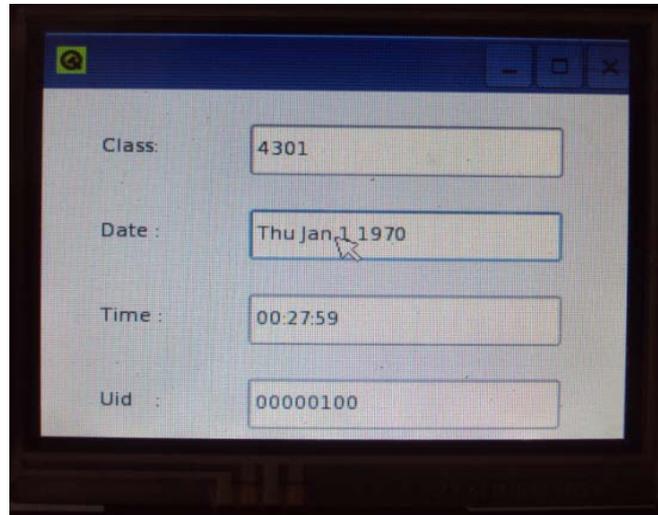
result of LCD display is shown as Fig.1.

Fig.1. LCD display

(2) PC background data processing program include: login interface, database management interface, classroom display window.

6   Conclusion

Combined with the actual situation of college students class attendance system, the design of student attendance system nodes based on RFID has be proposed. In this paper, the hardware node of system and the develop processes of related application have been detailed presentation. The designed system not only can improve the work efficiency, students' study and development, but also can save human and material resources.

References

1. Meihua Mao.: Design and Development of Attendance Management System Based on RFC. Information Technology, vol.8(4),pp:73--75(2010)
2. Charly Jason.: MF RC500 Highly Integrated ISO14443A Reader IC Design DataSheet. IEEE Communications Letters(2009)
3. Xuefeng Du.:Management Information System of Attendance and Assessment of Undergraduate. JiLin University,30--31(2010)
4. Dong Chen.: Design and Implementation of Web-based Attendance System. XiDian University(2010)

5. Xi Wen.: Design and Implementation of Teacher Attendance Management System. NanChang University(2010)
6. Zhiming Cai, Fuchuan Lu, Lixia Lee.: Publishing House of Electronics Industry :Proficient QT4 Programming. Beijing:(2011)