AUTOMATED CONTROL SYSTEMS FOR TECHNOLOGICAL PROCESSES AND MOVABLE OBJECTS

HOW TO CHOOSE A PROGRAMMABLE LOGIC CONTROLLER FOR THE INDUSTRIAL TIRES

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Programmable logic controller (PLC) is a special type of electronic computer. Most often, PLCs are used to automate technological processes. The main mode of operation of the PLC is its long-term autonomous use, often in adverse environmental conditions, without serious maintenance and practically without human intervention [1].

PLCs have a number of features that distinguish them from other electronic devices used in industry:

- Unlike a microcontroller (single-chip computer) - a microcircuit designed to control electronic devices - PLCs are an independent device, and not a separate microcircuit.
- unlike computers, which are focused on decision making and operator control, PLCs are focused on working with machines through advanced input of sensor signals and output of signals to actuators;
- unlike embedded systems, PLCs are manufactured as independent products, separate from the equipment controlled by it [2].

When choosing a controller configuration, you must first of all clearly understand the essence of the technological process. Based on the results of the analysis, a work algorithm is drawn up, which is necessary to perform all the necessary operations. Next, a list of discrete sensors and controls (buttons, switches) is formed, which will be needed to receive information by the controller. Based on this, the number of PLC digital inputs is determined. If necessary, add-on modules are purchased additionally.

Next, you need to determine the number of controller outputs. The outputs control the power supply of various drives (starter coils and relays), pneumatic and hydraulic valves, starting of frequency converters.

An important part of the controller is the analog modules needed to process signals from analog sensors and potentiometers. The analog output signals can also be used to control the speed of motors (via a frequency converter) and various drives such as electro-pneumatic converters.

Note that it is important to have access to the PLC control program to diagnose and change the operating algorithm. However, most manufacturers block this access using passwords and other security methods. This should be taken into account when

purchasing equipment and discussed with the manufacturer at this point. Alternatively, when using the Internet access module, it is possible to connect to the controller and correct the program from anywhere in the world [3].

Data processing. Modern controllers with advanced programming based on tag names (characteristics) have various processing capabilities, including built-in registration. Some advanced controllers can also interact with standard databases in enterprise-level systems, such as enterprise resource planning (ERP) systems. Writing data directly to a memory device in the form of a USB flash drive connected to the controller is also an important feature, often required for a variety of applications. Controllers with data logging functionality often support a formatted USB stick or microSD card, which has up to 32GB of storage.

Communication capabilities. Another important feature to consider when choosing an automation controller is the connectivity, or, as we say, the connectivity. Multiple Ethernet and serial ports must be available here to allow easy integration with Human Machine Interfaces (HMIs), motor drives and other devices.

High-speed traffic control. The features of choosing a modern controller include the ability to control motion and other high-speed applications. These functions require high-speed I / O, as well as a powerful enough processor and the ability to prioritize these high-speed tasks.

When choosing PLC controllers, users need to think beyond the basic control requirements and the number of I / O ports available. In many applications, controllers also require extensive data logging and communication capabilities to control high-speed applications such as coordinated motion.

Reference:
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