

# Small physics experiments using sensors and actuators with computer acquisition and control

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Today's physics experiments mostly involve some sensors, which convert physics parameters to be measured into electronic signals, and a computer reading these signals, storing and treating them and producing some human readable output.

The workshop will show all steps to be performed and give the participants a chance to implement simple simulated experiments themselves. Digital signals are generated with a push button switch, analogue signals with a potentiometer. As display we use a simple LED or a ring of rgb LEDs.

An ESP32 micro-controller with a MicroPython interpreter installed in its flash memory will be used to read out the sensors (switch and potentiometer) and to control the data display (LEDs). The hardware was selected for its very low price (13 US\$ per station) and its simplicity of use. The participants will develop their own short programs running on the micro-controller.

The course notes, slides, exercise sheet and solutions are freely available on the WEB:

<https://afnog.iotworkshop.africa/do/view/AFNOG/ASP2022>

This workshop is a very much stripped down version of a course on the Internet of Things (IoT) developed initially for the University of Cape Coast, Ghana. Again all information on this course is available at [https://afnog.iotworkshop.africa/do/view/IoT\\_Course\\_English/WebHome](https://afnog.iotworkshop.africa/do/view/IoT_Course_English/WebHome) or a slightly different version in French:

[https://afnog.iotworkshop.africa/do/view/IoT\\_Course\\_French/WebHome](https://afnog.iotworkshop.africa/do/view/IoT_Course_French/WebHome).