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Controller for microfluidic large-scale integration

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**Title:** Controller for microfluidic large-scale integration

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**Abstract:**

Microfluidic devices with integrated valves provide precise, programmable fluid handling platforms for high-throughput biological or chemical assays. However, setting up the infrastructure to control such platforms often requires specific engineering expertise or expensive commercial solutions. To address these obstacles, we present a Kit for Arduino-based Transistor Array Actuation (KATARA), an open-source and low-cost Arduino-based controller that can drive 70 solenoid valves to pneumatically actuate integrated microfluidic valves. We include a python package with a GUI to control the KATARA from a personal computer. No programming experience is required.

**Keywords:** python; Arduino shield; open source hardware; solenoid valve; microfluidics; multi-layer soft lithography

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