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System process management with implementing of diagnostics and service functions

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Introduction. We consider approaches to develop a framework for application software programmable logic controllers as components of the base system process control (BPCS) with regard to their integration with other systems (SCADA, SIS, BPCS, MES / MOM) and increased requirements to the diagnostic process and service process and equipment.

Materials and methods. The concept of software framework designed for controllers of PAC (Process automation controller), is based on open standards IEC 61131 and is not used for producing specific solutions. The structure and the internal implementation of library elements frame ideas are based on ISA-88, ISA-95, ISA-106 (Draft) which provide the simplest integration of control systems into a single integrated automated control system. The principles that are enshrined in the ISA-95 standards consider to be the most well developed and proved mechanisms of integration for today. Levels of software and hardware are required to implement the ideas laid in the basis of the above standards.

Results and discussion. The paper proposed mechanisms improve the diagnosis process and the system, quickly setting up the system and restore its functionality after failures. The frame is a set of interrelated elements of library functions and function blocks, which are described at their interface, interaction principles and algorithms of functioning.

Developed concept is based on the implementation of the object model of equipment in PLC, according to the concepts of ISA-88, ISA-95 and ISA-106. Each hardware object (Equipment Entity) is a functional block or function, and a set of data that can realize the exchange with the upper level. The data structure and behavior of the function/functional block compatible defined in ISA-88 is based on machines states, modes and interfaces defined in this standard. The procedural elements and basic control are also based on standard terms.

Conclusions. It is assumed that the implementation framework for the particular controller to be used languages IEC 61131-3, but not a prerequisite. Set the frame elements can be expanded and supplemented with additional functionality without infringing the general principles.