

Why we will use microPython

Rapid prototyping with microPython devices

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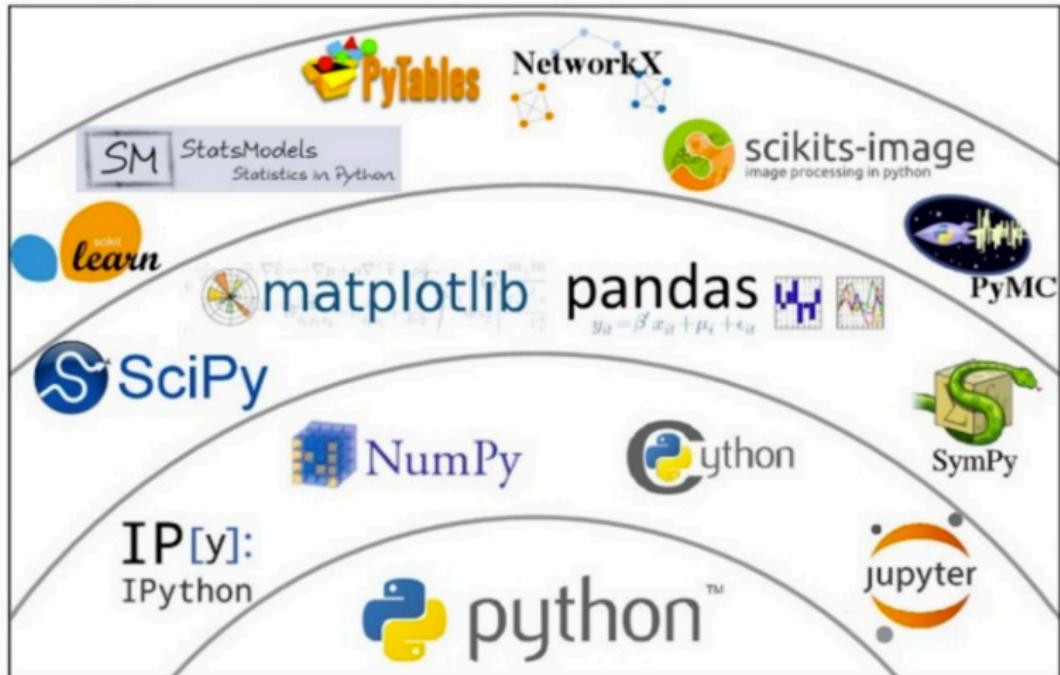
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Why micropython?

Worldwide, Apr 2018 compared to a year ago:

Rank	Change	Language	Share	Trend
1		Java	22.62 %	-0.8 %
2		Python	22.05 %	+5.2 %
3	↑↑	Javascript	8.56 %	+0.2 %
4	↓	PHP	8.22 %	-1.8 %
5	↓	C#	7.95 %	-0.7 %
6		C	6.38 %	-1.1 %
7	↑	R	4.26 %	+0.4 %
8	↓	Objective-C	3.7 %	-1.0 %

python ecosystem



micropython

MicroPython is a lean and fast implementation of the Python 3 programming language that is optimised to run on a microcontroller. MicroPython was successfully funded via a Kickstarter campaign and the software is now available to the public under the MIT open source license. It ensures that the memory size/microcontroller performance is optimised and fit for purpose for the application it serves. Many sensor reading and reporting applications do not require a PC based processor as this would make the total application over priced and under-efficient.

micropython options



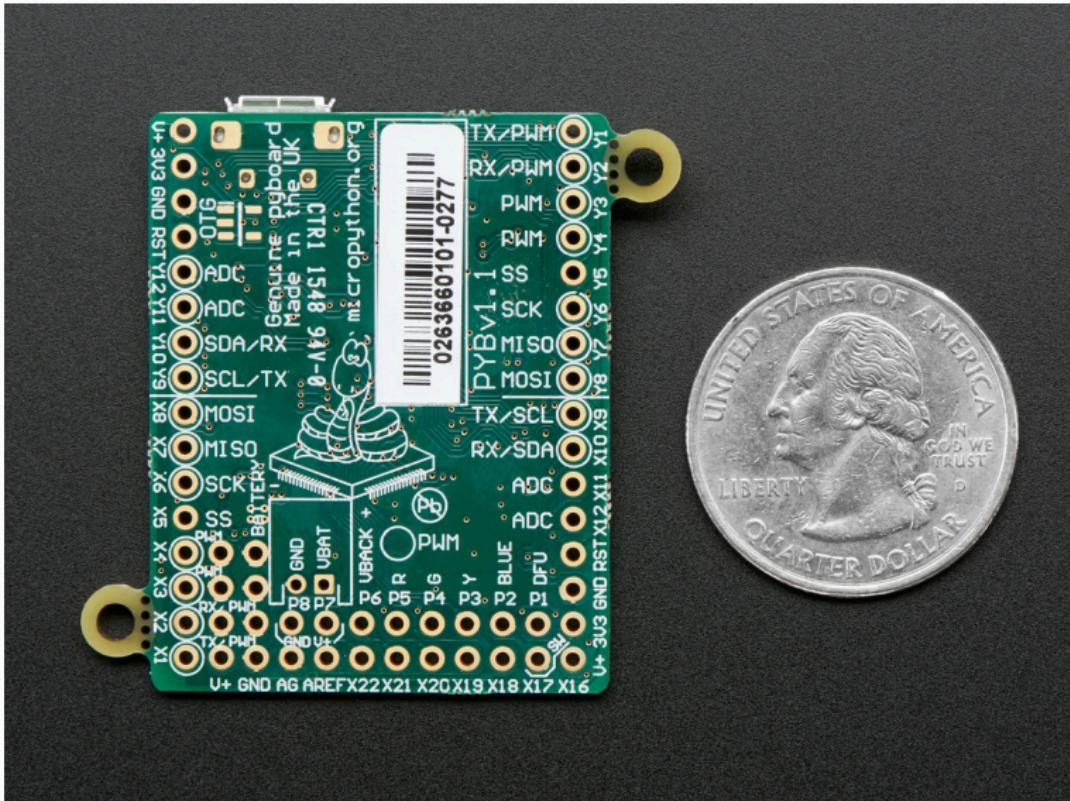
pyboard

The MicroPython **pyboard** is a compact electronic circuit board that runs MicroPython on the bare metal, giving you a low-level Python operating system that can be used to control all kinds of electronic projects.

MicroPython is packed full of advanced features such as an interactive prompt, arbitrary precision integers, closures, list comprehension, generators, exception handling and more. Yet it is compact enough to fit and run within just 256k of code space and 16k of RAM.

MicroPython aims to be as compatible with normal Python as possible to allow you to transfer code with ease from the desktop to a microcontroller or embedded system.

pyboard



MicroPython pyboard feature table

BOARD			
description	The original pyboard v1.1	Pyboard lite v1.0 with accelerometer	Pyboard lite v1.0
SKU	PYBv1.1	PYBLITEv1.0-AC	PYBLITEv1.0
PRICE			
GBP incl. tax	£28.00	£22.60	£19.60
approx EUR incl. tax	€39.20	€31.60	€27.40
approx USD excl. tax	\$35.00	\$28.25	\$24.50
MICROCONTROLLER			
MCU	STM32F405RG	STM32F411RET6	STM32F411RET6
CPU	Cortex-M4F	Cortex-M4F	Cortex-M4F
internal flash	1024k	512k	512k
RAM	192k	128k	128k
maximum frequency	168MHz	96MHz	96MHz
hardware floating point	single precision	single precision	single precision

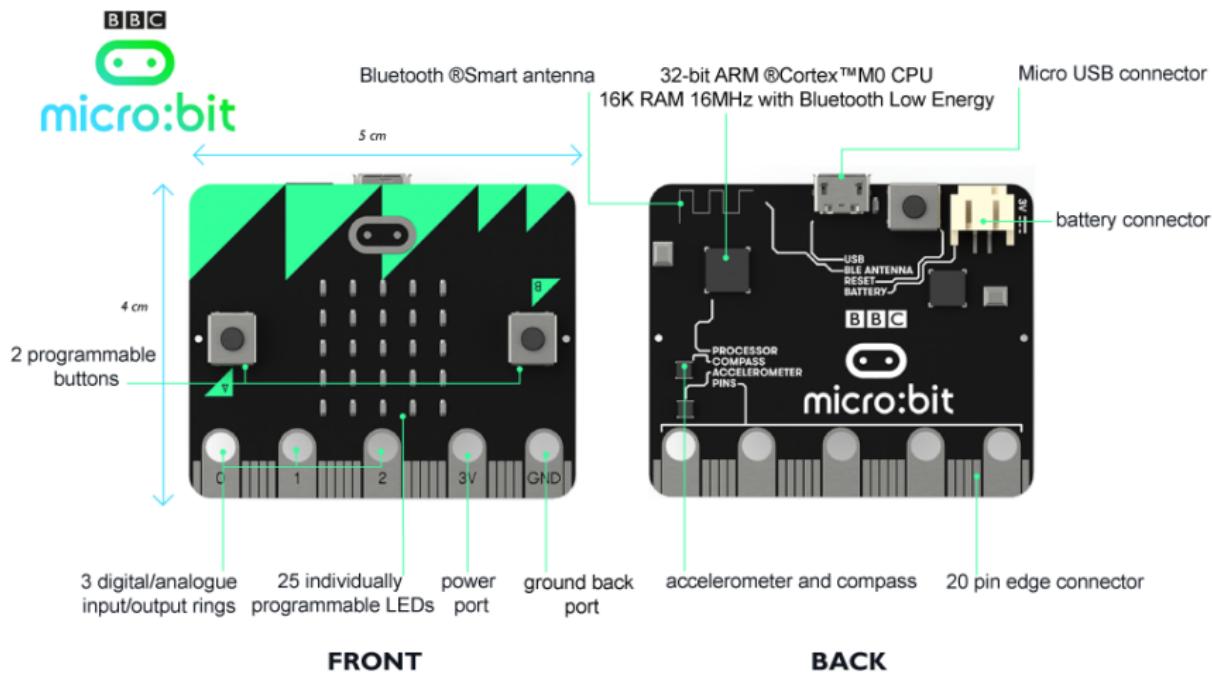
ESP8266: low cost



ESP8266: characteristics

- 802.11 b/g/n
- Built-in TCP / IP protocol stack
- Built-in PLL, voltage regulator and power management components
- 802.11b mode + 19.5dBm output power
- Built-in temperature sensor
- off leakage current is less than 10uA
- Built-in low-power 32-bit CPU: can double as an application processor
- SDIO 2.0, SPI, UART
- standby power consumption of less than 1.0mW

BBC Micro:bit

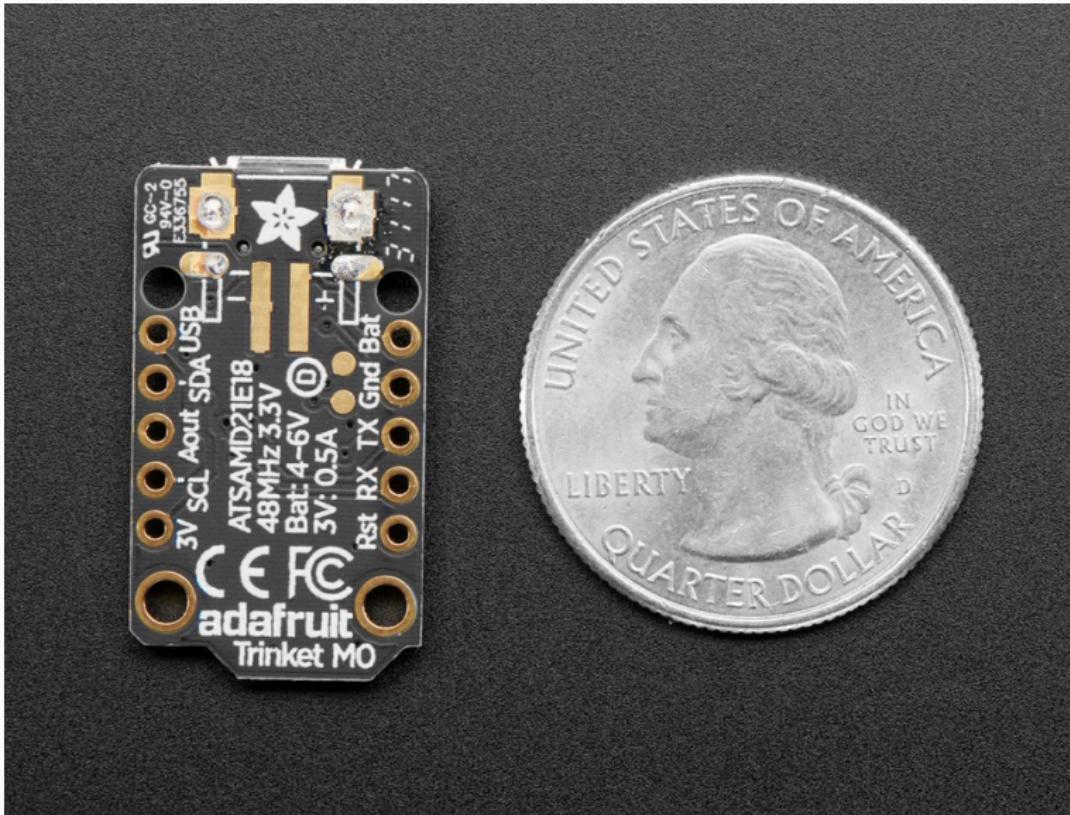


BBC Micro:bit

The Micro Bit is an ARM-based embedded system designed by the BBC for use in computer education in the UK.

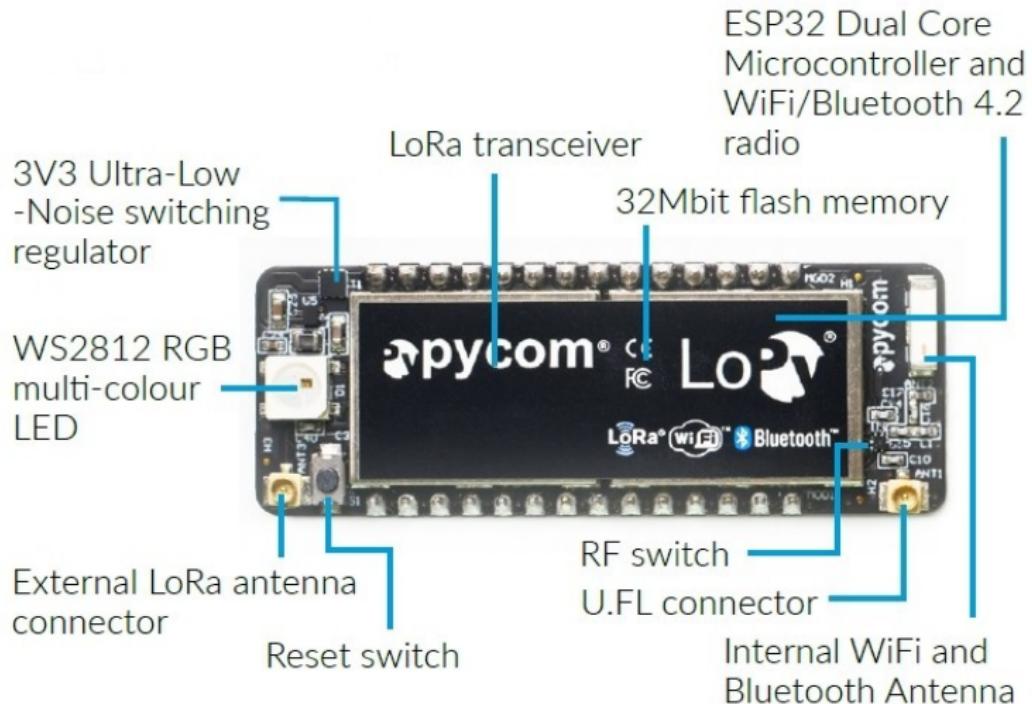
The board has an ARM Cortex-M0 processor, accelerometer and magnetometer sensors, Bluetooth and USB connectivity, a display consisting of 25 LEDs, two programmable buttons, and can be powered by either USB or an external battery pack. The device inputs and outputs are through five ring connectors that are part of the 23-pin edge connector.

Trinket





pycom: LoPy



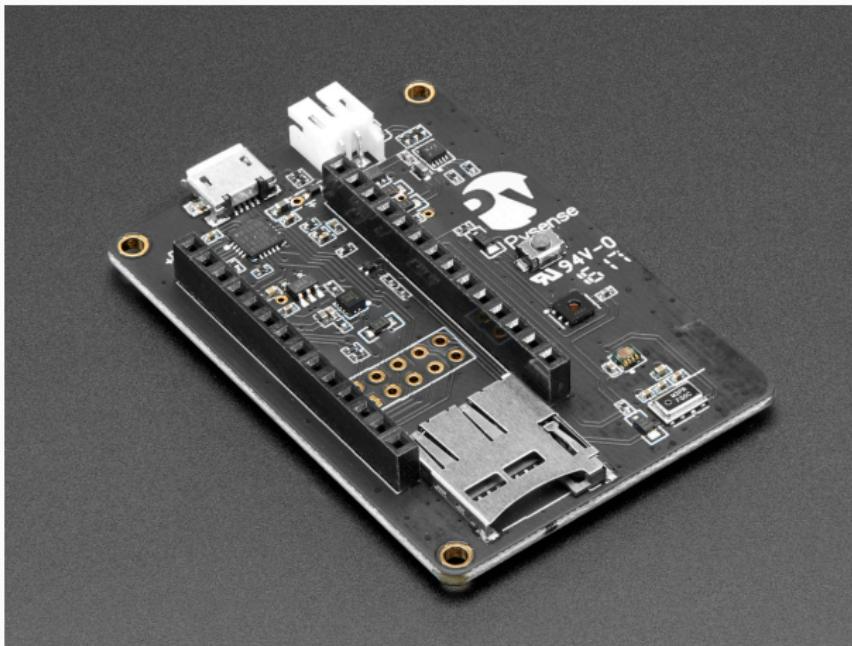
pycom: LoPy4

- Espressif ESP32 chipset
- Quadruple network MicroPython enabled development board (LoRa, Sigfox, WiFi, Bluetooth)
- RAM: 4MB (vs 512KB)
- External flash: 8MB (vs 4MB)

pycom: Expansion Board



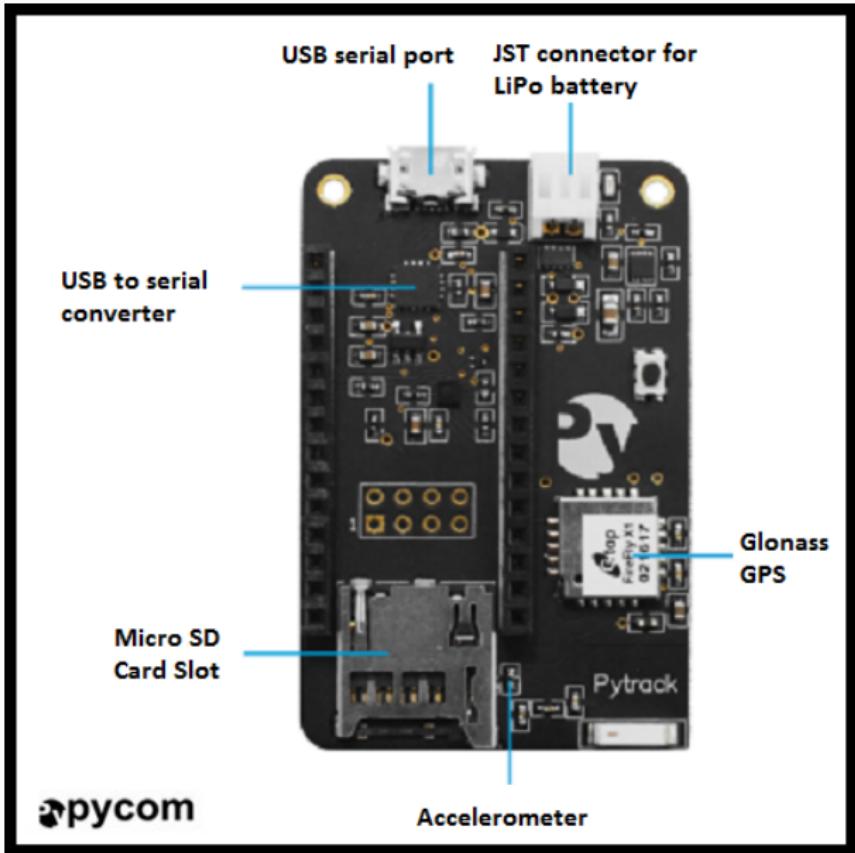
pycom: PySense



pycom: PySense

- Ambient light sensor
- Barometric pressure sensor
- Humidity sensor
- 3 axis 12-bit accelerometer
- Temperature sensor
- USB port with serial access
- LiPo battery charger
- MicroSD card compatibility
- Ultra low power operation (1uA in deep sleep)

pycom: PyTrack



pycom: PyTrack

- GNSS + Glonass GPS
- 3 axis 12-bit accelerometer
- USB port with serial access
- LiPo battery charger
- MicroSD ard compatibility
- Ultra low power operation (1uA in deep sleep)