Universal Multi-functional Module for Digital Electronics

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Few years ago we discovered “snap circuits” type of electronic constructor. But, unfortunately, those constructors didn't provide varied elements necessary for advanced tasks in digital electronic. Such obstacle bring on the idea to create a Universal Module. Universal Module we call the multi-functional constructor module which can simulate almost any digital electronic element. For ex., one module can be used as multiple logical gate, binary counter, binary adder unit, flip-flops, register... This Universal Module was created on the basis of Microcontroller. We modified one of the existing constructor component. The modification implied to: drawing the electric scheme, producing the PCB based on it, also we have added LEDs for visualization of digital signals. We wrote software for the Microcontroller; this program allowed us to simulate almost all kinds of digital electronic elements, so we keep simplicity of constructor, and receive opportunity to deal with interesting and complicated tasks in digital electronics. We actively began to apply our module and gain significant experience. Our team put together small book of exercises for our modified constructor, there are up to 50 tasks sorted by complexity. Adding the Universal Module to electronics constructor transformed it to a fully capable digital electronics laboratory. To demonstrate wide opportunities of our Universal Module we built the controllable car, it consist of memory module, motor control modules, digital generators and other required elements. It takes multiple commands, memorizes them and then executes them one by one. Our Universal Module Constructor is intended to teach students step by step, familiarize them with electronics basic transistor logic as well as with parts of the processor.

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