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APPLICATION OF “FSM IN A BLACK BOX” METHOD IN REMOTE STUDYING

Remote studying, as a form of engineering education, tends to expand the scope of use. Objects and aspects of remote studying are constantly becoming more and more complex. One such object is the logical control system, which is studied using the Finite state machine (FSM) function set. The experimental part of the relevant training courses includes the study of technologies for the synthesis of structures of such systems. The training practice revealed problems for students in developing the FSM as logical control systems with new non-template functions. For practice, solving such problems, you can use the method "FSM in a Black Box"

The essence of the method is to describe the properties of some essence (object or process) on the basis of the assumption that it is a system with inputs, outputs and states. Properties of this system are described through the interconnection between inputs and outputs. Aspects of system implementation, composition and connections between internal elements and states are not investigated.

The version of this experiment for use in the remote lab of GOLDi was designed and implemented at the Technical University of Ilmenau within the Erasmus + KA1 program. During the experiment, the student sees only signals from inputs, outputs and states that are displayed by changing the color of the indicator. Watching the movement of the virtual physical system, the student

makes a conclusion about which indicator corresponds to which signal. When a student is sure of the final conclusions, he can enter answers using the drop-down lists. After that the result of the experiment is checked by the program for correctness. Also a method for preventing cheating was created using Fisher-Yates shuffle method. Due to this method, at the beginning of the experiment, the row of indicators is placed in random order. Thus, for each subsequent experiment, the correct answer will be unique, and it will not allow students to cheat using the other students' answer as their own.