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Three-phase power network analyzer n-43 for PXIe NI for Slow Control System of MPD-NICA

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It is very important to properly supply the electronic circuits; therefore, in the Polish Group of Experts at ZIBJ in Dubna, we devote major attention to the whole project of the Slow Control System. The sophisticated measurement system of the MPD-NICA experiment generates a lot of electrical impulses that interfere with sensitive electronics and may disrupt proper operation of the system.

The reduction of such interference in filtering systems will be much more effective if the power supply is properly designed from the first power supply circuit. An elementary condition that must be met is to ensure that loads of electrical phases are properly balanced. The principle is to minimize the current in the neutral wire. In this case, current flowing through one phase is equal to the amount of current flowing through the other phases and neutral current is close to zero. The second support condition is the zero current in the PE conductor (ground).

Presented project is an attempt to solve this problem. The designed analyzer measures the load on each phase. The collected data allow estimating the load during balancing process, both on the scale of one RACK and on the whole system. Another advantage of this approach is the ability to provide continuity of power for important experiments by monitoring power lines for energy reserves by switching the appropriate circuits.

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