Linux for Embedded Objects 1 kit documentation

Important instructions

This kit has been expensive to put together for teaching purposes. We wish to use only the best teaching materials, but we can only do this if all students take good care of these materials. Therefore please observe the following:

- All exercises can be conducted with the materials in the kit and the prerequisites defined for the course. No tools are needed and should not be used.
- Please do not cut any wires or solder onto any of the printed circuit boards (PCB’s).
- Please read the “Keep the electronics safe” slide carefully.
- Please return the kit at the last course module in the same condition as you received it: Before returning please remove any surplus materials and make a full inventory check. Please notify the teacher if something is defective or missing.

Keeping the electronics safe

By far the highest risk is erroneously connected circuits. We all make mistakes, and it happens surprisingly often in electronics. So please double- and triple-check your circuit before connecting the power. Otherwise the electronics and maybe your computer if connected can fry themselves.

Most electronics is electrostatic sensitive. Therefore please avoid touching the components on the PCB by keeping them in the enclosure or on the bread board. If you absolutely must handle a PCB, then please touch the edges only as shown in the picture.

Handle PCBs by touching the edges only

You may not think about it, but your hands sometimes carry small residues of acid or other destructive substances. For instance eating an apple while working with a PCB is a bad idea, as the acid may slowly destroy the electronics. Keep your hands clean while working with electronics.

Please keep the electronics far away from any food or liquid. The do not work well together...

SDU

Raspberry Pi embedded computer

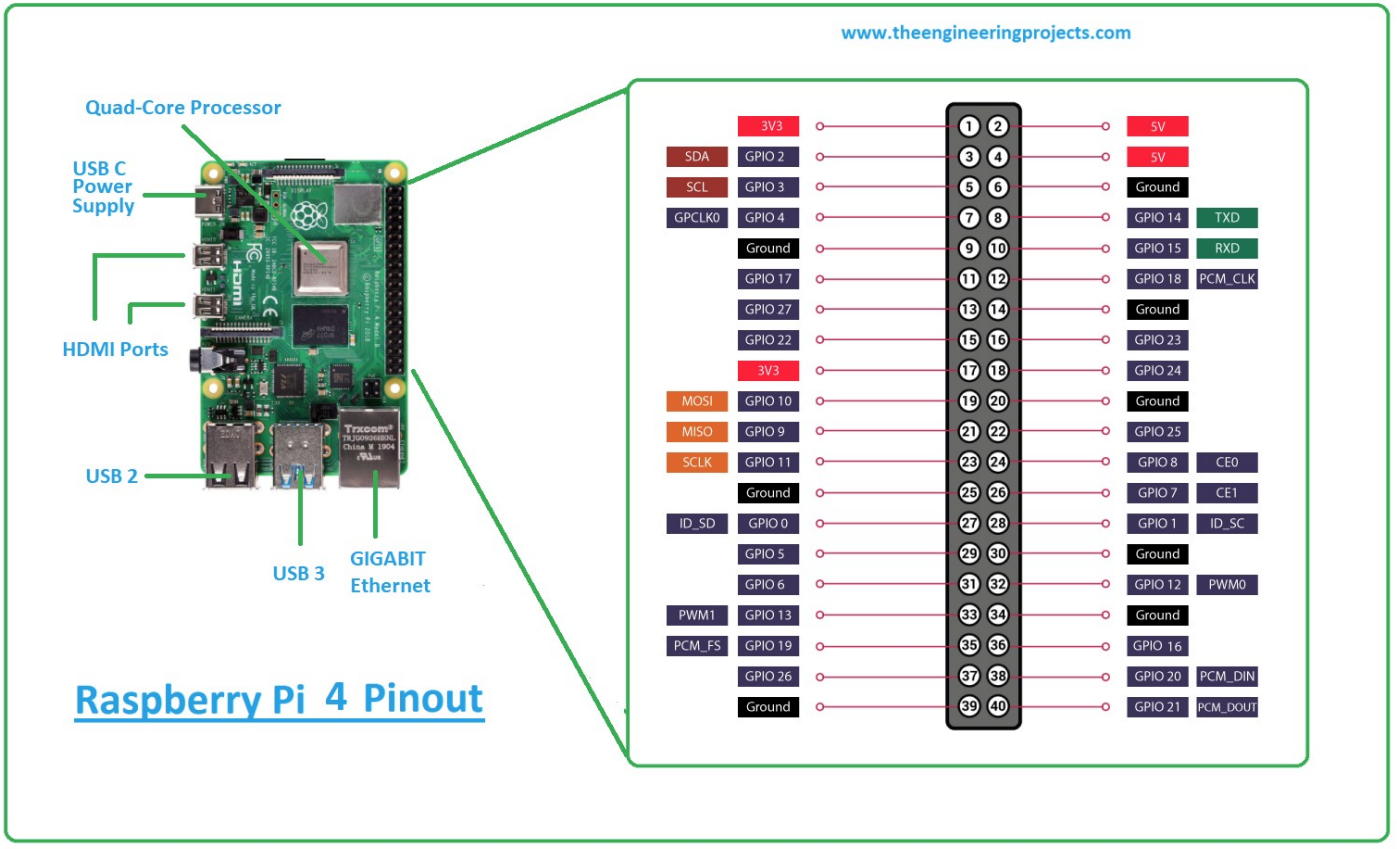
Content

1 Raspberry Pi 4
1 Raspberry Pi 4 enclosure
1 USB-C power supply
1 MicroSD card 16/32 Gb
1 SD-MicroSD adaptor

You can open the enclosure by gently pressing onto the two triangle symbols while lifting the lid upwards.

SDU

Raspberry Pi embedded computer



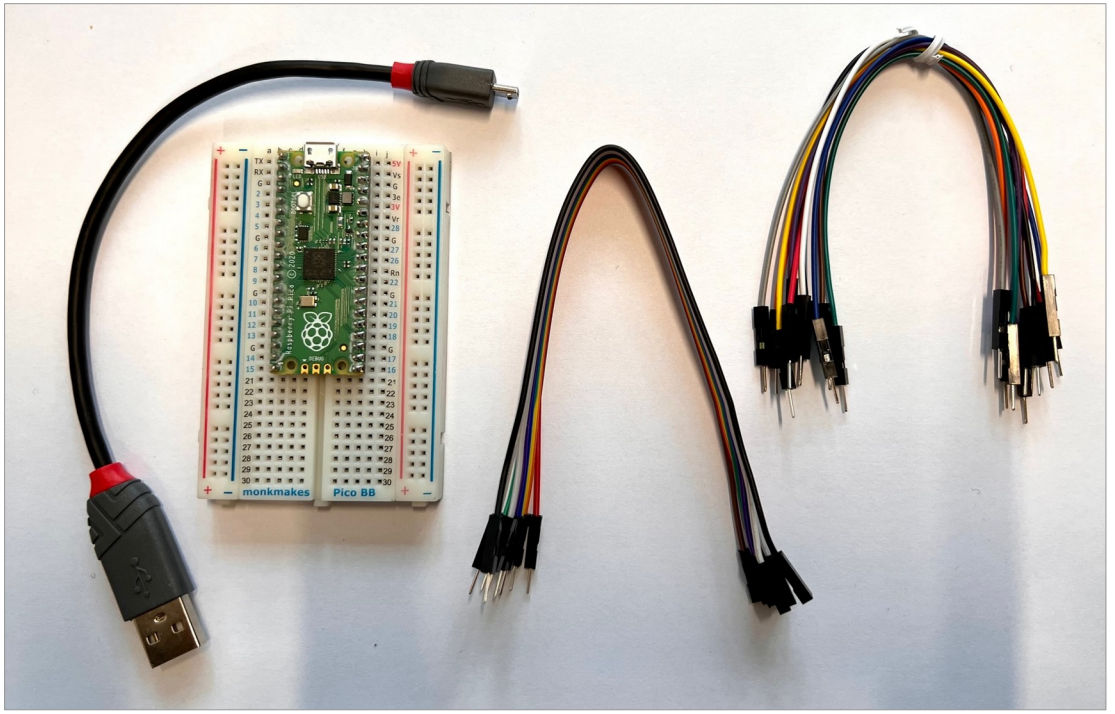
Documentation:
https://www.raspberrypi.com/documentation/computers/raspberry-pi.html#raspberry-pi-4-model-b
https://datasheets.raspberrypi.com/rpi4/raspberry-pi-4-datasheet.pdf
Image source: https://www.theengineeringprojects.com

SDU

Raspberry Pico microcontroller

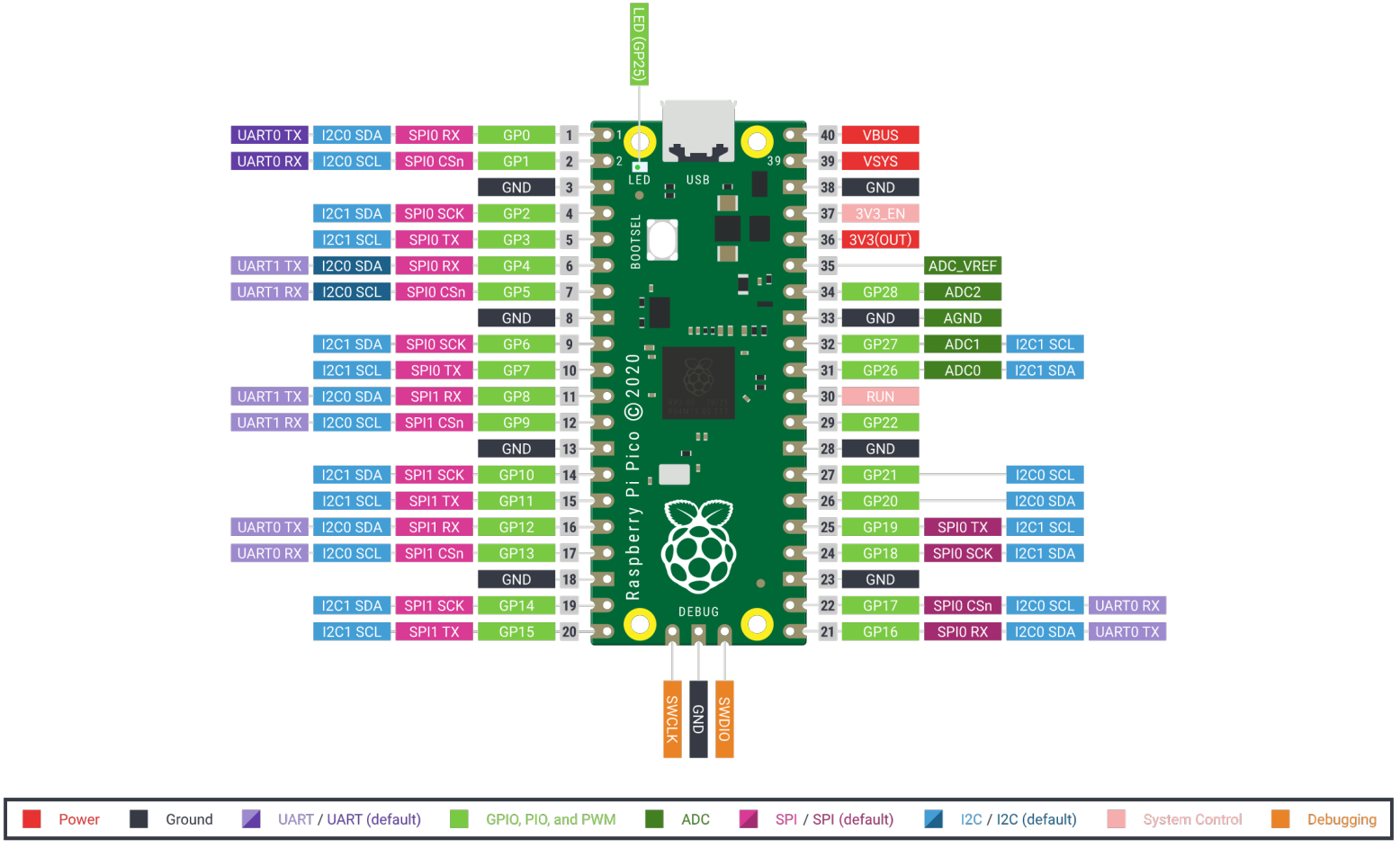
Content

1 Raspberry Pico
1 Breadboard
1 Micro USB cable
10 Test wires male-male
10 Test wires male-female
2 Test wires female-female



SDU

Raspberry Pico microcontroller



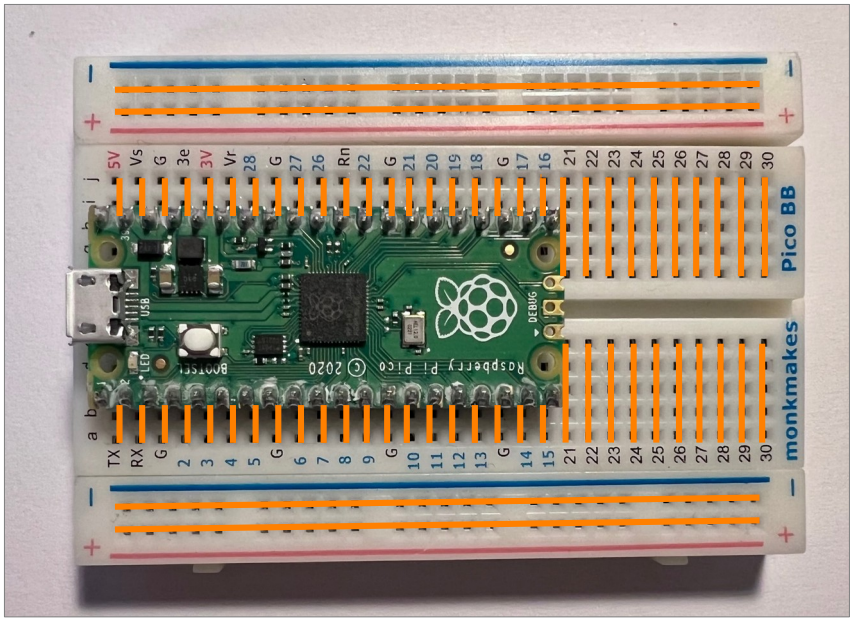
Documentation: https://www.raspberrypi.com/documentation/microcontrollers/raspberry-pi-pico.html

SDU

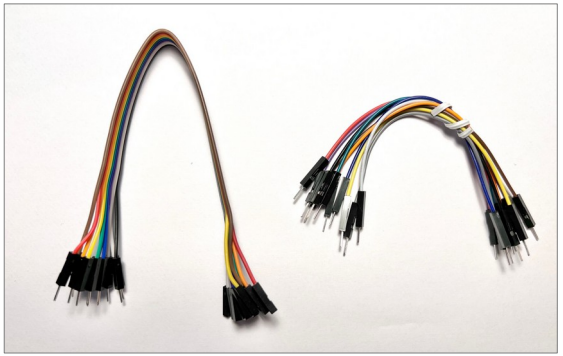
Breadboard

Please do not remove the Raspberry Pico from the breadboard. Instead use the extra space next to the Pico for the exercises.

The orange lines on the illustration shows how the pinholes are connected. These connections facilitate building up the experimental circuits using the test wires.



Orange lines show how the breadboard pinholes are connected



Test wires for building cirtuits

Electronics components

Content

1 Push button
1 Piezo horn
1 MCP3008 ADC
1 Photosensitive resistor
2 LED
2 Resistor 220 Ohm
1 Resistor 10K Ohm
1 Servo

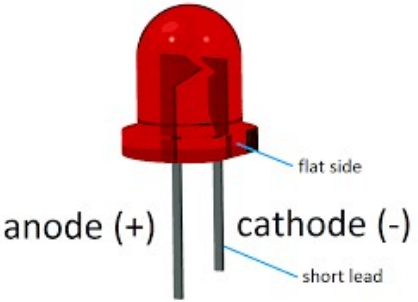


Image source: https://www.pinterest.nz