American Research Journal of Computer Science and Information Technology
ISSN: 2572-2921
Volume 4, Issue 2, pp: 1-5

AMERICAN RESEARCH JOURNALS
An Academic Publishing House

Research Article Open Access

Design and Development of Cloud Platform-Controlled Camera Preset Linkage Testing System

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Abstract: Currently, tremendous cloud platform-controlled cameras are used monitoring module of supplementary control system at intelligent substation. However, cloud platform-controlled cameras has no unified network access permission testing standard, which lead to cloud platform-controlled cameras used by supplementary control system at intelligent substation varied largely in quality and brings negative impact.

The paper made a study on the interactive functional requirements and communication protocol between the sub-system of video monitoring and the dynamic environment as well as the entrance guard system. The designed testing system simulates working environment of intelligent substation and will carry out simulation testing against cloud platform-controlled cameras to access the network and thus to standardize cloud platform-controlled cameras accessing network regulation.

Keywords: supplementary control system; testing system; cloud Platform-controlled

Introduction

At present, some substations have built monitoring systems, monitoring equipment operation, accident alarm video and so on. The control of the electric platform is realized by two executive motors. The motor accepts the signals from the controller to accurately operate and locate [1]. Under the function of control signal, the camera on the platform can scan the monitoring area automatically, and also track the monitoring object under the control of the staff on duty in the monitoring center. A large number of pan-platform cameras are used in the monitoring of substations. Because of this, the testing object and the testing task are becoming more and more complex, which is the current linkage function. The test system puts forward higher requirements.

Based on the monitoring platform of intelligent auxiliary control system in smart substation, this paper develops a test subsystem of preset position linkage function of the pan-tilt control camera, unifies the criterion of the pan-tilt control camera entering the network, and enhances the maintainability, security and reliability of the monitoring platform of the intelligent auxiliary control system, so as to make the Smart Substation safer. Reliable.

The Overall System Design

The Selection of Hardware platforms

This topic chooses PC and gigabit network card as hardware development platform.

The Selection of Software Platforms

1) the development platform of the system

This topic chooses Windows platform as software development platform.

2) the development tools of the system

This topic chooses Visual Studio 2012 as the development tool.

3) the type of communication protocol

This topic chooses TCP protocol and IEC60870-5-104 network communication protocol as communication protocol.

The Software Architecture

The software designed in this paper is composed of modules in the figure, in which accessory aided interface and humidity aided interface and network communication module can interact with the main interface, while the equipment status and message display, between the module and the main interface, between the access control status adjustment module and humidity status adjustment module and accessory and humidity aided interface. Data can only be transmitted unilaterally. The system block diagram is shown in Figure 1.

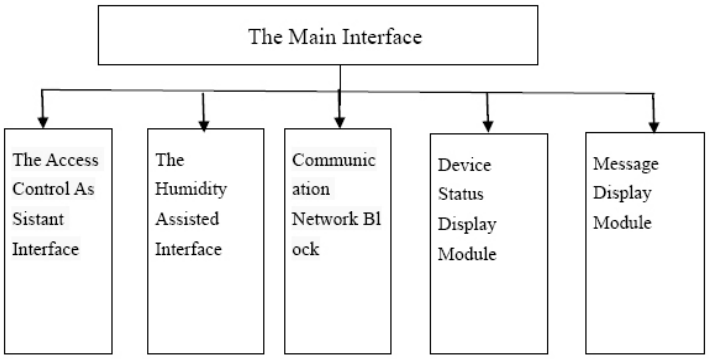

Fig1. *System block diagram*

The Detailed Design

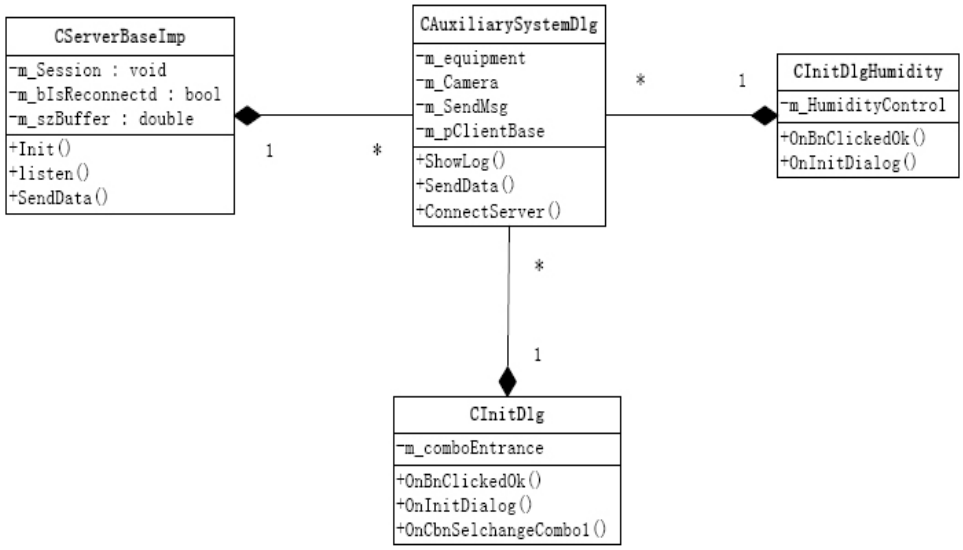

Fig2. *The Class diagram*

Main Interface Class

Class name: CAuxiliarySystemDlg.

The function of the main interface module is to simulate the simulation state and provide an operation interface for testing. When the user clicks on the humidity or access button in the main interface, he calls the humidity

assistant interface class (CInitDlg Humidity) or the access guard assistant interface class (CInitDlg) to modify the operation, and then through the network communication class (CServerBaseImp) and the main station. Communicate.

The Class of Access Control Assistant

Class name: CInitDlg.

The function of Access Control Assistant Module is to assist the main interface to perform the operation of access control status change. It provides an auxiliary status change interface for the main interface and is a tool for the main interface module.

The Class of Humidity-Assisted

Class name: CInitDlgHumidity

The function of the humidity assistant module is to assist the main interface to perform the humidity state change operation. It provides an assistant state change interface for the main interface and is a tool for the main interface module.

The Class of Network Communication

Class name: CServerBaseImp

The network module is a tool of the main interface module, which provides the function of receiving the information of the main station and sending the information to the main station. Besides the active operation of the main interface, it also needs to receive the message of the main station and respond to the message matching the received message.

The System Test

The Test of Access Control State Change

When the dynamic environment is simulated, the access control state is initially set to close, and the pan-tilt control camera is in the preset position 1 state. When the access control state is changed to open, the pan-tilt control camera is transferred to the preset position 2, and the access control state is initially set to close as shown in the figure3.

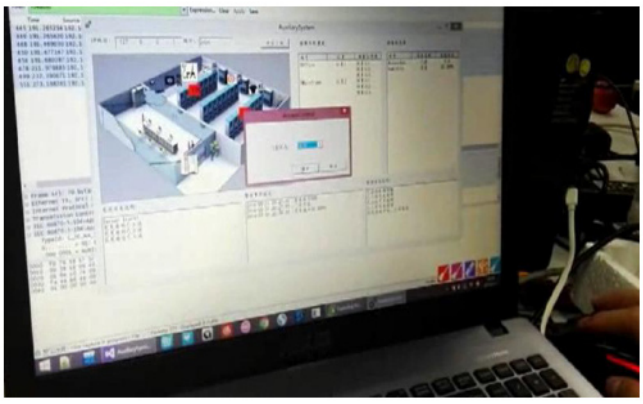

Fig3. *Initial setting of access control status*

Moisture State Change Test

In the simulation of dynamic environment, the initial value of humidity state is 0, and the camera controlled by the platform is in the preset position 2. When the humidity value exceeds the alarm upper limit, the camera controlled by the platform is transferred to the preset position 1, as shown in the figure4.

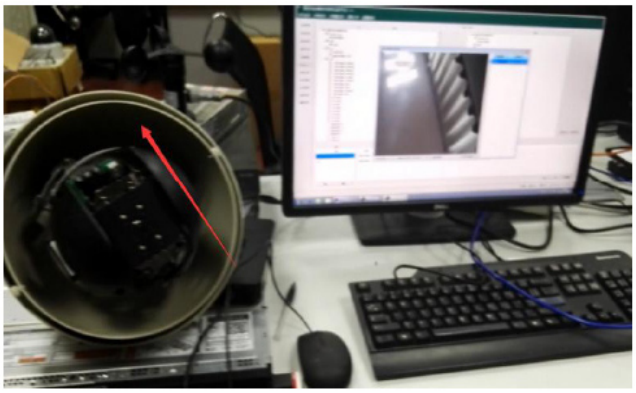

Fig4. *The humidity state pan control camera preset position 1.*

The Test Conclusion

In the auxiliary system of smart grid, the video surveillance host adjusts the preset position of the Yuntai control camera according to the equipment status of the power environment host to monitor the equipment status of the power environment host. In the test, the Yuntai control camera acts accordingly on the status change of the simulation power environment host and imitates it. The real software completes the test of the camera equipment controlled by the platform. This design completes the research and development of the test system for the preset linkage function of the pan-tilt control camera, and finally realizes the simulation test of the pan-tilt control camera in the working environment of the intelligent substation, which achieves the goal of unifying the criterion of pan-tilt control camera entering the network.

Conclusion

In this paper, MFC is used as the main framework of PC platform, TCP protocol and IEC60870-5-104 communication protocol are used as network communication protocol, and the research and development of the test system for the preset linkage function of the pan-tilt control camera is completed. Finally, the simulation of the working environment of the intelligent substation is realized to simulate the pan-tilt control camera which will be connected to the network. The test achieves the goal of unifying the specification of the pan-tilt control camera entering the network.

Acknowledgement

This research was financially supported by Department of Science and Technology of Sichuan Province under grant number 2019YFG0131.

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Citation: **Xiao-Na Xie, Zheng-Wei Chang, Jiang-Lin Zhang, Chang-Jian Deng, "***Design and Development of Cloud Platform-Controlled Camera Preset Linkage Testing System". American Research Journal of Computer Science and Information Technology; vol 4, no. 2, 2019; pp: 1-5.*