ABSTRACT

Relevance of the Topic - Currently, the majority of companies employ high-tech information equipment to support their operations. To ensure the reliable functioning and uninterrupted operation of such information systems, it is necessary to utilize specialized server rooms housing telecommunication equipment.

The reliability and efficiency of these server rooms are directly linked to the conditions of their operation, particularly the microclimate. In this context, it becomes crucial to consider integrated climate control systems that provide optimal conditions for the reliability and efficiency of equipment utilization.

The development of information technologies and the application of IoT technologies enable the modification and improvement of climate parameter control systems, aiming to reduce their cost, expand functional capabilities, and enhance accuracy and speed.

In this master's dissertation, an automated system based on the Arduino UNO platform and DHT11 sensor has been developed for continuous monitoring and data transmission regarding changes in climatic conditions within a server room. This system allows the integration of various sensors (smoke, dust, fire, etc.), significantly expanding its functional capabilities. The system records parameters subject to mandatory control, processes them, and transmits the data to a server for further storage. To address this objective, a website for the automated system has been developed, providing real-time tracking of changes in the server room's microclimate.

The designed climate parameter monitoring system determines the levels of humidity and air temperature in the server room. If necessary, it automatically takes measures to return controlled parameters to normal ranges. The system is capable of alerting owners in case of emergencies in the monitored premises and is designed for continuous 24/7 operation.

Research Objectives and Tasks - The research aim is the automation of remote control over the microclimate parameters of a server room through real-time monitoring to ensure their optimal values. To achieve these goals, the following tasks were addressed:

1) Examination of requirements for microclimate parameters in the server room.

2) Review of existing analogs.

3) Development of the system's structural scheme.

4) Prototyping of the automated system.

5) Development and optimization of algorithms for processing and transmitting informational data.

6) Creation of a website for the automated system.

7) Economic component calculation.

Research Object - The process of monitoring microclimate parameters in a server room.

Research Subject - The automated system for controlling server room microclimate parameters.

Research Methods - To address the set tasks, modeling and programming methods were employed, along with principles of automatic control theory, methods for creating automated microprocessor measurement systems, and statistical and experimental data processing methods.

Scientific Novelty of Obtained Results:

1) Improvement of the server room microclimate parameter control system through the use of systemic solutions for monitoring, storage, analysis, and processing of collected data.

Practical Significance of Dissertation Results:

1) Implementation of an automated system for monitoring server room air parameters.

Keywords: Server room, microclimate, Arduino UNO, microprocessor system.