Research on low-voltage set-copy application compatible with wireless and carrier dual-mode communication

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Abstract: The development of smart grid is an important advancement in the development of China's power technology. The low-voltage set-copy application compatible with wireless and carrier dual-mode communication relies on the powerful background of the smart grid to realize the application development of communication technology. The power line carrier super application has many advantages, and there are some drawbacks in some aspects. In current smart grid applications, a convergence of multiple technologies is also required. This paper takes the low-voltage meter reading application compatible with wireless and carrier dual-mode communication as the research object, analyzes the use mode of power line carrier in low-voltage collection system, and clarifies the solution of dual-mode communication technology, using data analysis method. It is clear that the problem of meter reading is solved by the two-channel traffic scheme, but the main method provides theoretical and technical solutions for the low-pressure collection work.

1. Introduction

Financial wireless and carrier dual-mode communication technology is a communication technology for implementing data transmission, mainly for transmitting information data through low-frequency signals or high-frequency signals. Communication technology is mainly used for transmission between high voltage transmission lines, medium voltage distribution lines, low voltage power supply lines and low voltage users. The low-voltage power collection system uses the low-voltage power supply line for data acquisition. The construction of smart grids in China is gradually developing. Low-voltage collection is a complicated and specific work. When grid companies increase the construction of centralized meter reading systems, they will usher in a new development opportunity for low-voltage power carrier communication industry. In the development and construction of China's smart grid, the collection and copying system needs to be continuously constructed. The computer environment in China is complicated, and there are many interference problems in the low-voltage collection. Environmental and technical deficiencies can lead to blind spots on meter reading. The low-voltage meter reading technology that uses wireless and carrier dual-mode communication is to solve the drawbacks of the carrier meter reading device.

2. The main characteristics of compatible wireless and carrier dual-mode communication

2.1 It can effectively realize the spread spectrum communication method

In the field of automatic meter reading in China, low-voltage carrier communication is a commonly used technology. The grid company collects the information of the store and realizes the spread spectrum communication mode through the low-voltage carrier communication. The low-pressure collection development technology is relatively mature, and it is cost-effective in practical applications. In the process of collecting electricity consumption information, it can meet the needs of various occasions, especially in the case of user dispersion, which can reduce the cost and make maintenance more convenient. The low-voltage carrier technology is a more advanced broadband communication, which can provide real-time communication data, especially for dynamic networking, and can improve broadband communication through low-voltage carrier

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technology. In the current development of smart grid, traditional spread spectrum technology is difficult to overcome the long-distance data transmission due to various restrictions. Compatible wireless and carrier dual-mode communication can make up for the lack of data due to the long distance [1]. Compatible with wireless and carrier dual-mode communication, it can greatly improve the transmission distance and achieve the accuracy of data transmission.

2.2 Being able to effectively guarantee the reliability of data transmission

In the different operating areas of the smart grid, there are different interference problems. Signals are weak, and noise interference caused by narrowband will form interference to the signal. Sometimes when reading, it is impossible to correctly identify the authenticity of the data [2]. The reliability of data transmission can be effectively guaranteed by a low-voltage set-copy application compatible with wireless and carrier duplex communication. Because the dual-mode communication technology is on the same communication module, realizing power carrier communication and micro-power wireless communication, it is a main communication communication mode based on carrier communication, to make up for the advantages and disadvantages between the two. This method of collecting and copying can gradually improve the success rate of the collection, and can achieve a 100% success rate in the mature stage. The advantage of power line carrier and micro power wireless is that two communication channels are integrated together, and a dual-mode communication module is established through wireless communication technology and carrier communication technology, and two channels are independent of each other, and simultaneously transmit and receive, micro-power wireless communication. Technology and power carrier communication technology can fully improve the reliability of traffic efficiency.

2.3 The path to optimize the operating environment

The low-voltage collection system for wireless and carrier dual-mode communication uses two different communication methods to enhance the transmission characteristics and transmission distance advantages, and can maximize the use of network resources and improve the parallelism of network operation. These two relatively independent Two different tasks are implemented on the channel [3]. This approach optimizes the path to the operating environment. That is to say, the two meter reading technology realizes the use of carrier communication and micro-power wireless communication on the same communication module, and adopts the dual-mode module for data set copying, and does not need to perform any operation and modification when applied in the field, and The cost of use is low. In the systematic construction, the modules of the entire station area can be replaced with dual-mode modules.

3. The application of low-voltage meter reading for wireless and carrier dual-mode communication

3.1 Full carrier application mode

The application of the full-carrier mode is mainly composed of a carrier energy meter and a concentrator. Within the power supply range of the transformer, the carrier energy meter and the station concentrator perform data acquisition through the low-voltage carrier mode, and a dedicated communication line can be used without Change the network topology. This method is mainly suitable for mountain areas where electricity meters are scattered and where construction is difficult. In the process of using the system, the whole system adopts carrier communication to maintain the balance between the energy meter and the energy meter without additional communication lines. The concentrator establishes a complete path relationship with the carrier energy meter such as the area of the station through the route automatic networking mode, and through the data command of the concentrator to read the electric meter, according to various previous path designs, the data of the electric energy meter An automatic operation flow is formed, and communication is performed according to a predetermined route according to an operation command of the main site.

3.2 Half carrier application mode

The application method of the half carrier requires additional lines to be connected in the process of data collection. This method is used for centralized meter boxes or newly built cells or normative cells. Operation is carried out by a carrier collector, a concentrator, and a 485 energy meter [4]. The concentrator establishes a complete path relationship with the electric energy meter in the station through the automatic route networking mode, and collects the relevant data of the electric energy meter according to the command of periodically starting the meter reading electric meter, and performs communication, data and data through the carrier collector. The transmission between the two will form a closed effect, the system will respond to the point copy command first, and realize the real-time control of the data collection according to the actual situation. The application method of the half-carrier can effectively reflect the accuracy of the data, and can have a clear judgment on the over-range and all the data communication through the specified electric energy meter.

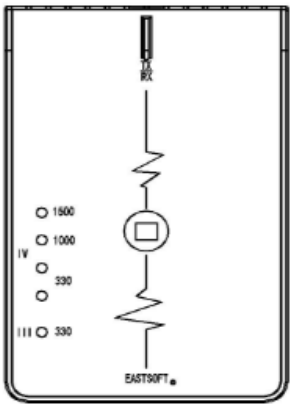

Figure 1 carrier power

3.3 Mixed use

The use of the hybrid mode mainly means that the carrier energy meter communicates with the concentrator through the carrier mode, and the other part of the energy meter communicates with the concentrator through the carrier collector mode. The mixed use method is mainly based on the actual situation of the site, using an exciting way. The advantage of the hybrid approach is that it is flexible in application. In the full-load and half-load mode areas, or in areas with difficult construction, or in more complex environments, the mixed use method can effectively solve the management aspect. The problem. Especially in the process of the transformation of the Taiwan area, through the wireless and carrier dual-mode communication, the accuracy of the low-pressure set-up work can be realized, and the related problems can be solved from the perspective of technology advancement [5]. In China's current smart grid construction, hybrid applications have gradually become a common way. By means of mixed operation, the scheme of low-pressure collection can be determined in a short time, and the method of low-pressure collection and copying can be involved at any time according to changes in the environment.

4. Conclusion

Compatible wireless and carrier dual-mode communication can fully solve the problem of carrier low-voltage splicing. By eliminating the need to create additional zoning, it is only necessary to replace the module to solve many problems. The dual-mode meter reading adopts the dual-channel communication technology, which takes advantage of the respective systems. In the installation, commissioning maintenance and power line carrier meter reading system, the accuracy of data transmission can be realized, and the blind spot and coverage problems can be solved. Low-voltage set-copy requires the authenticity and stability of the data, so the choice of which integrated technology is applied is crucial for the smart grid. Low-voltage set-up requires further advancement in technology to adapt to the needs of the current smart grid. In the development and construction of smart grids, there are clear requirements for the development of various technologies. Only by

ensuring the innovative application of technology can the accuracy of data transmission be realized, and the coordination of hardware and software equipment in the construction process can be ensured.

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