



APPLICATION OF THE EXPERION SYSTEM IN THE DEVELOPMENT OF PROCESS CONTROL SYSTEMS

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ABSTRACT

The software covers various aspects of control, management, diagnostics, analysis, documentation and advanced management and contains a number of original algorithms based on the study of specific properties of the automated object.

KEYWORD: *management, Experion PKS, an application program, a graphical Configurator, the algorithm of the model function.*

DISCUSSION

Experion PKS system software covers various aspects of control, management, diagnostics, analysis, documentation and advanced management and contains a number of original algorithms based on the study of specific properties of the automated object.

Control Execution Environment (CEE) software environment.

The general CEE software environment for the execution of monitoring and control algorithms covers 3 technical means:

- Controller C200, which implements typical functions of monitoring and control of the lower level;
- Experion PKS server, which implements more complex and voluminous (supervisory) control applications, the output of which is to influence the setpoints of the lower-level control loops or direct commands to the actuators;
- a personal computer that simulates the operation of the controller and the server (without connecting the latter to a computer), which is necessary for checking and debugging the developed application control and management software and for training and training operators. Simulation of the automated process itself (if required) is performed by a special software package Shadow Plant Honeywell. When debugging

the software, the computer that implements the simulation is connected to the existing Experion PKS system and reads data from the controller working in it (naturally, without control actions).

For the operation of the same application programs on different hardware, certain software functions are added to the general software environment, therefore, specific software environments are divided into a control solution environment for a controller, an application management environment for a server, and a simulation control environment for a computer that implements the model. The control decision environment of the controller operates in 2 performance options: with a basic processing time of one functional module of 5 and 50 ms. At 50 ms, the execution period of individual software modules can be 50, 100, 200, 1000, 2000 ms, and with a fast cycle of 5 ms, the execution period of individual software modules can be 5, 10, 20, 100, 200 ms.

Programming control and management tasks. The tool for programming monitoring and control tasks in all three software environments is the Control Builder n graphical configurator, based on an extensive library of typical algorithms of mathematical, logical,



management functions, which are grouped into control, regulation, and sequential control modules.

The library of standard software gram modules include:

- general mathematical operations such as linearization, lead / lag, time dead zone;
- logical operations and functions of sequential control of mechanisms. In separate software modules for controlling a group of mechanisms, various options for actions in the event of emergency situations in the process of sequential actions are implemented, which prevent the possibility of emergency events. There are also modules that provide interactive interaction of automatic and manual actions in the process of sequential control of mechanisms;
- control programs, including typical PID algorithms, PID feedforward , cascade control, ratio control.

In addition, the library includes a number of special modules, in particular, interfaces with drives of the Allen Bradley family, calculations of the flow rates of various gases taking into account the ambient temperature, pressure and gas composition.

The Control Builder is used to design, document and monitor the control and management algorithms. It supports hierarchical nesting of some software modules into others; allows you to copy and use the designed modules many times; implements multi-user design, when several users configure and download programs from different workstations. User application programs can be written in C / C ++, Visual Basic, Visual C / C ++ and implemented on the server, workstations and controllers.

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