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COMPUTER-INTEGRATED SYSTEMS FOR THE ENERGY CARRIERS METERING

The rapid development of information technology facilitates the creation of computer-integrated systems and their implementation in many areas of human activity, from household organization to industrial production.

Typically, such systems have three-level architecture. The first level of such a structure contains sensors and actuators, the second level handles event processing (where information is stored and processed, and devices of the previous level are controlled), and the third level handles monitoring and remote control using the Internet [1].

The use of such systems allows for the collection, transmission, processing and analysis of data received from primary transducers. This, in turn, facilitates the acquisition of prompt and reliable information about the state of the controlled object or technological process, the adoption of optimal decisions, especially in the event of emergency situations, and increased management efficiency.

In this case, the controlled object may be a separate apartment in the living building, a private house, a public building, a microdistrict, an industrial enterprise, etc.

In particular, such systems are becoming widespread in the field of monitoring and controlling indoor microclimate parameters (temperature, humidity); lighting, including street lighting; power supply for electrical equipment; monitoring technological process parameters (temperature, pipeline pressure and its tightness), etc.

The applied data transmission technologies and the topology of the created systems are selected depending on the size of the control object, the number, purpose and location features of the primary transducers.

In the field of energy carriers metering, characterized by a large number of simultaneously connected remote devices, the most widely used wired and wireless technologies are RS-485, M-Bus, wM-Bus, LoRaWAN, NB-IoT [2, 3].

The specific features of the metering systems using at industrial enterprises include the need to integrate legacy equipment into a network that does not have wireless data transfer interface adapters, as well as the installation of sensors and actuators in hard-to-reach places.

In this case, a combined system is used, where wired data transmission technologies are used at the first level.

As a result, such system offers the advantages of all currently used data transmission technologies, namely [2 – 4]:

– High noise immunity and data security (accessing information requires physical access to the equipment or data buses);
– High reliability;
– Weather-independence;
– The ability to combine meters from different manufacturers in the network to measure different energy sources;
– Unlimited quantity of connected metering units;
– Speed and ease of deployment;
– Significant reduction in time and cost during the design, deployment, and operation of the system.

At the same time, issues of software vulnerabilities, information system leaks, vulnerability to cyber attacks, etc. remain relevant.

Practical issues of creating computer-integrated energy carriers metering systems in our country are presented in the report.

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