HARDWARE AND SOFTWARE INTERFACING OF THE ELEMENTS OF THE AUTOMATED CONTROL SYSTEM

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The technical support for the exchange of information between the elements of the automated control system (ACS) is carried out using the information transmission system (ITS).

The source of information transmits messages to the communication channel, which consists of: a transmitting device, a communication line and a receiving device.

The task of the transmitting device is to convert messages into signals that must pass through both wired and radio channels. The signals are received by the receiving device, which reproduces the transmitted message and delivers it to the recipient. The technical capabilities of the communication channel and the principles of its construction depend heavily on the purpose of the ITS and on the characteristics of the source and recipient of the information.

In the ACS, the main means of information processing are electronic computers (computers). The use of modern communication systems in the ACS that would ensure the exchange of information between computers and control points (CPs) is very necessary. Such systems are called data communication systems (DCS).

The purpose of the report is to present scientific material on the hardware and software interfacing of the elements of an automated control system.

The report presents the results of the study of mathematical and software of the ACS functioning, as well as the purpose and main characteristics of the special purpose data transmission equipment (DTE) AI-011. A universal coupling device (UCD) of the AI-011 SP DTE with a personal computer is proposed. The schematic electrical diagram of the UCD and the block diagram for combining the elements of`the ACS are presented. The essence of the UCD operation according to these schemes is revealed. The special software of the ACS is presented, which implements the algorithm for converting codagrams from the format of information exchange in the DTE SP AI-011 in simplex, half-duplex and duplex modes of operation to the format of the RS-232 interface of the serial COM port (USB) of a PC and vice versa.

References

1. Kolomiitsev O. V. Universal device for conjugation special purpose data transmission equipment with a personal electronic computing machine / O. V. Kolomiitsev, I. S. Rudakov // Проблеми інформатики та моделювання (ПІМ–2022) : тези 22-ї міжнар. наук.-техн. конф., Харків – Одеса, 09-14 листопада 2022 р. / наук. ред. В. Д. Дмитрієнко ; Нац. акад. наук України [та ін.]. – Харків : Контраст, 2022. – С. 52. URI: https://repository.kpi.kharkov.ua/handle/KhPI-Press/60044.