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Digital Data Acquisition Systems for Data Capturing of Geophysical Information: Methods for Testing Performance in the Field

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Today, almost all geophysical research is carried out in digital format. For this, various digital data acquisition systems (DDAS) are used. The basis of any information DDAS is analog-to-digital converters (ADCs), which can be implemented both in the form of microcircuits and in the form of independent electronic units or boards.

Unfortunately, during fieldwork, personnel rarely pay attention to monitoring the correct operation of the ADCs used and promptly assessing the quality of their work. This issue becomes especially relevant when carrying out work far from civilization, where it is not possible to use expensive and complex service equipment.

Article [1] offers simple ways to test the performance of almost any ADC or DDAS. There is shown how, using the simplest equipment and instruments, you can make an initial assessment and check of almost any DDAS.

For example, for a three-component DDAS, by conducting just three independent tests (changing the input signals at each input in turn), it is possible to identify both the values of the critical parameters of the ADC and their possible main faults.

As a test signal generator, it is proposed to use a simple Wien generator circuit, which can generate a harmonic signal that is asymmetrical regarding zero (ground).

Thus, with just a simple set of tools, anyone can quickly evaluate and test almost any DDAS, determine the correctness of analog-to-digital conversion and display of input voltages, as well as the levels of inter-channel penetrations and even self-noise of the acquisition systems [1].

Reference

[1] *Gravirov V.V.* Nauka i Tekhnologicheskie razrabotki (Science and Technological Developments), 2024, vol. 103, no. 1, pp. 3–37. [in Russian]. https://doi.org/10.21455/std2024.1-1