# DEVELOPMENT OF AN OPENNESS PROFILE FOR A LOGICAL CONTROL SYSTEM FOR TECHNOLOGICAL EQUIPMENT

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**Annotation :** *The current stage of development of society is classified as post-industrial, the basis of which is information as a means and object of production. Under these conditions, the means of collecting, processing and transmitting information have changed: an increasing number of people use mobile devices to work with information resources, and the global network and cloud technologies are used to access large amounts of data. These changes are also reflected in industrial technologies, which have moved from a concept focused on the automation of individual machines and processes to a concept that involves the digital representation of all physical assets, and then integration into a digital global system built together with partners participating in the value chain.*

**Keywords:** *Subsets, scalability, functional extensibility, application portability, physical communication protocols, systems security, task management, programming languages and standards.*

An openness profile is a selection of a set of basic standards with a focus on their harmonized subsets, designed to design specific modules, functions, or a subset of software system functions within a specific functional environment. The functional model, the development process of which is presented , is 93 the basis for the formation and further use of the openness profile. When designing an integral control system and choosing software, hardware and communication tools from various manufacturers that will be built into the designed system, it is necessary to take into account their compliance with the openness profile, i.e. track their performance within the selected harmonized standards. In this case, all components of the control system will operate in a single environment, and the following system properties will be ensured: scalability, functional extensibility and application portability. The openness profile of the control system consists of a set of standards that must be consistent with each other and cover the interaction of software and hardware components of the system. In addition, the openness profile should define the specification of the protocols and interaction interfaces that make up the structure of the control system. When building an openness profile, it is necessary to use a multi-level model of the control system by the type of virtual machine, on the basis of which it is necessary to determine the rules for interaction between levels. At each level, types of functional components are distinguished in accordance with the model of open systems that interact with each other. Among the main types of functional components, the following are distinguished: external and internal interfaces of the system (including interfaces for interacting with users), programming

languages and standards, task management, data management, physical communication protocols, system and data security, etc. [1]

The restrictions set by the basic standards and regulatory documents of the profile, and the harmonization carried out at the design stage of the profile, should ensure the appropriate quality, compatibility and correct operation of the components within a single control system. When designing a control system, the selected standards are applied as a regulatory framework.

•The following can be distinguished as goals for the development and application of openness profiles:

•increased connectivity and reduced costs for the development of control systems;

•ensuring the portability of application components of control systems;

•designing opportunities for functionality extensibility and scalability

•individual components and control systems as a whole;

•designing the possibilities of functional integration into the task management system,

•which were previously solved separately, with an increase in the efficiency of solving these problems;

•improving the quality of performance and reliability of individual modules of control systems.

The choice of standards and regulatory documents in the formation of an openness profile is carried out depending on the priority among the listed goals. The methodology for constructing management systems openness profiles can be the 1st and 2nd parts of GOST R ISO / IEC TO 10000-1-99, which define the foundations and taxonomy of information systems openness profiles.

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International commissions for standardization and certification allow the use of only international, regional and national standards as documents included in the openness profile, and the use of de facto standards and technical documents of individual firms is not allowed. This approach does not imply the possibility of unification and parameterized use of functions and modules of modern control systems. In this regard, most developers of control systems when building profiles use, in addition to basic international and national standards, also open widely used specifications of de facto standards and advisory documents of international consortiums.

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