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New Ferroelectric Material Technology in Remote Electrical Control System of Smart Home

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Abstract: Smart homes are changing with each passing day, and home automation has become a trend, with broad application prospects. This study is based on the design of the remote electrical control system for smart homes combined with the application of new ferroelectric material technology to conduct experiments, aiming to demonstrate the feasibility of adding new ferroelectric materials to improve the functions and performance of the remote electrical control system. The article first introduces the concepts and development of electrical control systems, smart home remote control and other parts in detail, which are applied to cloud computing, digital control systems, etc. Based on the previous theoretical foundation, this research also designs and implements a rule-based smart home device linkage engine, and expands the existing components of the "smart home platform" to add the ability to support device linkage, and finally realize a complete device linkage function. This part focuses on the performance of ferroelectric materials. Experimental results show that the smart home remote electrical control system designed by this research has been optimized to a large extent after applying new ferroelectric material technology. From the data obtained in this study, whether it is in the data transmission module or the receiving module, the stability and reliability of this process are more superior than the conventional electrical control system. Among them, from the perspective of stability, before the ferroelectric material is added, the stability of the data receiving and sending module of the conventional electrical control system is at a relatively low level. The application of ferroelectric materials makes the test results greater than 6 and even reaches 8.19 in the data receiving module.

1. Introduction

People are not only satisfied with the basic lifestyle, but also increasingly pursue high-quality living conditions. With the improvement of social awareness and understanding of family life in the new century, centralized control of multiple sources has become more and more important [1]. With the introduction of smart home design, the development of the home appliance center has entered a new stage. With the increasing popularity of the Internet, the amount of information sharing continues to increase, and data collection and management in many applications, home applications, and enterprise applications are slowly moving to the Internet. The digital home control system allows people to control any electrical appliances in the home anytime and anywhere through the remote control, mobile phone or the Internet, allowing people to enjoy a simple, modern and comfortable lifestyle through high technology [2].

A home installed with a smart home system is called a smart home. As a basic practice point for smart residential communities and smart cities, a smart home plays a significant role in the development of smart cities [3]. With the continuous reduction of embedded hardware costs and the continuous improvement of embedded technology, smart home appliances are marching towards the embedded direction with a prosperous attitude. As a new type of energy storage device, energy-saving devices have the advantages of high power density, long life, safety, reliability, and pollution-free. Electrodes are an important part of supercapacitors and play an important role in the electrophysiological functions of supercapacitors [4]. Electrode devices have a major impact on the electrochemical performance of supercapacitors. It is particularly important to ensure the safety, reliability, energy saving, and flexible operation of household electrical system design. Therefore, the research and development of electrode devices with superior performance and suitable for mass production of supercapacitors has become a research topic of supercapacitors, which has received extensive attention from scientists [5].

One of the most challenging issues related to the operation of smart microgrids is the optimal energy management of residential buildings, which involves multiple and often conflicting goals. Considering the meaningful balance between energy saving and comfortable lifestyle, Anvari-Moghaddam A has developed a multi-layer design model to realize energy usage in smart homes. In order to verify the effectiveness and robustness of the proposed algorithm, multiple simulations were performed in different scenarios using real data, and the results obtained were compared in terms of total energy consumption cost, user convenience rate, and thermal comfort [6]. D Cook uses smart homes and wearable sensors to collect data, while (n=84) elderly people perform complex activities of daily living. Use machine learning technology to analyze the data and reveal that the differences between healthy elderly and adults with Parkinson's disease not only exist in their activity patterns, but these differences can be automatically identified. Permutation-based tests confirmed that the sensor-based differences between these groups are statistically significant [7]. The system designed by Lee Y T is on the home side. It forms a home intranet by integrating a fixed touch screen with a home controller system and various sensors and devices to provide energy, scene information and security functions. The community side includes community servers and community personal computers, and is connected to equipment in other community systems (for example, cameras and building automation equipment) and home networks [8]. In the smart metering management system, utility companies use a variety of incentives, such as demand response plans, usage time, and real-time pricing to encourage customers to reduce load during peak load periods. However, it is often troublesome for residential customers to manually respond to prices that change over time. Collotta M proposed an artificial neural network (ANN) as a support

for Bluetooth Low Energy (BLE)-based home energy management (HEM) systems, called BluHEMS [9]. Hamodat Z has developed a whale-optimized fuzzy PID controller to manage automatic power generation control in multi-regional power systems with availability-based tariff (ABT) pricing schemes. Minimize the power production cost, regional control error (ACE) and marginal cost of the multi-regional power system. The power generation, tie line power deviation and frequency deviation of the interconnected three-zone power system including hydrothermal steam power plants and gas-fired power plants are strictly measured and analyzed [10]. The Korzeniewski M research equipment allows the control of dual active bridge (DAB) converters and real-time remote control of them via an IP-based network. DAB converters offer the possibility of controlling and managing the energy between two DC power systems with very different voltage levels. Through the IP-based network and power electronic converters, not only can easily control information, but also can easily control energy quality, trend direction and energy storage system [11]. Takada M proposed a new QoS control method. It realizes delay guarantee and high throughput at the same time, and controls the transmission speed of TX data according to the estimated network bandwidth. A commercial cellular network is used to evaluate the performance of the proposed method. The proposed method can achieve delay guarantee and high throughput, while measurement without control can only achieve high throughput [12]. These studies are all focused on smart home systems and electrical remote control systems, but they are mainly focused on the application of the system, and there are relatively few studies on the interior of the system, such as materials. A more complete application can be developed by studying the material optimization problem inside the system.

Extensively collect related technologies related to synchronous control systems, deeply analyze the current research progress of related synchronous control technologies, and clarify the research direction, design and implement rule-based smart home equipment linkage engine. The equipment linkage engine has three functional modules: rule analysis, fact generation and action processing. Using software technology to analyze and query, software models, overall design, system testing, etc., to finally achieve all tasks set by the system, it is an ideal low-cost and practical building management system. Indoor sensor network layout, real-time retrieval of indoor environmental parameter information, statistics, analysis and statistical analysis of indoor environmental parameter information. Through the wireless network to identify the interaction between the control node and the central system controller, the technology can see the network configuration itself, and new nodes can automatically join the network through scanning, which is convenient for network expansion and maintenance. The system designs multi-level device names according to the actual structural characteristics of the smart home. The device name is combined with the forwarding strategy to limit the forwarding range, so that the interest packet can reach the actual geographic location of the node more easily.

2. The Significance of the Application of Ferroelectric Materials in Smart Home Remote Control Systems

2.1. Development Status of Smart Home

Smart home is also called smart house. Users can manage home equipment more conveniently and intelligently through a unified management interface, and enjoy the convenience brought by technology [13]. As more and more companies invest in the research and development of smart home systems and customer requirements for products, home products will also become more complete and more efficient. The services provided will also become more and more humane, and

the technology will move towards the veteran. The development of "Internet +" and Internet of Things technology provides technical support for the further development of smart homes and opens up new horizons for the expansion of the smart home market. With the rapid development of network technology and communication technology and the continuous improvement of human life requirements, it has become an impossible trend to realize intelligent remote control of the home [14]. Through the home management altar, the system integrates multiple physical systems related to home life, and is responsible for the management and control of building materials. Smart home automation and external network communication technology have become the main factors leading to low product availability [15].

Modern smart homes need to be able to ensure the safety of the home environment, improve the comfort of living, and promote the development of residential areas. Extend modern smart home systems to combine technologies such as the Internet of Things, embedded and cloud computing to connect home devices to a unified network and centralize operation and control [16]. The perception network of perception control is composed of components such as sensors, trackers, routers, and controllers, and is responsible for obtaining detailed data of objects or performing communication processes [17]. The smart home control system can easily manage household appliances and multimedia devices, and capture family information by setting sensors and camera accessories. In the smart home system, the sensor segment can capture environmental information and transmit the data to the organizer through the ZigBee process. Need to expand to dozens or hundreds of communication segments, wireless communication modules can realize point-to-point or point-to-multipoint communication, which is not suitable for networking communication. But terminal nodes include sensor nodes and execution nodes. The former is responsible for collecting various indoor information and uploading it to the coordinator, while the latter is responsible for receiving commands from the coordinator and controlling the actions of home appliances [18]. The network transmission and classification of large amounts of data generated by sensors, as well as the continuous expansion of the meaning of terminal resources, have become existing problems in smart homes. The family control plan is the core of the community housing allocation plan, the main component of the community management system, and the center of family resource management and planning [19]. Including smart doors, comprehensive information controllers, site control, wireless relays, smart sockets, smart switches, telephone controllers, network controllers and conference boxes. It enables users to know the details of the home appliances managed in time through telephone contact, enabling the product to realize interactive understanding, serial support and comparison control. The remote control structure of the smart home is shown in Figure 1.

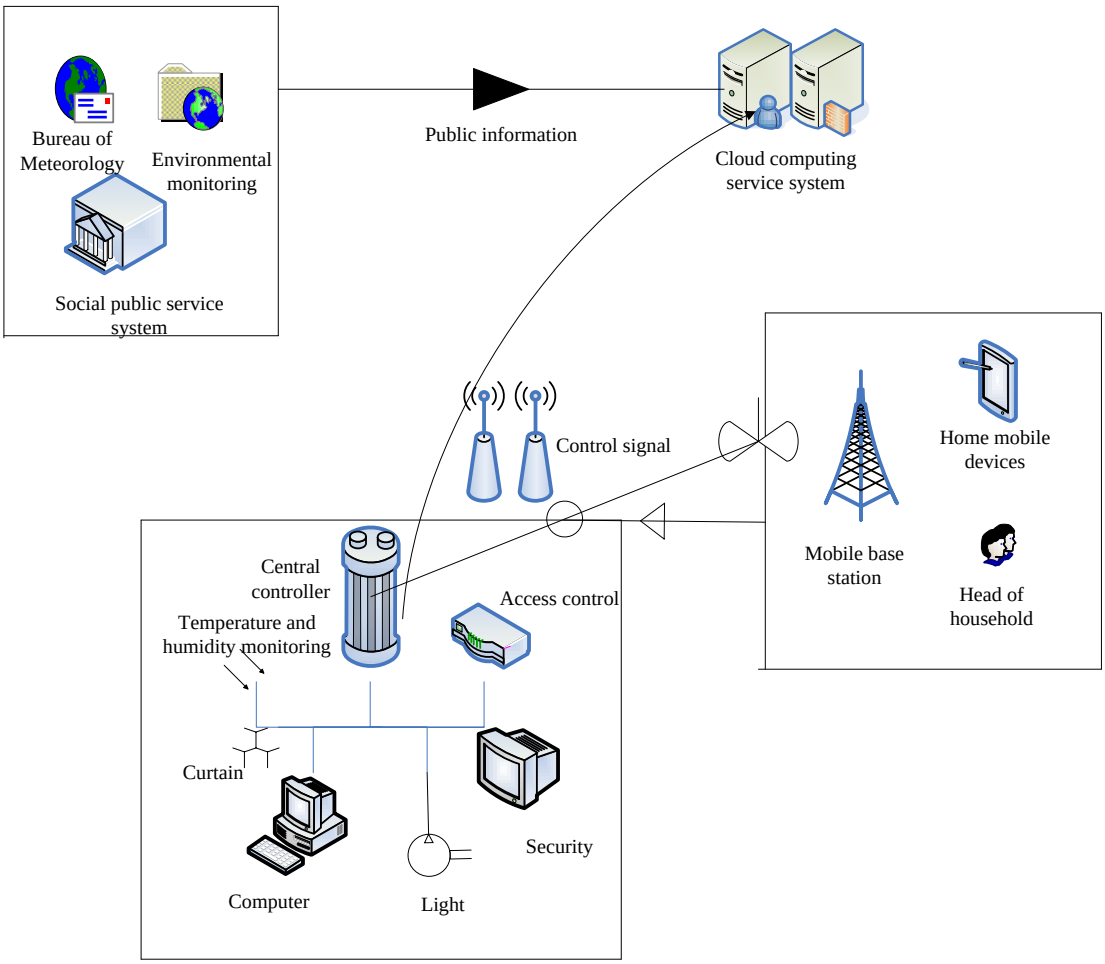

Figure 1. Smart home remote control system

2.2. Design Principle of Remote Electrical System

Building electrical technology covers and includes technologies such as electrical energy, electronics, communications, and computers. Electrical equipment is an integral part of the safety function of the power system, and the selection of electrical equipment is one of the main components of the company's basic design. High-performance and high-performance electrical appliances have developed rapidly in recent years, reducing fuel efficiency and so on [20]. In the power system, reciprocal compensation generally takes the form of hierarchical distribution and area balance. Regenerative power needs to have a certain degree of flexibility and an appropriate amount of backup power. The microprocessor C8051F380 single-chip microcomputer is connected to the temperature sensor and the pressure sensor through the P3.0 port and the P3.1 port respectively, and receives the input and temperature data of the controller. It is connected to the data communication module through the serial port 1 to control the upload of terminal data by the communication module, and receives the control instructions issued by the measurement and control center platform [21]. System integration is from the engineering point of view. Because there are many devices in each subsystem, and the functions of different devices are different, the equipment manufacturers used are different, so their communication protocols are not the same. The design structure of the remote control electrical system in this experiment is shown in Figure 2.

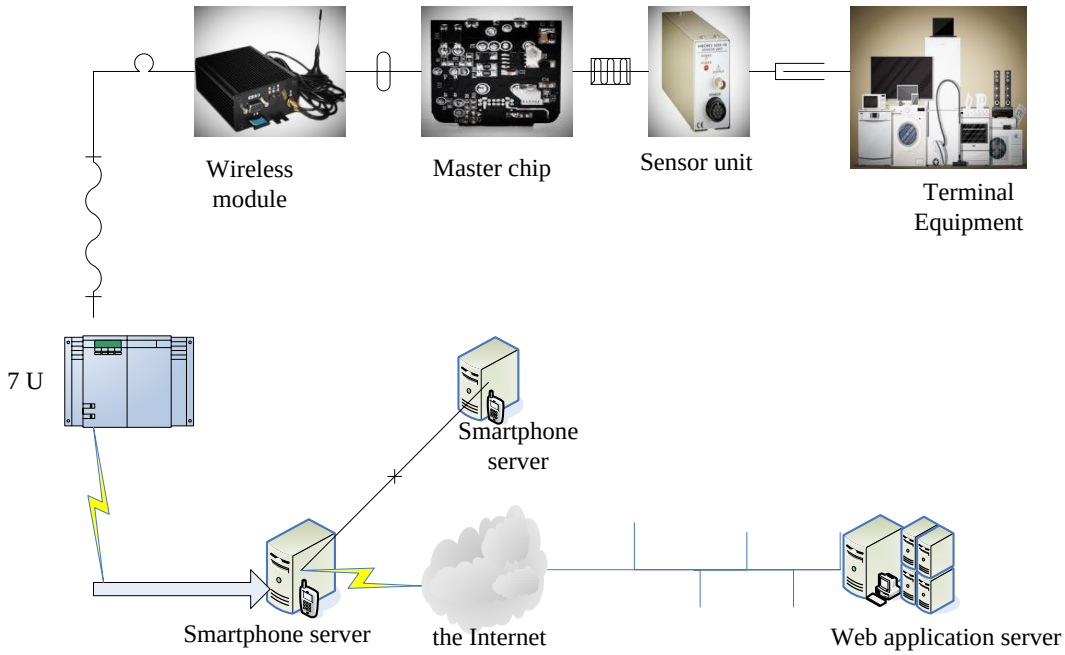

Figure 2. Electrical system structure design

At the equipment level of the system, the on-site controller controls the on-site equipment through a pre-set program without human intervention, and at the same time can make corresponding responses according to the instructions of the host computer. Applying the neural network to system identification can realize that the neural network acts as a dynamic mathematical model of the controlled system [22]. Combining the advantages of virtual network, short model time, and simple computer simulation, individualized learning and customized architecture can be obtained when the model process is not perfect. In the case of interacting with external information, create a non-linear map form or linear dynamic system. The field controllers in the same area are connected to the same field bus through the network topology, and the information transmission function with the upper computer is realized through the gateway. The microprocessor module is the core part of the entire terminal, which controls and processes other sub-modules, realizes the major functions of the terminal system, and ensures the normal operation of the entire system. The data communication module realizes the data communication between the terminal and the remote measurement and control center, completes the upload of terminal data, and receives remote control instructions. The motor control module controls the rotation of the motor, adjusts the valve opening of the pressure regulator, and adjusts the outlet electrical pressure [23].

2.3. New Ferroelectric Materials

With the advancement of technology and technology, there is an increasing demand for miniaturization and new multifunctional equipment. In view of the wide application of magnetism and ferroelectrics in modern technology, multiferroic materials are both magnetic and ferroelectric, which has made a great contribution to the miniaturization and multi-functionalization of sensors and magnetic storage devices. The intensity of the applied electric field increases, and the degree of domain turning is increased. When the applied electric field reaches the maximum value, the electric field is saturated, the ferroelectric material presents a single domain state, and the

polarization intensity is also close to saturation at the same time. Large ferroelectric polarization, strong magnetization, and high critical temperature are all required characteristics in practical applications. Exploring how to realize the coexistence of ferroelectricity and magnetic intrinsic micro-mechanism has always been the focus of multiferroic research, and it is also a challenge that needs to be faced [24]. The electrode is composed of a current collector and an active material, wherein the active material is coated on one side of the current collector. Active materials play a role in energy saving and environmental protection in energy, and are an important part. The current collector plays a role in carrying active materials in supercapacitors. Supercapacitors use metal oxide as the electrode material, which mainly depends on the pseudocapacitance generated by the high degree of redox reaction that occurs on the surface of the electrode material. The electric polarization does not have spatial inversion symmetry but remains unchanged under the spatial inversion symmetry operation. By studying the interaction between defects and microstructures in ferroelectric materials, in-depth exploration of the failure mechanism of ferroelectric materials has better theoretical guiding significance for the reliability design of smart components. Practical applications require both large electric polarization and strong magnetoelectric coupling. Exploring and synthesizing new single-phase multiferroic materials, especially multiferroic materials with large electrical polarization and strong magnetoelectric coupling, is of great significance to the study of the physical mechanism of multiferroicity and the promotion of potential applications.

Electrode materials are an important condition for obtaining high-performance supercapacitors, and a single material cannot meet the requirements of high-performance supercapacitors, so composite materials have become a research hotspot in supercapacitor electrode materials [25]. The matrix of iron-based materials is mostly a bad metal with higher resistance at high temperature, but at low temperature, the phase transformation of the antiferromagnetic structure will form an orthogonal fringe antiferromagnetic sequence. The highest transformation temperature of 55K found in iron-based materials is much lower than the 164K of copper-based materials. However, due to the large magnetic moment on iron atoms and the strong interaction between electrons and spins, the magnetism in iron-based materials has always been considered to be closely related to superconductivity. In superconducting materials, electrons can move without damping, and a "permanent" current can be formed after biasing. People sometimes put the strongest optical fiber into a magnetic field. When the magnetic field is removed, an induced current will be generated in the optical fiber. The current data in this way has not attenuated at all for many years. For the calculation of the amplitude of a single electron current, it can be expressed as:

$$V = \sum ln\, u\,(s)\, exp\left[m(i - i^{\prime}) \bullet s\right]$$

$$= \sum_{i=1} \int ln\, m_i\, exp \sqrt{i(L(i - i^{\prime}) \bullet (s-1)} \tag{1}$$

$$V_i = m \int_{i=1} lm(i)\, exp \| i(v-1) \| = m v_{i-1} \tag{2}$$

$i, i^{\prime}$ is the wave vector, $\int^{\int} ln$ is the symmetry, v is the electron number density, and L is the period. The distribution of electron concentration can be obtained through the inverse Fourier transform, which is an important means for us to understand the crystal structure. In other words:

$$J = \delta\gamma^{\prime\prime} A_0 \pm s + m\delta\gamma^{\prime} A_0 \pm s = \delta\gamma(\gamma^{\prime} - m\gamma^{\prime\prime}) A_0 s \tag{3}$$

$$f(s) = a * lq/lp = a \bullet lP/lp \bullet lq/lP = A \bullet \hbar \bullet lq/lP \tag{4}$$

$$G(p) = P_{i,o} + \oint i(p)lp / \sum_{i-1} l(l-1) \tag{5}$$

Among them, J represents a parallel plate capacitor, s is time, the rate of electric polarization is affected by p, and the electric polarization changes most rapidly with temperature γ'. That is to say, the polarized part can be flipped by the electric field and still maintain the polarization state after the electric field is removed. Although the non-polarized part can be flipped by the electric field, it cannot be maintained after the electric field is withdrawn and disappears with the disappearance of the electric field. The formula for the polarization state reversal change is:

$$\delta_i(\varepsilon) = \frac{\gamma^2}{K_0}\varepsilon^2\mu(i-1) + \delta_1'(\varepsilon) \tag{6}$$

$$\delta_2(\varepsilon) = \sqrt{2(\pi-1)^2/\varepsilon_{i-1}} - \frac{\pi}{2\varepsilon-1}\int_0^{\rightarrow}(\varepsilon_1' - l\varepsilon') \tag{7}$$

The low-frequency in-band response is gradually transferred to a far-infrared absorption peak δ_i, and the polaron model is used to fit it ε', and the iron-based material will become asymmetrical and linear.

3. Feasibility Experiment of Ferroelectric Material Application System

3.1. Smart Home Remote Control

Through the investigation of smart home appliances, it is found that the smart home appliance control system has huge development potential. However, because the control of smart home appliances mostly uses computers or smart phones for remote control, the market positioning is relatively high, suitable for high-income consumer groups, plus other factors, so that the popularization and promotion of smart home appliances has become relatively slow. The new type of computer is not only an ordinary personal computer, but can also contain a variety of new types of microprocessors. The close integration of computer and physical applications is a development strategy for current and current application development. Taking ordinary computer development software and application tools and systems as the starting point, use it to identify the most basic functions of many smart tools and devices. The application of virtual materials refers to this development method. The highest part of the virtual application program is to realize the tasks that can be realized by the actual application program. The relevant parameters of the main technology of the electronic proximity switch are shown in Table 1.

Table 1. Main technical parameters of proximity switch

Serial number	Project	The main parameters
Number 1	Size	35-69mm
Number 2	Action distance	12mm
Number 3	Current consumption	<30mA
Number 4	Corresponding frequency	40Hz
Number 5	Output	/

The application of cloud computing technology has brought new ideas and new development

trends to smart homes. During the programming process, this PIN is used to enter the programming circuit. In the normal time interval, the terminal sends out a positive pulse signal with the frequency of the oscillator. So it can be used as a pulse for external production or for temporary purposes. The purpose of power-on inspection is to ensure that the circuit boards of the entire circuit are in normal working conditions, all the crystal oscillator circuit and the reset circuit are checked, and the reset program is checked and debugged again. Through network communication technology, the Internet can monitor the test system. At every site on the Internet, any monitoring information on the test platform can be monitored by the system. Through the remote control system, the user conducts unified management of various household appliances connected to the network in the family, and queries and controls the running status of the household appliances in real time. If the equipment fails, the system automatically prompts the user and contacts the manufacturer through the network for maintenance, which greatly improves the efficiency of life. The distribution of performance test nodes is shown in Table 2.

Table 2. Distribution of performance test nodes

Building layer	Floor level	Room level	Device layer	Total number of devices
2	1	2	1	6
1	2	1	1	5
2	3	1	2	8
2	1	1	1	5
1	2	3	2	8
3	1	1	2	7

With the rapid development of modern science and technology and economic systems, the demand for operating power is increasing, and the requirements for the operation of these power sources are also getting higher and higher.

Another major part of the smart home remote control system is the controlled terminal, which includes terminal sensors and home appliances. The terminal sensor network part can include many sensors that need to be used in the home environment, such as common temperature sensors. These sensors, like household appliances, can transmit the corresponding status to the user's control terminal through the network, so that the system users can adjust and control the home environment anytime and anywhere. Embedded systems are different from ordinary computer systems, but they are connected at the same time. Application software can run directly on a general-purpose computer system with perfect functions. In the process of system software design, it is first necessary to plan the overall software structure and work flow, and then program and debug each module separately. Evaluate the relevant parameters of the overall characteristics of the embedded system, and the results are shown in Figure 3.

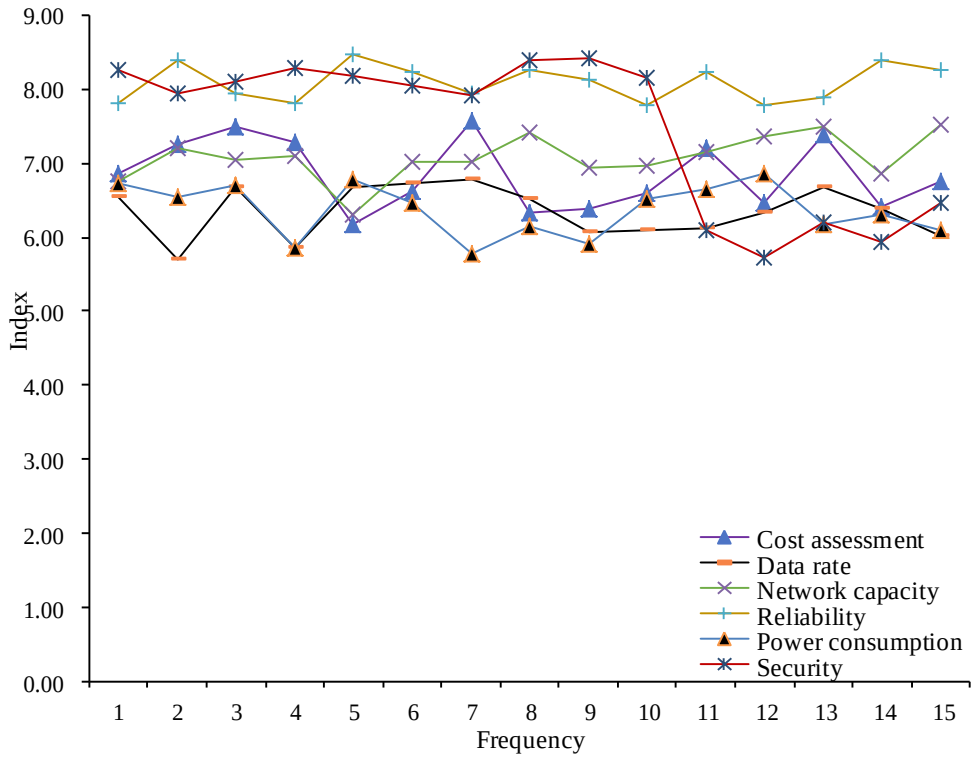

Figure 3. Embedded system performance

The system designed in this research has low cost, low data rate, large network capacity, high reliability, low power consumption, high security, etc. Device linkage refers to triggering the operation of another device or multiple devices when the operating state of one or more devices meets specific conditions. It is the main goal of the second stage of smart home development and the foundation of the third stage. The research and application of equipment linkage related technologies at home and abroad are still immature. There are mainly problems such as complicated user configuration, low execution efficiency, and failure to consider the conflict situation of equipment being triggered to perform multiple operations at the same time.

3.2. The Design of the Electrical System with the Participation of Ferroelectric Materials

The electrical automation control system technology began to extend and expand, and can gradually improve, through the extension of technology, make full use of microelectronics processing technology, and make certain progress. In the electrical circuit, the capacitor mainly achieves the filtering effect, and the synchronous control technology is a problem that needs to be considered. Capacitors play an important role in both electronic circuits and electrical systems. In electronic circuits, capacitors can be used as energy storage components and can also play a filtering effect in the circuit. In order to maintain the stability of electrical circuits and ensure that people's lives are not disturbed, it is very important to improve the safety and reliability of the circuits. Among electrical circuit faults, circuit breaker faults are the most prominent. Circuit breaker is one of the common terminal equipment of power system. Compared with the system current and voltage, it is uncertain. It is easy to produce over-voltage, inrush current, etc., generate

harmonic interference, and affect the stability of the power system. The level of intelligent development directly affects the stability and safety of the entire electrical system. Research on the electrical circuit synchronization control system can reduce the damage caused by the circuit breaker to the electrical equipment. At the same time, it can also extend the service life and maintenance time of the circuit breaker to ensure the safety and stability of the electrical circuit. The relevant parameters of the transformer are shown in Table 3.

Table 3. Related parameters of household transformers

Load name	Low-voltage side load capacity	Power Factor	Number of units
Living room	417+591	0.95	3
Kitchen	303+604	0.95	2
Toilet	587+321	0.95	1
Bedroom	417+591+472	0.95	2
Study room and lounge	1101	0.95	1
Computer room	463.1	0.95	3

Ferroelectric materials are materials with at least two instantaneous polarization directions, and the spontaneous polarization direction changes under the action of an external electric field. In the absence of an external magnetic field, each magnetic field has a random magnet direction, and polycrystalline materials do not exhibit macroscopic effects. When an external magnetic field is used, the magnetic field in the magnetic field is all converted to the direction of the magnetic field, which improves the orientation of the magnetic field in the material, which causes the material to stretch or decrease in the direction of the external magnetic field. Seting different pressures to test the server, and the test results are shown in Figure 4.

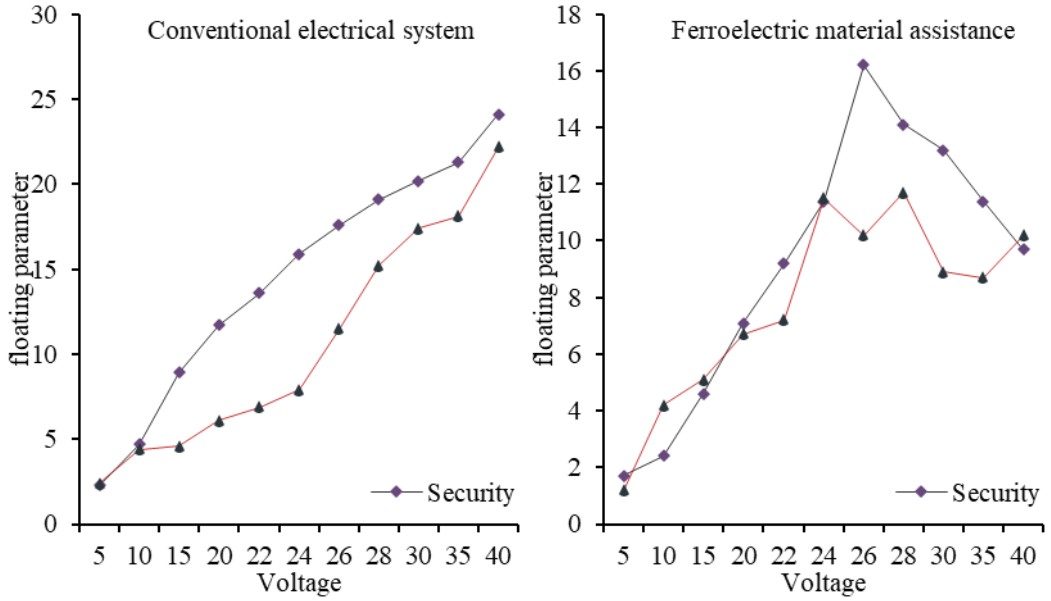

Figure 4. Voltage test

Capacitors are widely used in electrical circuits. Frequent switching of capacitors results in high inrush current, which promotes the welding of circuit breaker contacts. When the surrounding electronic devices have great electromagnetic interference, it will affect the normal working performance. Therefore, it is necessary to consider electromagnetic compatibility design to ensure that the system signal is not interfered. Designing a synchronous closing and closing control system can shorten the transient process of the circuit and effectively reduce the overvoltage of no-load circuit closing. According to the requirements of the operating system, periodically adjust the tap position to adjust the voltage to ensure the stability of the system voltage. To summarize the short-circuit conditions, the situation is shown in Table 4.

Table 4. Calculation results of short-circuit conditions

Short circuit point location	A	B	C	D
Rated voltage	10.05	0.8	0.8	0.8
Per unit value	42.39	1.887	27.24	0.0819
Famous value	22.17	1.06	17.224	0.0671
Impact value	66.23	11.81	40.24	0.125
Maximum effective value	33.86	1.52	25.89	0.0672
Short-circuit capacity	409.23	0.981	12.05	0.042

The system is only connected to lighting equipment in the early stage. After its performance is stable, it will be expanded to home appliances such as air conditioners, water heaters, TVs, etc., until the entire family is under the control of smart terminals. The lighting control system should reasonably control the ambient light according to different purposes and time, and provide lighting services that meet various needs. The remote measurement and control center platform (hereinafter referred to as the measurement and control platform) test is mainly aimed at the software debugging of the completed system platform and displays the corresponding platform interface functions. The structure of the lighting system is constructed, as shown in Figure 5.

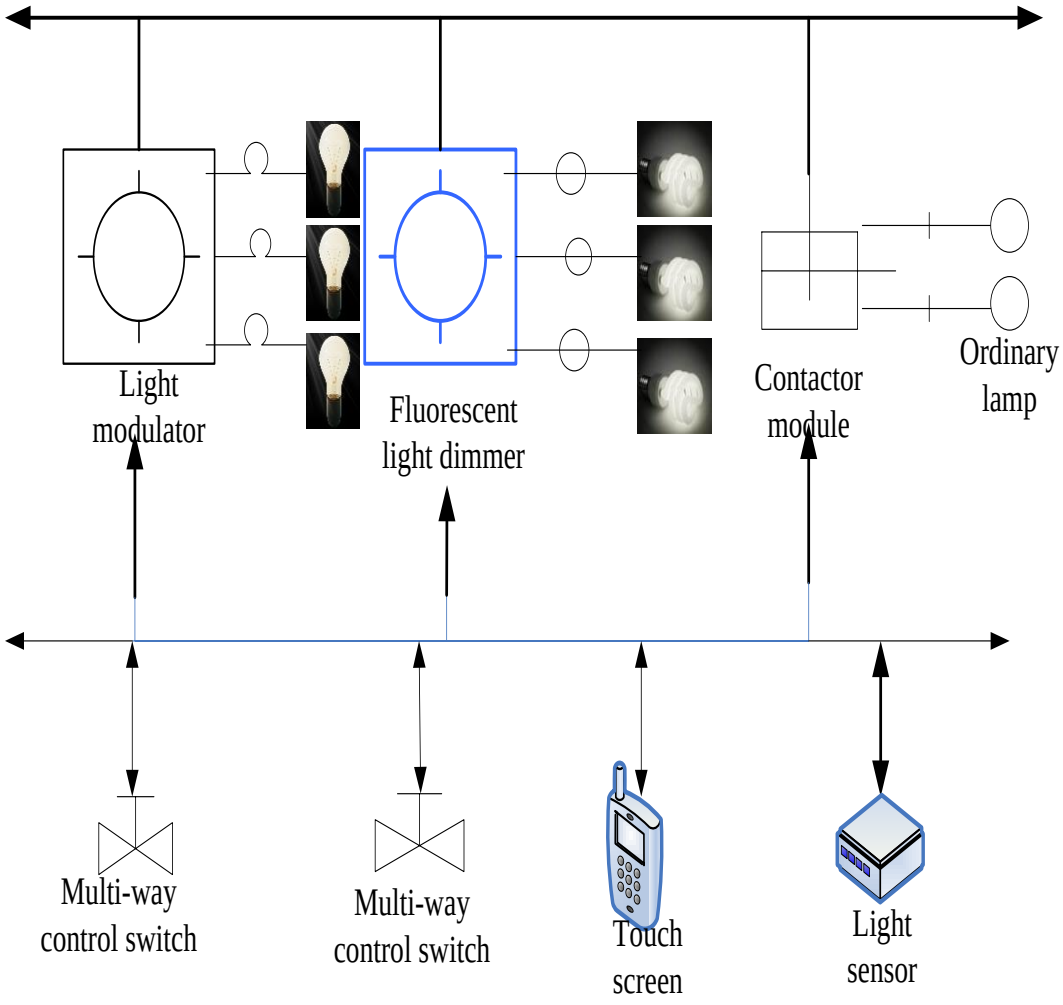

Figure 5. Lighting system structure

It can be thought of as data shared storage. Developers can use content provider cases to manage and share application databases, and use it to select application-related data distribution methods. Developers can also configure your own content data during programming, so that other applications can also use them to perform some calling functions, and you can also use these providers to access stored data. The most important part of the central control module is the central controller that has a decisive influence on the effect of the entire system. The central controller can not only receive the control signal transmitted by the user, but also can convert the signal into the software design on the MCU, and transmit the signal to the corresponding electrical equipment. From the data receiving module and the data sending module, the difference in the data processing of the system before and after the application of the ferroelectric material is recorded, as shown in Figure 6.

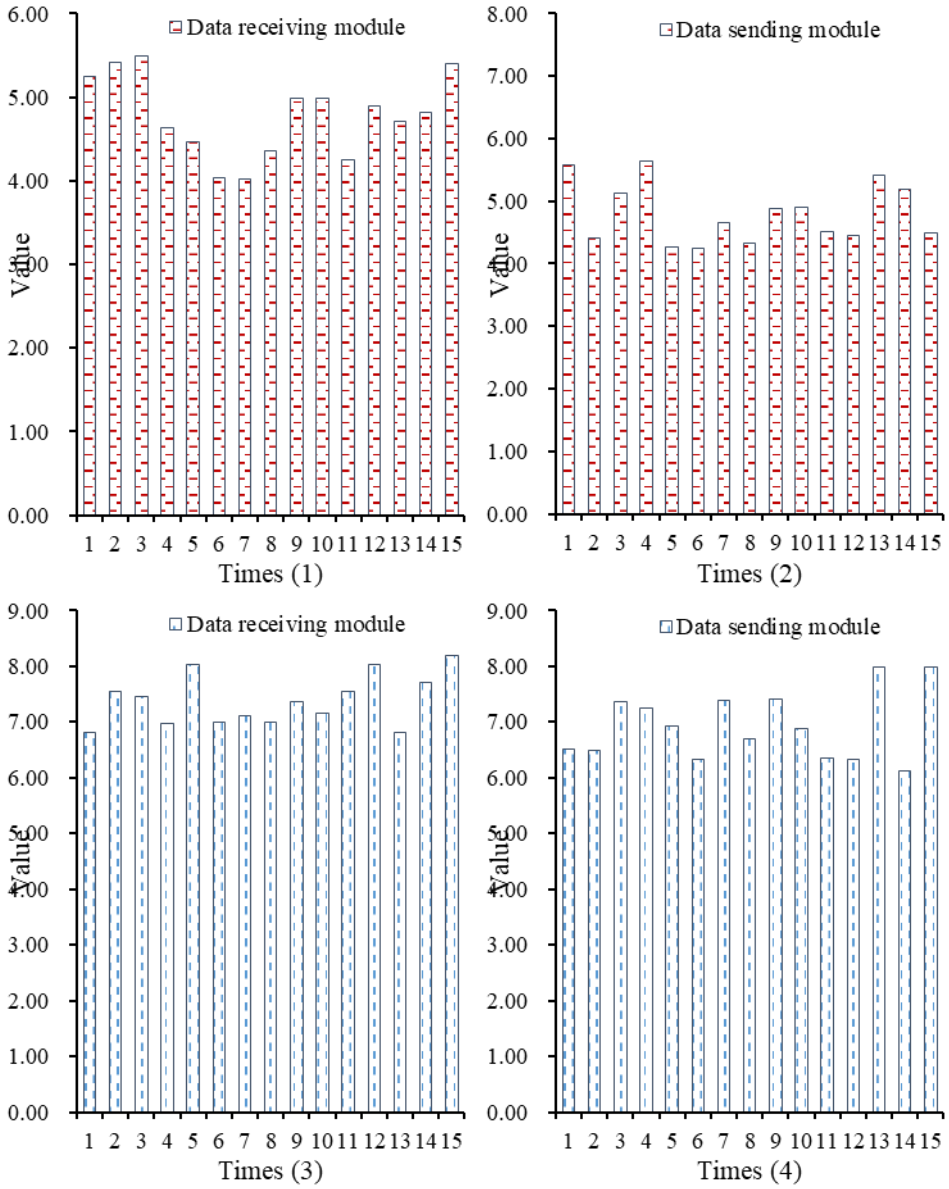

Figure 6. Data stability and reliability test during signal transmission

From the perspective of stability, before the addition of ferroelectric materials, the stability of the data receiving and sending module of the conventional electrical control system was at a relatively low level, and the maximum estimated value was 5.49. As for the reliability of the system involved in this research after the addition of ferroelectric materials, the test results are all greater than 6 and even reach 8.19 in the data receiving module. The research on the microstructure and performance of ferroelectric materials has attracted more and more attention. In the test, the microwave signal will be fed to the short wavelength of the wave direction. The exact location of the short circuit can be detected by a variety of methods, such as replacing the cable with a circuit and adjusting the power supply to output current.

4. Discussion

With the development of wireless network and sensor technology, people have put forward higher requirements for the living conditions of the home. Because the crystal orientation has a unique influence on the properties of ferroelectric materials, the preparation of ferroelectric materials with different crystal orientations, especially the low-dimensional structure, and the exploration of the physical mechanism affecting the orientation have become the main research directions. In addition to changing the physical properties of ferroelectric materials by applying traditional electric fields, external forces, etc., the properties of ferroelectric materials can also be improved by preparing preferentially oriented ferroelectric materials. The crystal orientation has a more obvious influence on the physical properties of low-dimensional ferroelectric materials such as ferroelectric thin films and ferroelectric nanowires. Because the ferroelectric nanomaterial itself has a certain inhibitory effect on the performance, if the surface charge of the material is not completely shielded, it will produce a depolarization field that inhibits the spontaneous polarization, thereby reducing the ferroelectric, dielectric, and electrothermal properties. Combining the characteristics of the smart home field, the conflict resolution and optimization strategy when activating and executing device control operations are calculated to avoid making the device in an unstable or uncertain state and reducing the workload of the device. The condition part of the rule is composed of a set of patterns, and the pattern is composed of a set of constraints. Pattern matching is actually a match between the pattern set of the rule condition part and the fact set. In a system with a large number of rules and facts, when facts are inserted, multiple rules may match successfully at the same time, and they form a set of conflicting rules.

5. Conclusion

The Internet of Things technology integrates sensor technology and wireless technology, which greatly broadens the application field of the Internet of Things technology, and smart homes have benefited a lot. Although the development of smart homes will encounter many problems, there is no doubt about the development prospects of smart homes. With the advent of the Internet of Things era, smart homes will slowly be recognized and loved like smart phones. Consider the transformation and development of traditional applications under the new network architecture, so that traditional applications can adapt to the new network architecture, and combine with the characteristics of the new architecture to provide better functional services, which has become a problem that needs to be solved when studying traditional applications under the new network architecture. Smart home also has broad economic prospects, it will lead computer technology, communication technology, etc., to merge into a more humane overall system. The computer combined with the power line network to control the home has solved some of the shortcomings of infrared transmission, which has an irreplaceable role in a certain period of time, but this fixed method cannot reflect the soul of the smart home and is free and convenient.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this

study.

Conflict of Interest

The author states that this article has no conflict of interest.

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