

# Raspberry Pi

## GPIO Cheat Sheet

### I<sup>2</sup>C

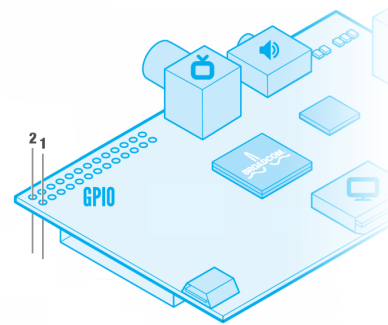
A low-speed interface used to communicate with multiple simple devices and sensors via a two-wire interface.

Inter-Integrated Circuit (I<sup>2</sup>C) is a serial bus interface which supports multiple devices and only requires two wires for communication (no separate clock or device select needed). It is, however, limited to relatively low speeds (usually 10-100kbit/s).

### CLK

Clock signals are used to provide a pulse that can synchronise different parts of a system that perform actions which are time sensitive to each other.

GPCLK0 is a general purpose clock that generates a square-wave clock signal up to a maximum frequency of around 75MHz.



The UART pins on the Raspberry Pi are primarily provided for access to the serial console which is a relatively advanced feature that most people won't need to use.

Universal Asynchronous Receiver/Transmitter (UART) is a method of transmitting data over a serial connection. Both of the communicating devices contains a shift register that converts the bytes of data being transmitted into a stream of bits.

### UART

Provides an 'analogue style' supply that can be used for controlling motors and LEDs.

With PWM (pulse-width modulation) the amount of power delivered to the device is controlled by switching the supply on and off very quickly, typically thousands of times a second.

### PWM

		3V3	1	2	5V0		
	I <sup>2</sup> C	GPIO 2	SDA0	3	4	5V0	
		GPIO 3	SCL0	5	6	GND	
	CLK	GPIO 4	GPCLK0	7	8	TXD	GPIO 14
					9	10	RXD
			GND	11	12	PWM	GPIO 18
		GPIO 17	P17	13	14	GND	
		GPIO 27	P27	15	16	P23	GPIO 23
		GPIO 22	P22	17	18	P24	GPIO 24
			3V3	19	20	GND	
	SPI	GPIO 10	MOSI	21	22	P25	GPIO 25
		GPIO 9	MISO	23	24	CE0	GPIO 8
		GPIO 11	SCLK	25	26	CE1	GPIO 7
		GND	GND				

**Original (Rev 1) Raspberry Pi users:**  
The original Raspberry Pi had slightly different GPIO pin numbering. GPIO 2 was GPIO 0, GPIO 3 was GPIO 1, and GPIO 27 was GPIO 21.

Often used to read more complicated sensors, drive simple displays, or communicate between devices.

Serial Peripheral Interface Bus (SPI) is a synchronous full-duplex (two way) serial connection. Communication happens between a master device and slave device with the master device providing synchronisation.

The data is transmitted on the MOSI (master-out, slave-in) and MISO pins (master-in, slave-out) pins. Each transmission is synchronised by a clock pulse on SCLK.

### SPI