Materials of Conferences

NECESSITY OF DEVELOPMENT OF METHODS AND DEVICES OF INCREASE THE ACCURACY OF ANALOG-DIGITAL TRANSFORMATION PROCESS

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Today digital processing of signals is impossible without preliminary analog-digital transformation. Analog-digital converters (ADC) provide direct communication and transfer of the measuring analog information from object of measurements in the computing or managing digital device. Thus, reliability of the information about meanings measuring of sizes, and, therefore, productivity of the decisions, accepted on their basis, or quality of management of processes, are defined by accuracy used ADC. From here follows the importance of study of the reasons influencing accuracy of transformation, and also realization of researches directed on increase to accuracy of transformation.

In practice for the decision of a task of increase the accuracy of process of analog-digital transformation, use only precision ADC, in perfection and which creation the modern firms - developers of electronic components are engaged. However, it completely does not decide the put task for several reasons. First, high accuracy of the characteristic ADC yet are not a guarantee that in conditions of influence external damage of the factors, at which equipment given ADC all also usually works will be exact. Secondly, the process of analog-digital transformation is complex and provides besides the basic operation of analog-digital transformation which is carried out ADC, also performance of a number of necessary accompanying operations substantially determining accuracy of transformation in whole. It is operations previous to analog-digital transformation: samples and storages of entrance signals ADC, formation of absolute meaning of entrance bipolar signals ADC; and subsequent operation of correction of errors ADC.

However, neither in the technical literature, nor among the developers, to these operations (subsystems) is not given of sufficient attention. This testifies to necessity of realization of additional researches for this area. Therefore on our sight, the task of increase of accuracy of process of analog-digital transformation should be reduced not only to perfection of integrated microcircuits which are carrying out transformation, but also to complex increase of accuracy of process of analog-digital transformation, in view of subsystems, included in him. We are engaged with development of methods and devices of their realization directed on increase to accuracy of operations of analog-digital transformation.

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THE ANALYSIS AND SYNTHESIS OF OPTIMUM STRUCTURES OF ANALOG-DIGITAL AND DIGITAL-TO-ANALOG TRANSFORMATION OF SYSTEMS OF AUTOMATIC CONTROL

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Modern discrete systems of automatic control (regulation) contains in the structure both digital (discrete). and analog (continuous) parts. For the coordination of these parts in system are used analog-digital (ADC) and digital-to-analog converters (DAC). Them metrology characteristic (first of all, accuracy) play the important role in maintenance of quality of realization measuring, managing functions of systems of automatic control and their serviceability.

Therefore our scientific research is directed on the analysis of the reasons. lowering accuracy of transformation, and development the possible ways of reduction of their influence. And then - on the decision optimum of a task and development of the recommendations on construction of effective structures of input-output of the information in systems of automatic control. With this purpose the following research problems were put:

1. Development the methods of increase the accuracy of a subsystem (process) of analog-digital transformation. The given task already is decided by development of ways of improvement of the characteristics of devices the sample and storage of entrance signals АЦП; development of a method of formation of absolute meaning(importance) of entrance bipolar signals ADC; perfection of methods of correction the errors ADC; theoretical and experimental researches of the offered technical decisions on perfection of process of analog-digital transformation.

2. Development the methods of increase the efficiency of a subsystem of formation the supporting voltage for ADC and DAC on the basis of development the methods of formation the supporting voltage and technical decisions precision, thermo-constant and not much noise the sources of a supporting voltage.

3. Development the methods of increase the accuracy of a subsystem (process) of digital-to-analog transformation.

4. Synthesis of optimum structures of input-output of the information in systems of automatic control on the basis of development the method of structural - parametrical synthesis of complex system and decision optimum of a task.