

Development of control system of magnetotelluric instrument based on cloud platform

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SUMMARY

MT is one of the most mainstream geophysical methods, which has been widely used in the fields of mineral resources exploration, energy exploration, and tectonic research. In this study, a set of front-end and back-end separated MT instrument acquisition and control system is designed by integrating Mybatis and Socket framework based on Spring Boot, and combining web development and Android development.

The acquisition control system of MT instrument adopts the operation mode of instrument-cloud platform-terminal. After powering on the MT instrument, the instrument takes the initiative to initiate a long-time socket connection with the cloud server, and the server obtains the basic information, file information and other relevant parameters from the instrument at regular intervals and updates the data collected in the instrument in real time, so as to achieve the transmission of the data collected at the same time and effectively improve the work efficiency in the field. This can effectively improve the efficiency of field work. At present, the cloud server has the following functions: obtaining the basic information of the instrument in real time, viewing the measuring points on the big data map, obtaining the file information of the instrument in real time, updating the data files collected by the instrument in real time, sending MT acquisition control commands according to the instructions of the terminal, and providing data download service for users. The management and access of the cloud server adopts the website mode, and users can access the cloud server through different terminals. At present, the web terminal provides user login and data download service, and the Android mobile terminal develops the instrument basic information display, online and offline reminder, and acquisition control function, which is still in the process of further development and testing. In this study, the parts of this acquisition control system were tested in BGP Base in Bazhou, Hebei Province. Three measurement points with high, medium and low noise interference levels were selected for experimental comparison and the results were analyzed. The test shows that the functional modules of the MT instrument are normal and effective. The MT instrument acquisition control system can correctly establish the long-time connection communication with the instrument and carry out command control and data transmission, and can normally realize the functions of instrument information acquisition, acquisition parameter configuration, real-time data update, etc. Meanwhile, the web page side can also correctly access the data download page, so that the user can view the data and choose to download it at any time.

The MT instrument acquisition and control system designed by us realizes the function of field data transmission as it is acquired and allows multiple accesses to view the data through different terminals, which is convenient for field production and improves work efficiency. In the test, the system performs stably and can collect uninterruptedly for more than 24 hours, which has strong practical application value.

Keywords: MT, Cloud Platform, Acquisition Control System
