Research on New Energy Internet Socket and Power Management Platform System

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Abstract. Study the new energy internet socket and electricity management platform system. Develop and research new energy internet sockets, adopt new energy internet socket system, combine engineering product technology and energy management technology to realize intelligent energy management. Use self-service electricity management platform, adopt Internet of Things, cloud computing, big data technology to realize nationwide self-service electricity charging management model.

1. Introduction
At present, all kinds of electrical appliances use limited connections between plugs to obtain power. This traditional way of using electricity has certain limitations, resulting in a lack of power supply in some public areas. This is very inconvenient for everyone's life; at the same time, the traditional power supply model is adopted. In the public service process, the electricity charge management is only free, manual or coin-operated, which cannot meet the demand for electricity.

According to the current development status, to solve the key problem of charging service fees, from innovation, cross-border, new technology, the use of new technology integration, to provide new "self-service" services. Develop retail electricity in public places. It is difficult to use electricity in public places and lack electricity facilities. In cinemas, sports stadiums, hospitals, waiting halls, and airports, self-service barcode scanning equipment is used to design and research new energy Internet sockets and electricity management platform systems to solve the problem of intelligent electricity consumption.

2. New Energy Internet Socket System
The new energy Internet socket system is used to combine engineering product technology and energy management technology to achieve intelligent energy management. The system is shown in Figure 1.
The power management platform system is mainly supported by the following technical parts:

1. Remote control technology. The smart socket can control the switch of the power supply and indirectly control the commonly used household appliances, so that the household electrical appliances that do not have intelligent features become a semi-intelligent device.

2. Data communication technology. The smart socket can transfer the data collected from sensors and other devices to the internal embedded microcontroller, then to the cloud server, and send the data to the smart device client. The smart socket can also receive and execute data instructions sent from the smart device client and the cloud server.

3. Electric energy monitoring technology. The smart socket can monitor the current charge load through various sensors. At the same time, the smart socket system can also monitor, record, and analyze data such as current, voltage, power, or power consumption to provide users with electricity usage.

4. Timing and quantitative electric control technology. The smart socket can set the power supply time, and the power supply will be cut off as soon as the time expires.

5. Self-service electricity charging management technology. The user pays for the electricity cost by scanning the code on the mobile phone.

3. Energy Internet Outlet

The Internet socket is integrated by multi-part terminals such as electric energy metering chip, sensor module, data acquisition module, control module, etc. It is flexible and has many specifications. The Internet sockets of 10A and 16A are shown in Figure 2.

The new energy Internet socket uses peak-shaving and valley-filling, artificial intelligence algorithms to achieve orderly power consumption and virtual power plant functions. Internet sockets will accumulate big data during use, which is beneficial to the mining and utilization of "energy-using"
big data. During the use of the Internet socket, the temperature rise is automatically monitored to ensure the safety of electricity use. Its design satisfies the legal measurement requirements of electric energy, and the electricity management is fine.

Save labor costs, make equipment self-service intelligent, more automated power management, which can greatly reduce operation and maintenance personnel. Saving electricity expenditures, strict, precise and intelligent electricity management will effectively improve the power grid peak and valley filling effect, improve the level of power grid operation and maintenance management. Peak Valley adjusts the safe electricity consumption, the orderly electricity management of all-weather, all-network and all-coverage will greatly improve the safety coefficient of electricity consumption of the whole society.

New energy Internet sockets are standardized in size, compact, and convenient for manufacturing standardization, and are widely distributed in various public places. Users do not need to download APP, scan the code to use the new energy Internet socket to achieve energy sharing.

4. New Energy Internet Socket User Operating System Design

Scan through the browser to enter the new energy Internet socket shared electricity service platform. For the first login, please contact the shared electricity platform for after-sale request for user name and initial password. The Internet socket shared electricity service platform is a dedicated platform for agents, and manages all outlets and usage of agents. Allow agents to manage the next level of franchise stores. The user can enter the user name and password on the login interface to enter the platform.

Click the menu bar to select the "Second Generation Device" menu to enter the meter list of the self-service power management platform, as shown in Figure 3.

![Figure 3. Self-service electricity management platform meter list.](image)

The data list of available meters, such as ID, name, meter password, longitude, latitude, switch status, online status, and input time, will be displayed in the meter list of the power management platform.

Click the "Add Meter" button to enter the socket configuration page, the user can configure the socket according to the project description. The socket configuration interface of the self-service power management platform is shown in Figure 4.
The socket ID in the socket configuration interface refers to the 12-digit number on the socket. The name of the meter can be set according to user needs. The initial password of the meter is 000000. The latitude/longitude is determined by the specific location of the socket, so that it is easy to find the device. In addition, the charging method of each socket must be selected in the platform "payment method" to suit the scenario.

After the mobile phone is connected to the WiFi environment, open the APP, click the "+" sign, confirm the SSID input Password, then continue to press the button (>4S and <10S) on the socket to release, the blue indicator light flashes (1s on and 1s off) to enter the configuration Network mode. Among them, the WiFi used by the socket must be the same WiFi used by the mobile phone. Continue to press on the socket for about 5 seconds, then click the "confirm" button on the phone. The closer the socket is to the WiFi router, the easier it is to configure successfully.

The configuration is successful. When the blue indicator of the device is always on, the device is successfully connected to the network. At this time, the APP prompts that the addition is successful. Click "OK" to return to the device list page. If the blue indicator light is off, it means that the WiFi external network may not work. The schematic diagram of the smart socket connecting to the server is shown in Figure 5. The device access server details are shown in Figure 6.
The blue light is on, normal state. The blue light is off, there is a network signal. There is no connection to the server. The blue light flashes, there is no network signal, and there is no connection to the server. You need to reconfigure the network. Click the "Child Lock" button, other users will no longer be able to configure the socket, and generally complete the child lock after installation and configuration.

5. Conclusion
The new energy Internet socket takes the "smart city, inseparable from smart power" as its purpose, and uses the self-service electricity charging management model to build a new self-service mode by integrating the application of the Internet of Things, cloud platform, big data, and mobile payment technology. The retail service platform has built the metering function into the energy internet socket, and formulated various billing rules through the cloud platform to control the energy internet socket, successfully solving the problem of scattered electricity charges in public places. At the same time, the measurement control function of the intelligent socket is used to solve the problem of hidden safety during the charging process.

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