

Design and Implementation of Android Remote Power Control System

Tsung-Han Wu^{a,*}, Ping-Huang Wu^b

^a Dep. Computer Engineering, New York University

^b Dep. of Electrical Engineering, Tungkang University, Taiwan

E-mails : pokely0122@gmail.com, johnwu.0825@gmail.com

Abstract : *The traditional power control system is not effective because of its inconvenient and excessive cost. The “Android Remote Power Control System” can decrease the cost without using the manpower as the security guards to observe the power system through the monitor surveillance camera. And its efficiency is more effectual than the traditional power control system by monitoring the power system via the customized power control system APP written by MIT APP Inventor for the Android smart phones.*

Keywords: Data acquisition, Remote Control, Android, Power Control System

1. Motivation and Purpose

The traditional power control systems usually require manpower like security guards to observe the circumstance on the monitors through surveillance cameras for 24 hours a day, 7 days a week[1-4]. If any accident occurs when the security guards have distractions throughout the work hours, then the power control system will not be able to make appropriate decisions to solve the crisis.

As the next-generation technology arises and the safety awareness of citizens increases, the modern power control system start applying artificial intelligence; with the concern of saving manpower consuming and deduction of carbon dioxide released, the “Android Remote Power Control System” can avoid any possible oversight made by humans, and its effective monitoring methods can resolve the ineffectiveness of traditional power control system by decreasing the power consumption.

2. Methods and Theory

This paper used the PLC (Programmable Logic Controller) as the control load and the tool for capturing the data from the

digital multi-meter[5-6]; the data from the digital multi-meter was upload by the PLC Internet module via the wireless internet, and the PC (Personal Computer) can received the data by using the Visual Basic.

The Visual Basic commands the ON and OFF order to control load directly and observe the latest circumstance of the control load through the webcam. Simultaneously, the Visual Basic save the data into the database called MySQL(Structured Query Language)[7].

The server was constructed on the same PC we used, and the captured data was shown as an organized chart via the PHP(Personal Homepage) webpage , and control load function was achieved with data transferring among the PLC and the Visual Basic[8].

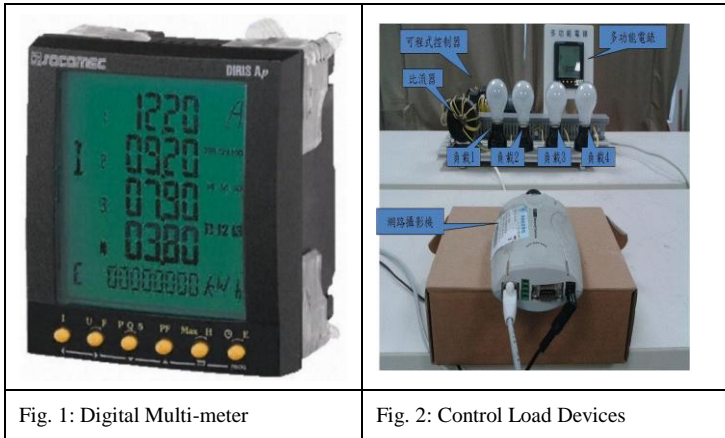
On the other hand, the Android operational system cooperates with the server built on the PC, so that the customized power control system APP user can receive the latest information about the control load.

3. Android Remote Monitoring System Implemental Manual

The following figures show the actual circumstance during project implementation:

Fig.1 and Fig.2 indicate the actual hardware. Fig.3 indicates the flow chart of Android remote monitoring system. Fig.4 and Fig.5 indicate the APP panel. Fig.4 shows the function list and machine information, when staff entered this function, through this interface, understanding the basic information of the server and the staff list. Fig.5 shows the instant image and remote operations service. From this function list ,and enter this function, the staff can know these information like electrical power, loading situation and see the instant image, thus, users

can control them effectively. Fig.6 indicates the partial program codes used in the MIT App Inventor2[9].



```

when titleClock1.Timer
do
  if get global titleclock = "0"
  then
    set global titleclock to "1"
    set Label1.Text to L2.Text
  else if get global titleclock = "1"
  then
    set global titleclock to "2"
    set Label1.Text to L3.Text
  else if get global titleclock = "2"
  then
    set global titleclock to "0"
    set Label1.Text to L1.Text
  
```

Fig. 6: Partial Program Code of the APP

4. Conclusion

The benefits of the “Android Remote Power Control System” are listed in the following:(1)Capable of controlling the on/off output of the PLC. (2)High compatibility with multiple consoles. (3)The cost of this project comes from hardware, and the software can be obtained without cost.

The product does not only save the cost of using traditional power control system, but also it can be used in the smart house. Once the product is fully completed and packaged, it can be on the business.

5. References

- i. TNU power monitoring system, <http://140.129.117.243/>, available April 2016.
- ii. KLD Inc., <http://www.kld.com.tw/webpage/home.htm>, available April 2016.
- iii. Wu, P. H., Kuo, C. H., Yen, C. Z., & Wu, T. H.(2010). Design and Implementation of Remote Data Acquisition for College-level Laboratory Course, International conference on ICT in Teaching and Learning (ICT 2008), pp. 219-224, 7-8 July 2008, Hong Kong.
- iv. Wu, P. H., Wu, T. H., Yen, C. Z., & Liu, I. F. (2010). Design and Implementation of a Power Monitoring and Management System Using Smart Phones, Annual ASEE Global Colloquium on Engineering Education (ASEE 2010), GC 2010-118, 18-21 Oct. 2010, Singapore.
- v. FATEK, <http://www.fatek.com/tw/>, available April 2016.
- vi. SOCOMEC digital multi-meter, <http://xieyucheng.cht.b2b168.com/shop/supply/1121144.html>, available April 2016.
- vii. MySQL, <http://www.mysql.com/>, available April 2016.
- viii. PHP, <http://php.net/>, available April 2016.
- ix. MIT App Inventor2, <http://appinventor.mit.edu/>, available April 2016.

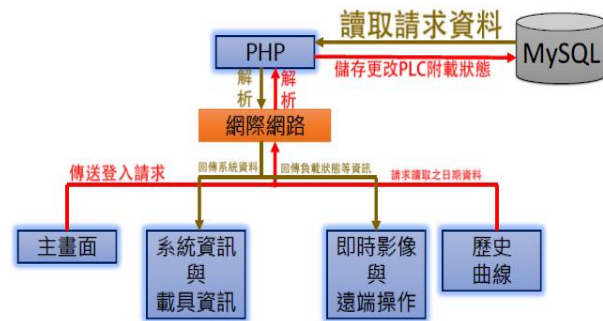


Fig. 3: Android Remote Monitoring System Flow Chart



Fig. 4: The Manual Window of the APP On Android



Fig. 5: The Operational Window of the App On Android