I2C Cheat Sheet

by CRImier via cheatography.com/28046/cs/8263/

Basics

Slaves have addresses by which they respond, address might be configurable

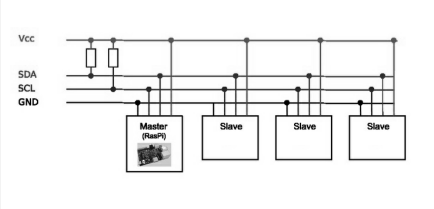
Master requests data from slaves or sends data to them, slaves answer

SDA/SCL wired in parallel, each connected to 3.3V through a resistor (called pullup resistor)

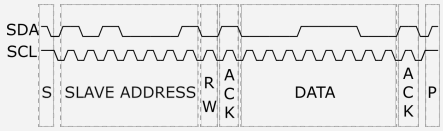
Resistor is needed because lines can only be made low, neither master nor slave can make a line high

No need to use Python GPIO functions because there's a separate Raspberry Pi block able to speak I2C which we can use to communicate in I2C language

I2C bus connection



I2C signal



Registers

Reading and writing

Errors

Usage

Communication between microcontrollers

Getting data from sensors

Reading/writing memory chips

Adding GPIO to your project

Configuring I2C-enabled devices

i2cdetect

```
Call "i2cdetect -y bus_num" in command line to
scan for devices:
         0 1 2 3 4 5 6 7 8 9 a b c d e f
00: -- -- -- -- -- -- -- -- -- -- -- -- --
10: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
-
20: -- -- -- -- -- -- -- 27 -- -- -- -- -- -- -- --
-
30: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
-
40: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
-
50: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
UU
60: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
-
70: -- -- -- -- -- -- -- --
Hexade cimal number means that device responded.
UU means this address is taken by the Linux
kernel.
```

I2C buses and bus numbers

```
Do "ls /dev/i2c*" in command-line to list
available I2C buses (separate I2C lines, Raspberry
Pi has 1 available). /dev/i2c-1 means bus number
1.
Most likely, bus number will be 1, but check
anyway.
```

CLI utilities for reading&writing I2C

```
#Read a byte from I2C device:
i2cget -y bus_num dev_addr register # If unsure,
leave register at 0
#Write a byte to I2C device:
i2cget -y bus_num dev_addr register byte_value
#Dump all registers of I2C device:
!!!!!! !!! !!i 2cfump -y bus_num dev_addr register
byte_value
```

Debugging problems

Check that the I2C driver has been loaded: "sudo modprobe i2c-dev".

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