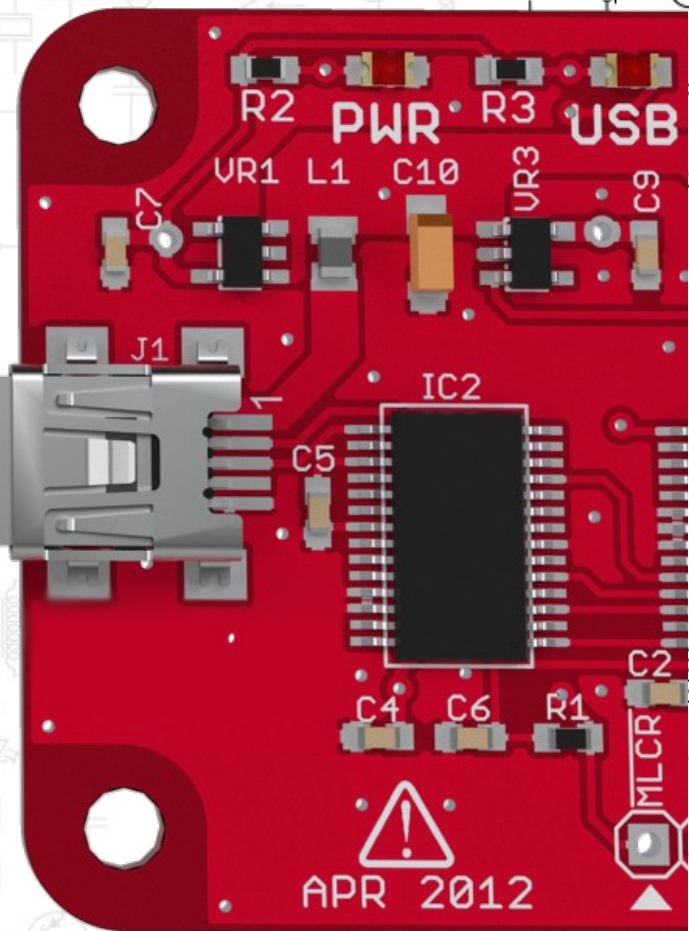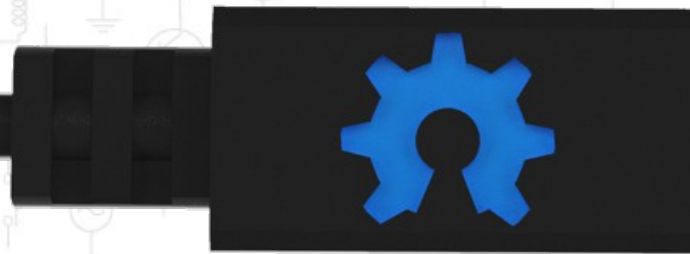# USB and Open Source
A Sketchy History

Ian Lesnet
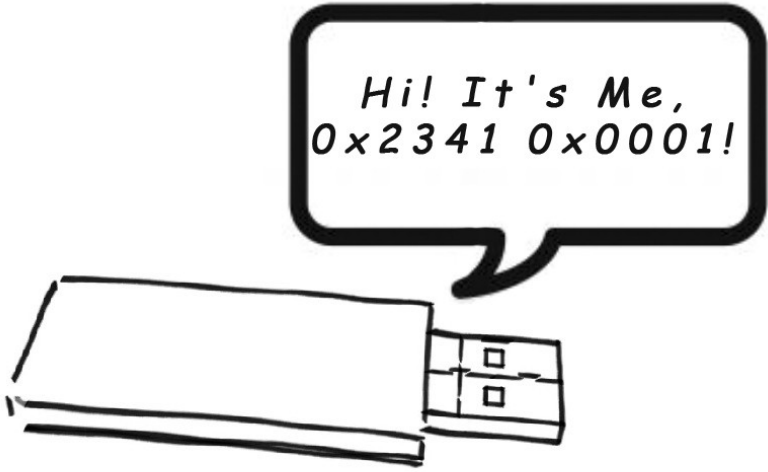
What is a USB ID?

Every USB device has an ID number:

"Hi! It's Me, <u>0x2341</u> <u>0x0001</u>!"

Can you find my driver?

USB Product ID (2 bytes)

0x2341 =

0x<u>0001</u> =
(1)

Images: http://www.arduino.cc

Example USB descriptor

```c
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)

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
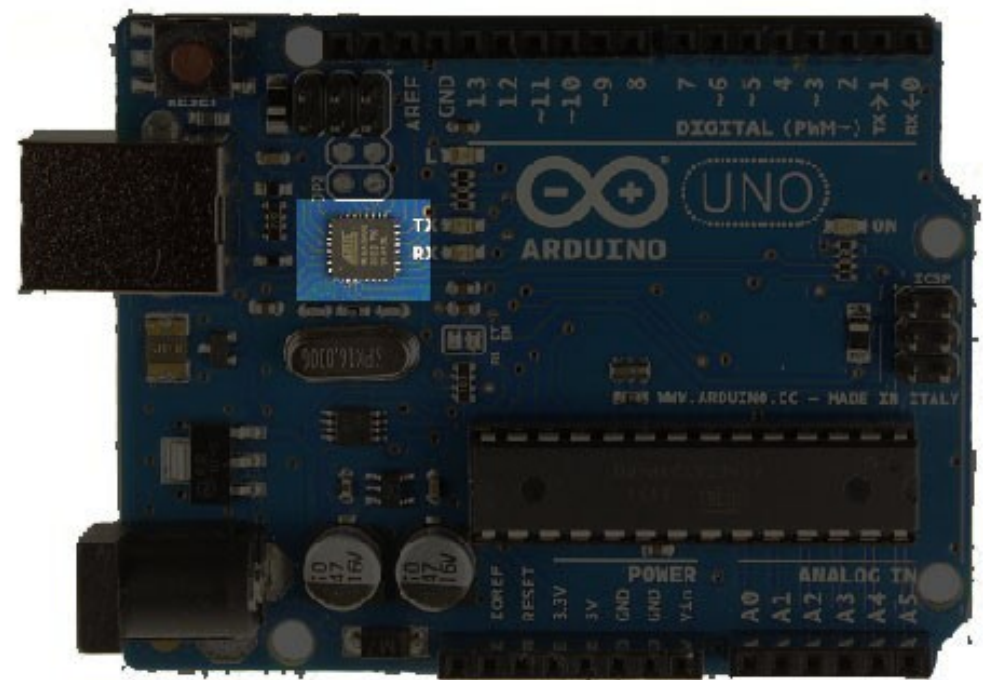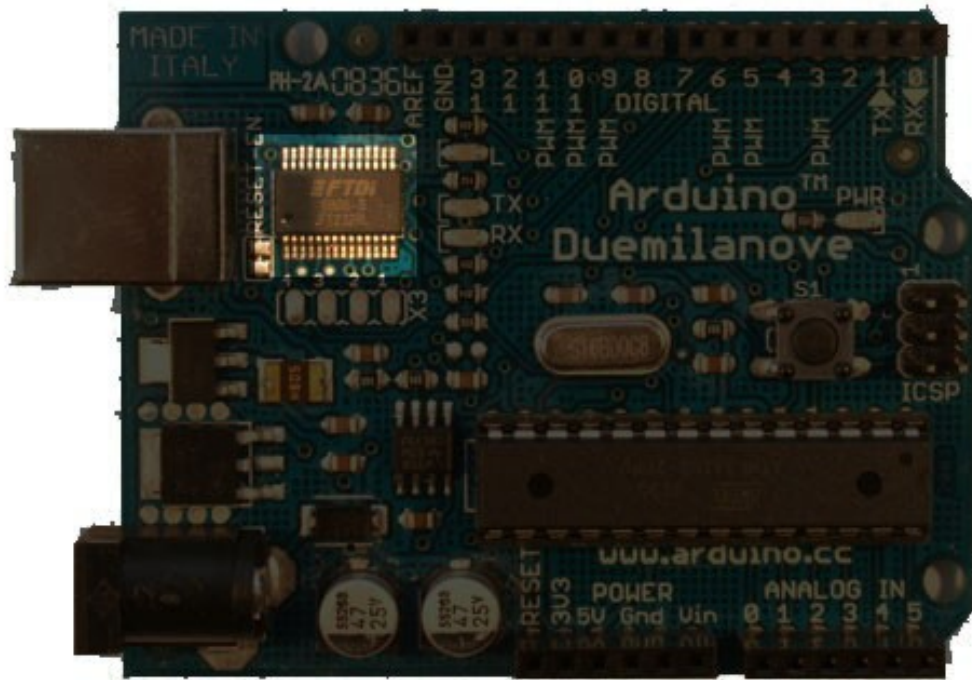
Everyone buys their own?

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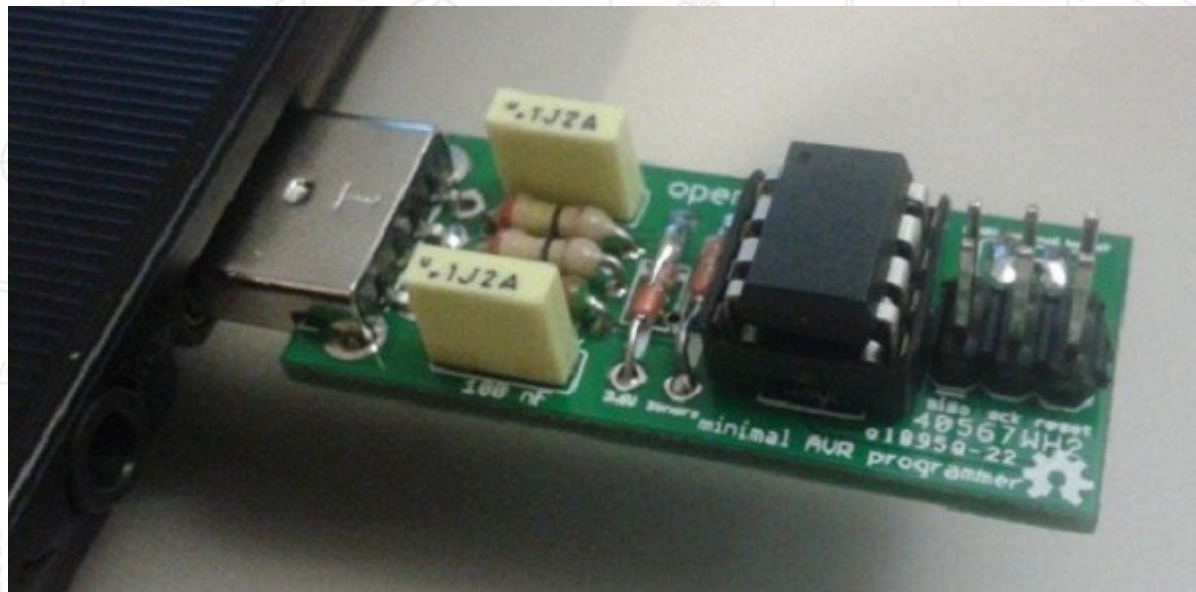

Image: http://www.littlewire.cc

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

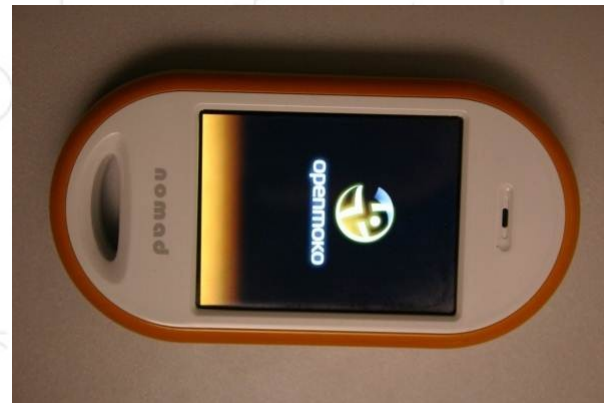**`vendor VOTI`**   **`0x16C0  Voti`**

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
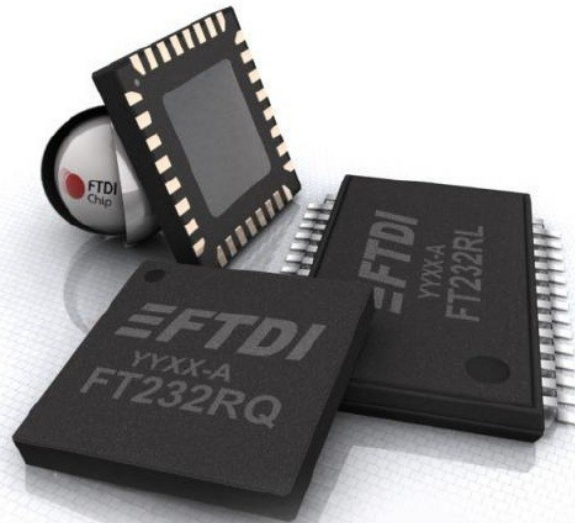

Images: http://wiki.openmoko.org

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