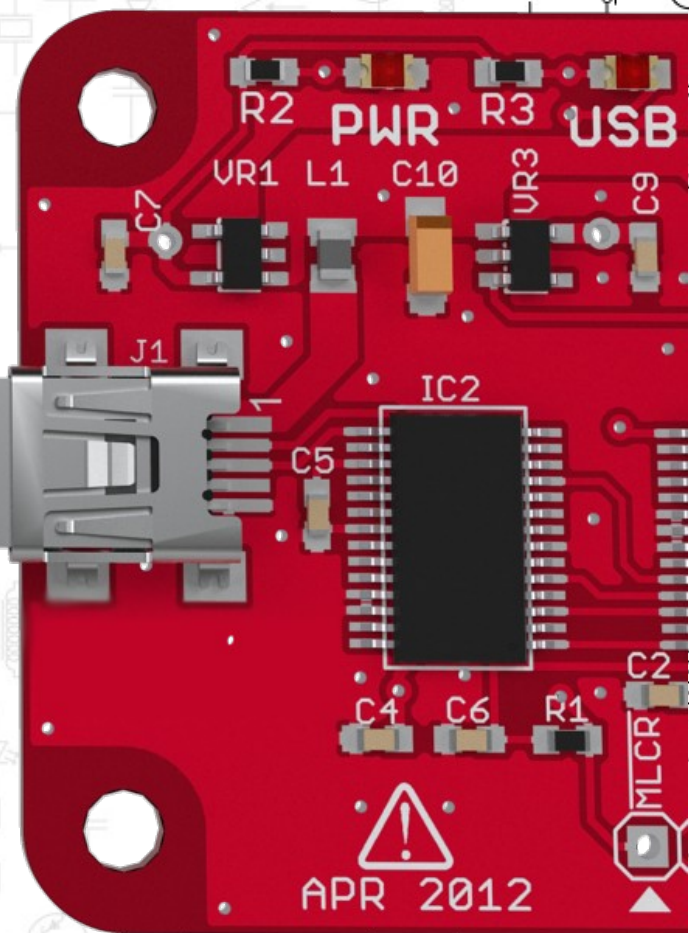
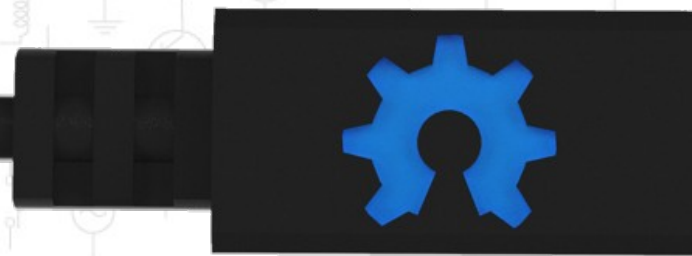


# USB and Open Source

## A Sketchy History



Ian Lesnet

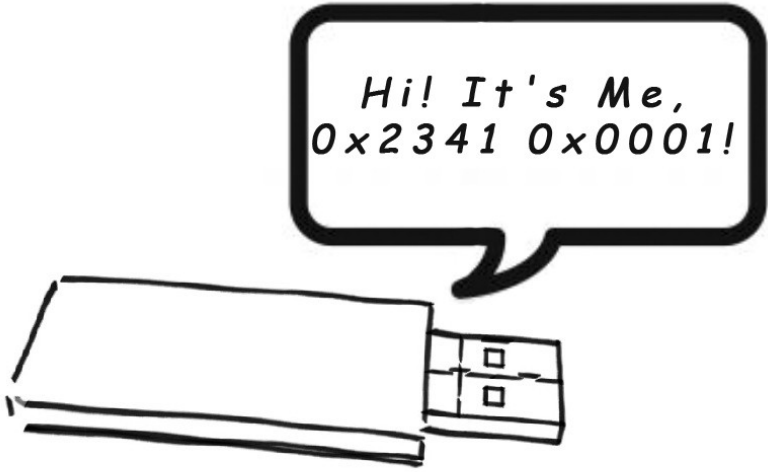


# What is a USB ID?

Every USB device has an ID number:

**“Hi! It's Me, 0x2341 0x0001!”**

Can you find my driver?



*Hi! It's Me,  
0x2341 0x0001!*



*Hi 0x2341 0x0001,  
looking up your  
driver!*



USB Vendor ID (2 bytes)

0x2341 =  
(9025)



Image: <http://www.arduino.cc>



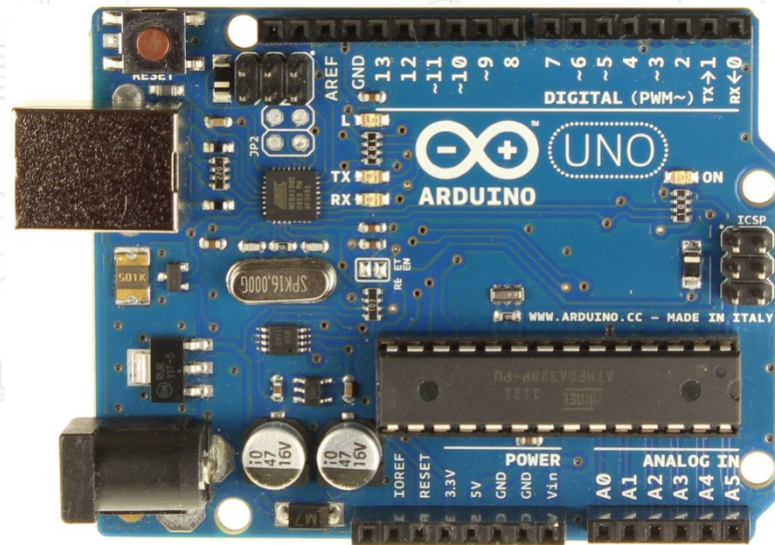


# USB Product ID (2 bytes)

0x2341 =



0x0001 =  
(1)



Images: <http://www.arduino.cc>



# Example USB descriptor

```
ROMPTR const unsigned char cdc_device_descriptor[] = {  
    0x12, // bLength  
    USB_DEVICE_DESCRIPTOR_TYPE, // bDescriptorType  
    0x00, // bcdUSB (low byte)  
    0x02, // bcdUSB (high byte)  
    0x02, // bDeviceClass  
    0x00, // bDeviceSubClass  
    0x00, // bDeviceProtocol  
    USB_EP0_BUFFER_SIZE, // bMaxPacketSize  
  
    LOWB(USB_VID), // idVendor (low byte)  
    HIGHB(USB_VID), // idVendor (high byte)  
    LOWB(USB_PID), // idProduct (low byte)  
    HIGHB(USB_PID), // idProduct (high byte)  
    LOWB(USB_DEV), // bcdDevice (low byte)  
    HIGHB(USB_DEV), // bcdDevice (high byte)  
    USB_iManufacturer, // iManufacturer  
};
```

Other stuff about the device too





# Get a USB ID

## \$2000 to USB Implementers Forum

- Group oversees USB, issues USB IDs
- 65K individual PIDs all your own (kind of..)
- To do with as you please (not really...)



Image: <http://www.flickr.com/photos/68751915@N05/6629107607/>



# 0x1337 is already taken (we asked)



Image: <http://www.flickr.com/photos/paddyis1337/3087104882/>





You can't get a custom vanity number...

**vendor INTEL**

**0x8086**

**Intel**

...unless you're a founding member (evidently)

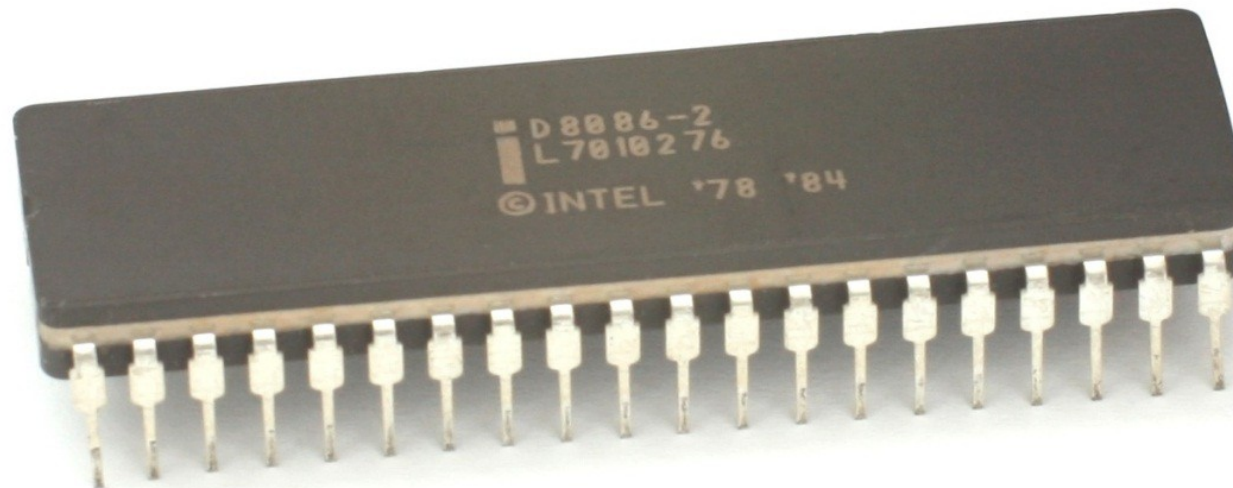


Image: [http://en.wikipedia.org/wiki/File:KL\\_Intel\\_D8086.jpg](http://en.wikipedia.org/wiki/File:KL_Intel_D8086.jpg)





# USB and Open Source

## Distribution restrictions

- Can't be shared under an open source license, can't be sublicensed



Image CC: <http://creativecommons.org/about/downloads>

Image GNU: <http://www.gnu.org/graphics/agnuhead.html>



# An actual problem

ATMEGA-based USB to serial converter chip  
on the latest Arduino

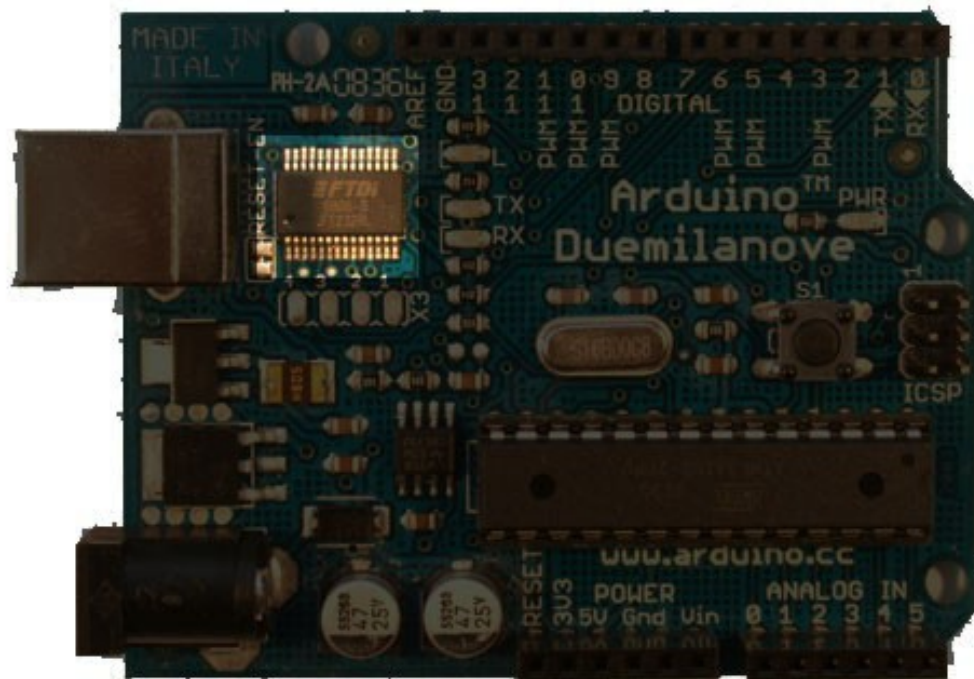


Image: <http://www.arduino.cc>





# Everyone buys their own?

\$2000 is a hefty investment for a hackerspace, open hardware project or kitchen table startup

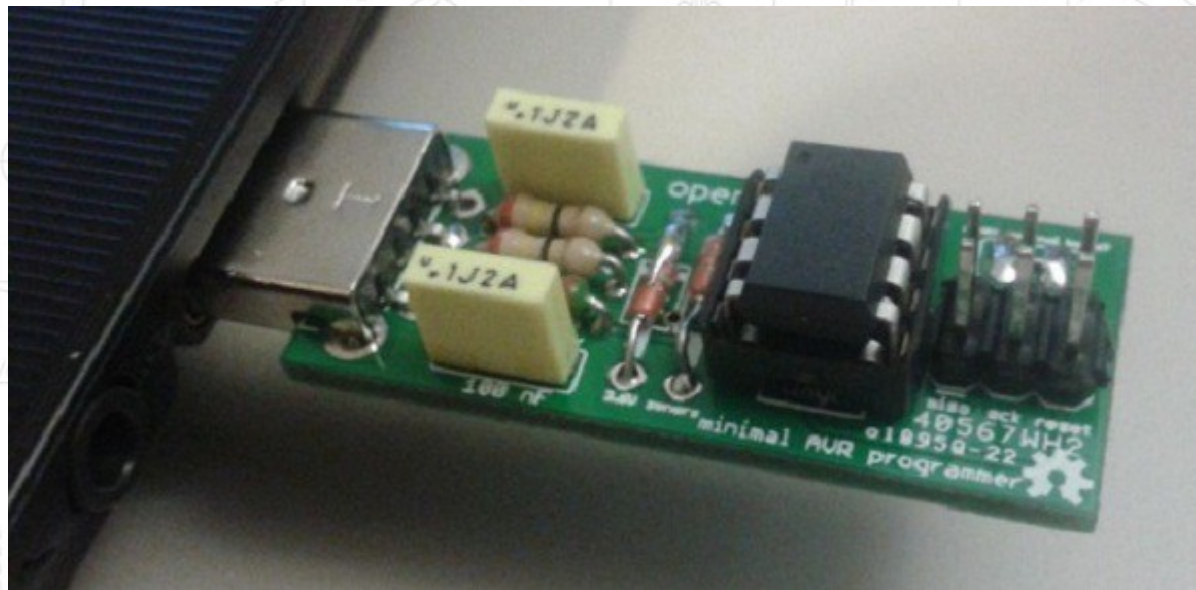


Image: <http://www.littlewire.cc>



# Resale

Each USB Vendor ID block has 65,000 numbers, so why not resell them?

- It's against the USB ID contract/license
- Let's talk about the Dutch guys who tried
- Can't MacGyver our way around it





# Squat a Range

USB IF can't resell abandoned or revoked IDs

**vendor VOTI**

**0x16C0**

**Voti**

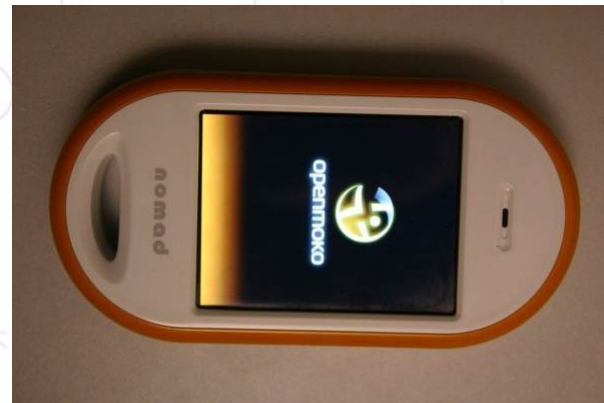
Not exactly professional but common in  
cheap electronics



# OpenMOKO USB ID scheme

## OpenMOKO open source phone

- Company dissolved, ID left to the community
- Reserving IDs on a wiki
- There's no law to prevent it (\*probably, yet)
- Fine for testing but not very professional
- Might still get nastygrams



Images: <http://wiki.openmoko.org>





# Chips that come with an ID

Use a USB chip that already has an ID

- FTDI FT232 in Arduinos
- LPC ARMs with IDs built in



# Sub license

Hardware makers may sub license USB  
IDs for their chips

Microchip (0x04D8)

- USB enabled PIC microcontrollers
- 10K limit

FTDI (0x0403)

- USB to serial converters
- Block of 8





# Potential solutions

- Relax resale and sub licensing policy
- Testing block, reserved IDs for standards
- Open block, legitimize Open Moko approach
- Wait, run out, selling singles is marketing gold



# Reform for Open Hardware

We need to do something, not currently a problem, but with more and more USB hardware the gray area of USB and Open Source will probably need to be addressed.

When there is an Open Hardware Foundation we hope they would consider doing this work on behalf of open source hardware hackers who swear too much and don't care to get waist deep in the political side.

