



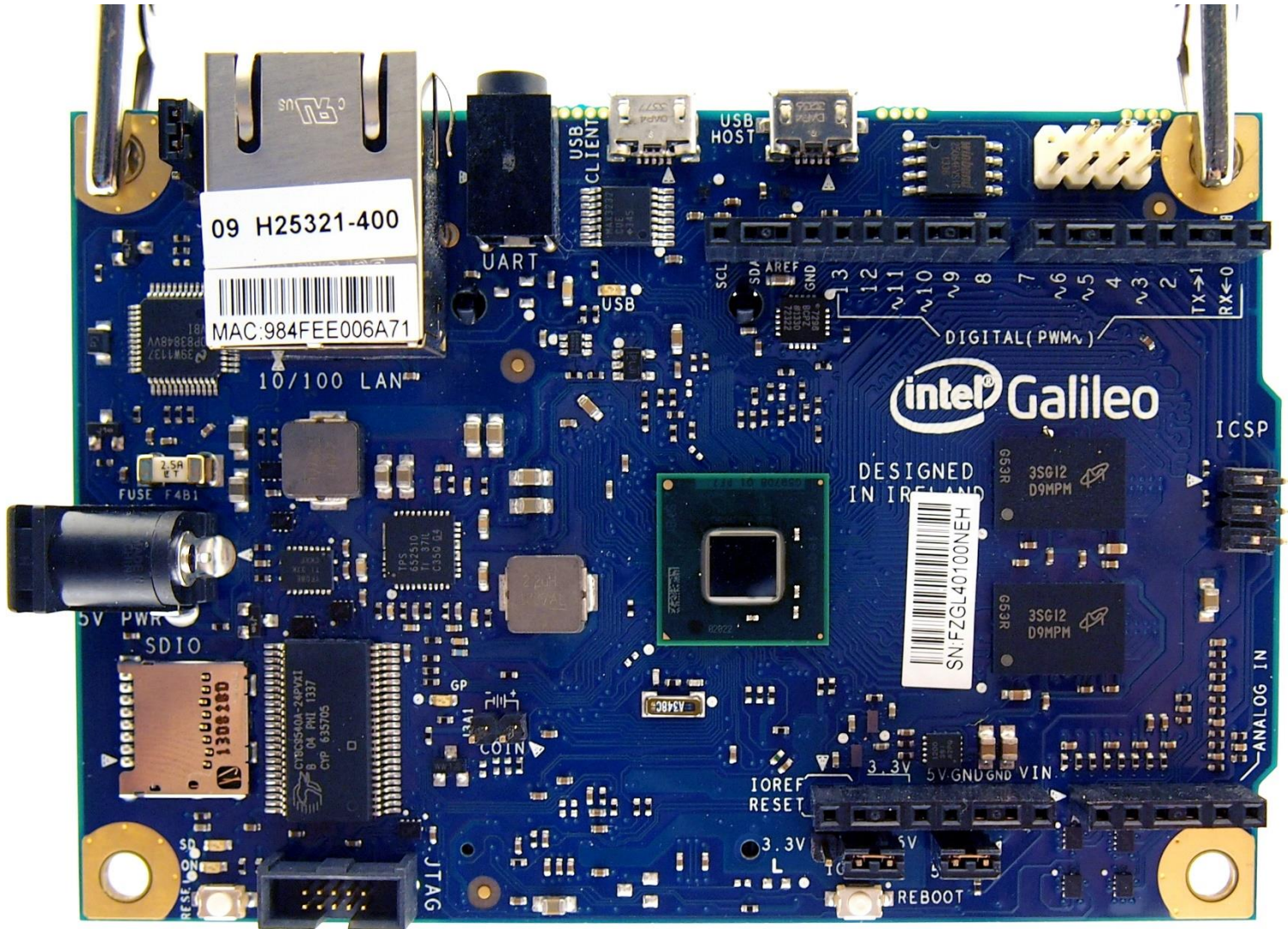
Intel RoadShow



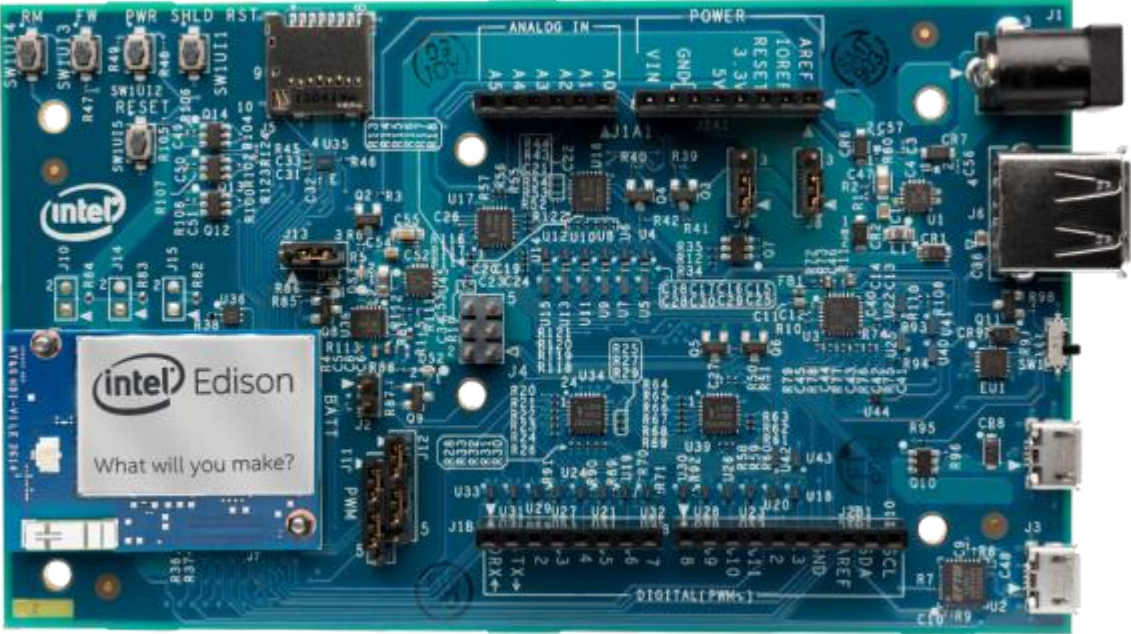
Arduino



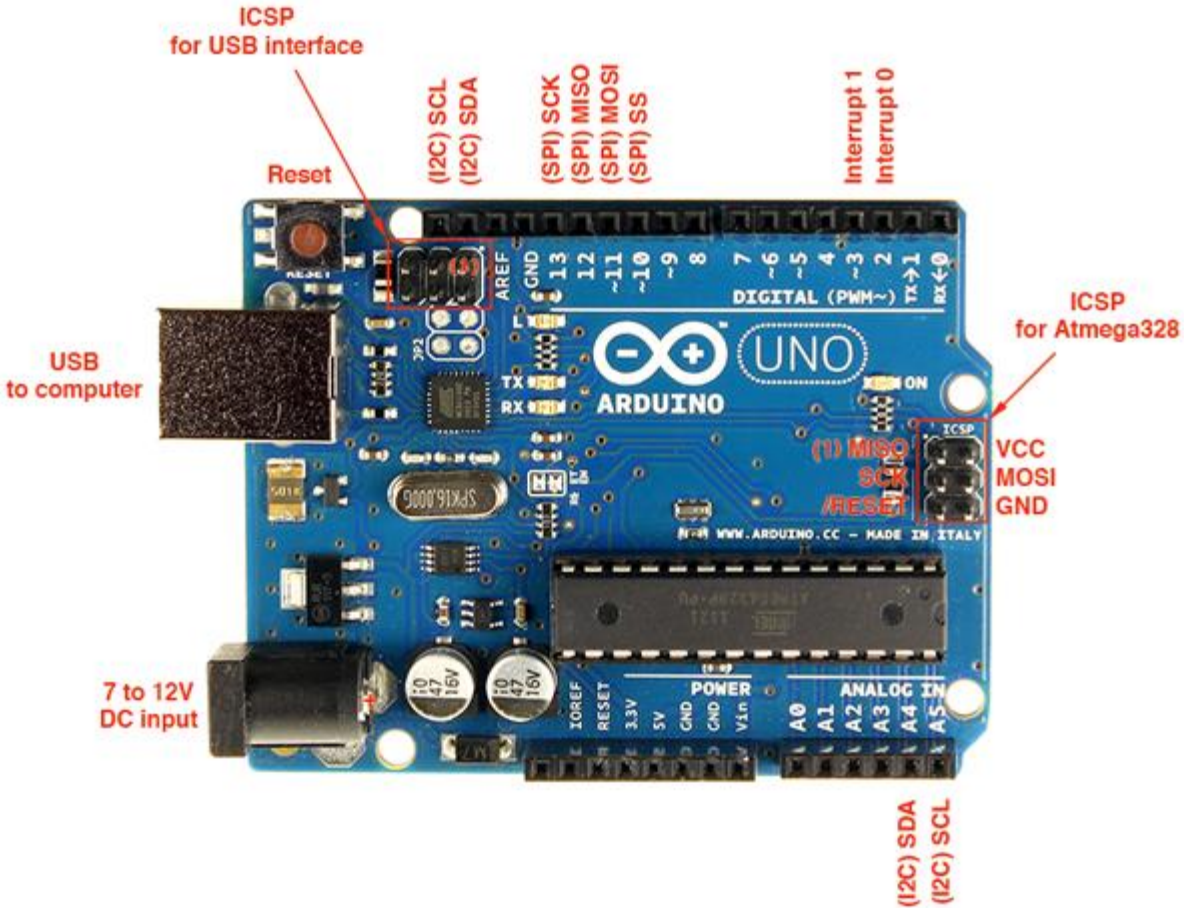
Galileo



Edison



Arduino



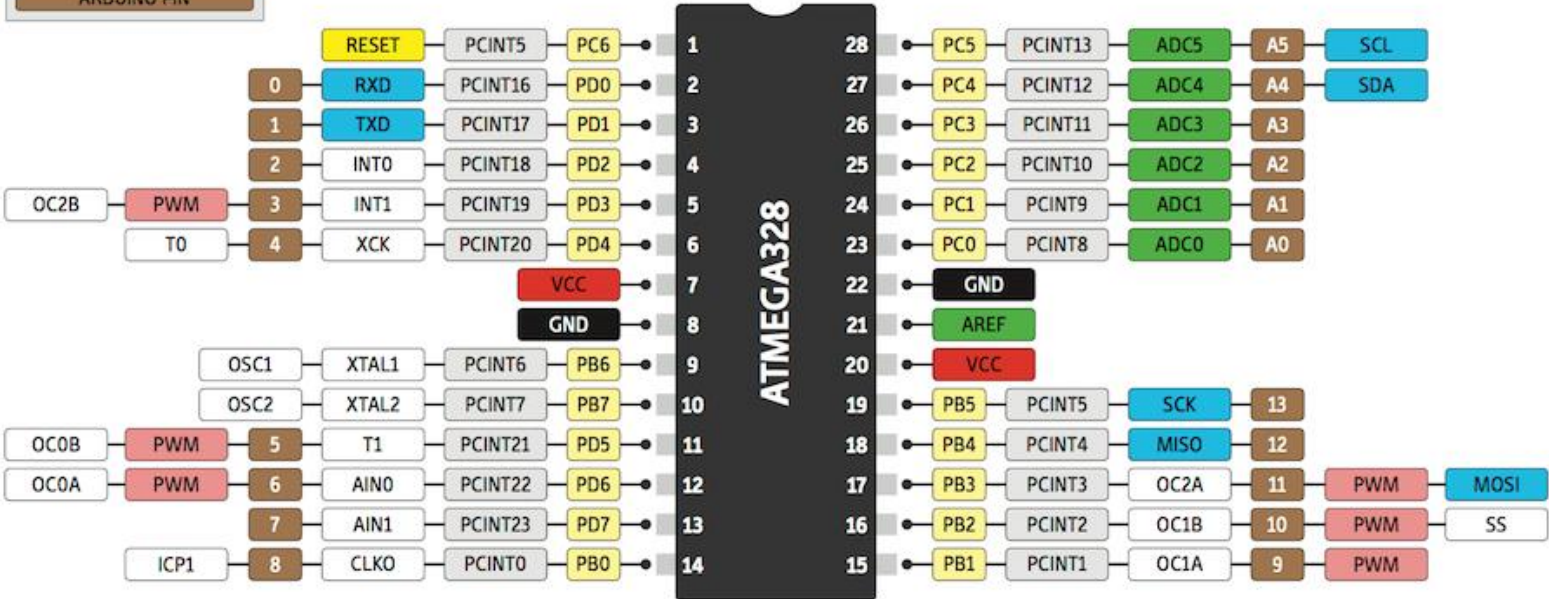
	Arduino Uno	Intel Edison
Size	7.6 x 1.9 x 6.4 cm	3.55 x 2.5 x .39 cm
Memory	0.002MB	1 GB
GPIO	14	40
Clock Speed	16 MHz	500 MHz
On Board Network	None	Dual-band (2.4 and 5 GHz) Wifi, Bluetooth 4.0
Multitasking	No	Yes
Input voltage	7 to 12 V	3.3 to 4.5 V
Flash memory	32KB	4 GB eMMC
USB	One, input only	One, peripherals OK
Operating System	None	Yocto Linux v1.6
Integrated Development Environment	Arduino IDE	Arduino IDE, Eclipse, Intel XDK

Arduino

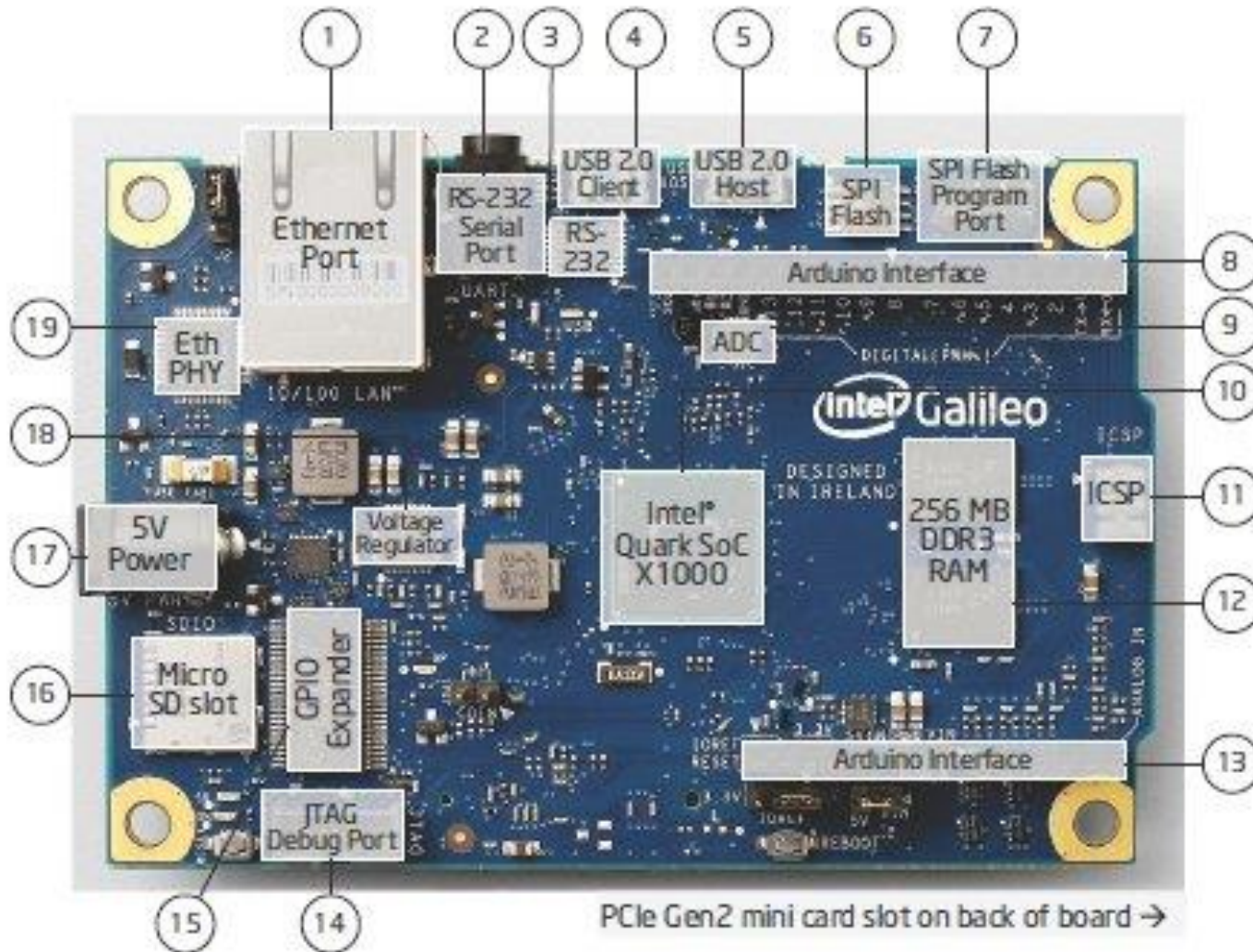
LEGEND

GND
POWER
CONTROL
PORT PIN
ATMEGA328 PIN FUNC
DIGITAL PIN
ANALOG-RELATED PIN
PWM PIN
SERIAL PIN
ARDUINO PIN

THE UNOFFICIAL
ARDUINO
 &
ATMEGA328
 PINOUT DIAGRAM



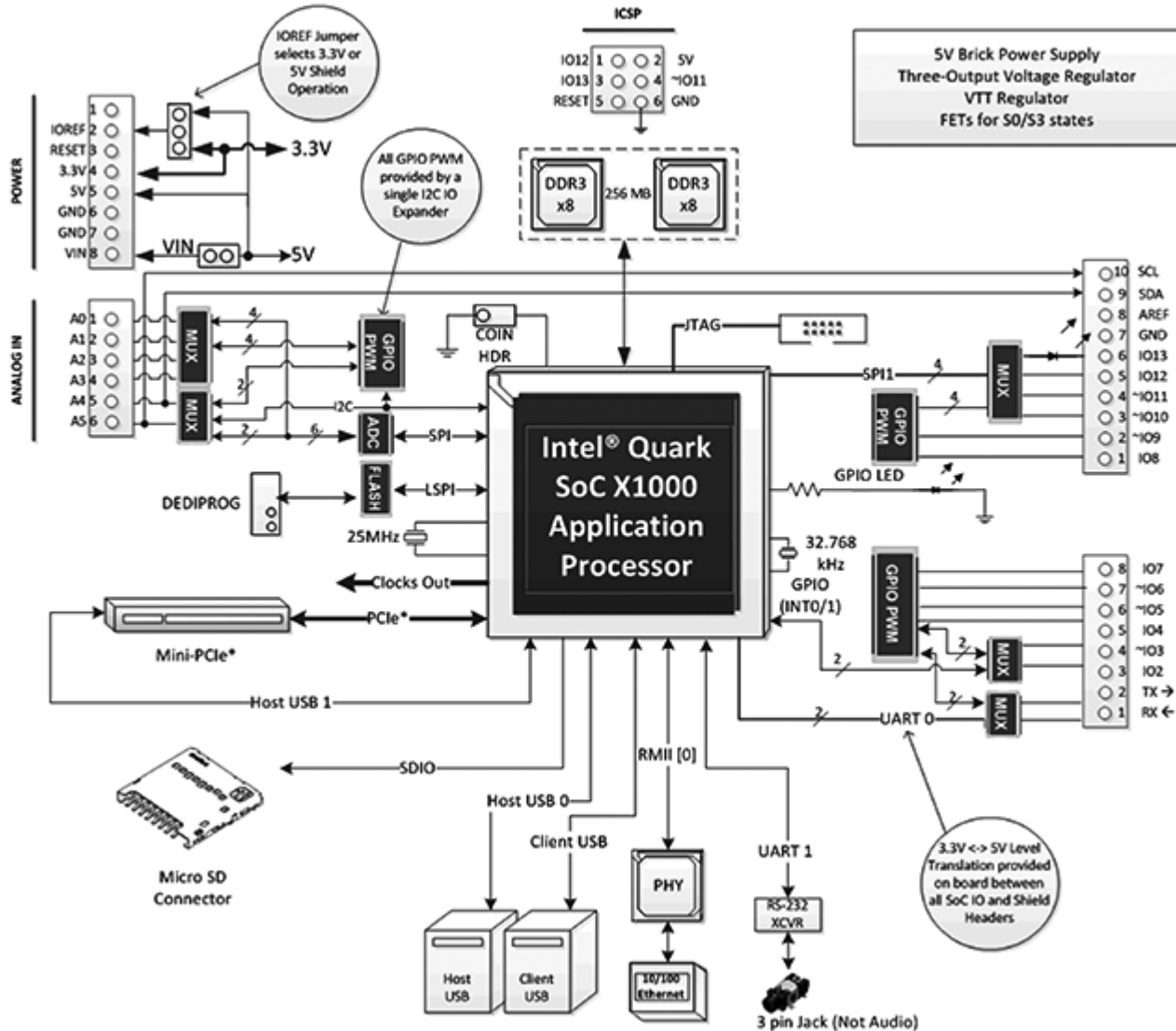
Galileo



8	Input Voltage (recommended)	5V
9	Input Voltage (limits)	5V
10	Digital I/O Pins	14 (of which 6 provide PWM output)
	Analog Input Pins	6
11	Total DC Output Current on all I/O lines	80 mA
12	DC Current for 3.3V Pin	800 mA
	DC Current for 5V Pin	800 mA

Galileo

Intel® Galileo Board Block Diagram



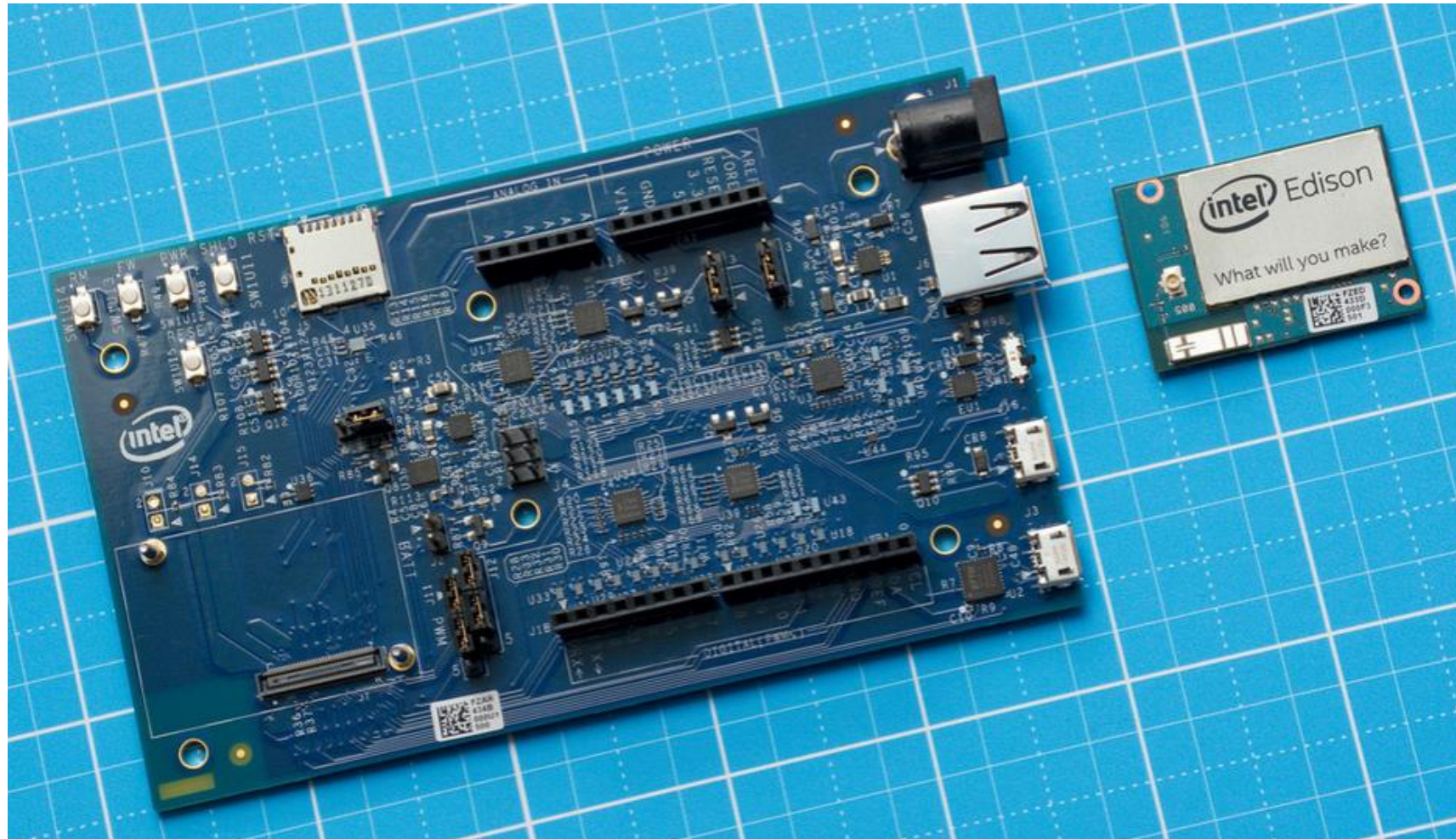
Quark SoC X1000

400 MHz 32-bit Intel

® Pentium instruction set architecture (ISA)-compatible processor

- 16 KByte L1 cache
- 512 KBytes of on-die embedded SRAM
- Simple to program: Single thread, single core, constant speed
- ACPI compatible CPU sleep states supported

Edison



Edison



Microprocessador
 Intel Atom de 500MHz com dois núcleos
 Intel Quark de 100MHz

RAM
 1Gb

Armazenamento Interno
 eMMC de 4Gb

Wireless
 Dual Band (2.4 e 5GHz) IEEE 802.11 a/b/g/n

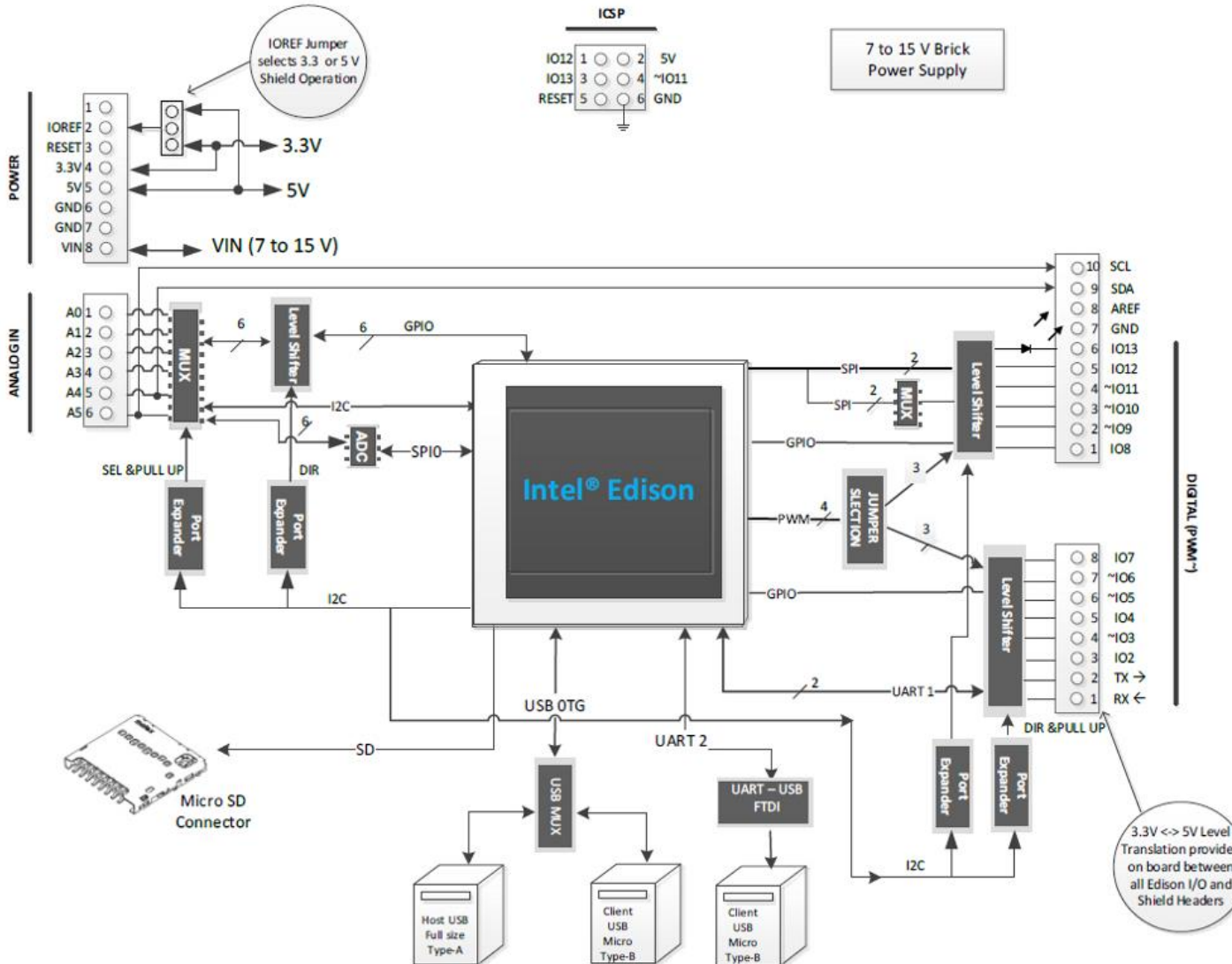
Bluetooth
 BT 4.0 + 2.1 EDR

USB 2.0
 1 Controlador OTG

I/O
 40 GPIOs que podem ser configuradas para

SD card: 1 Interface
 UART: 2 controladores
 I²C: 2 controladores
 SPI: 1 controlador com 2 chip selects
 I²S: 1 controlador

GPIO: 14 adicionais sendo que 4 tem capacidade de PWM



AMBIENTE - SKETCH

Possui sua interface própria com inúmeros exemplos iniciais

Por motivo de ser código aberto, uma infinidade de exemplos podem ser adquiridos

Rápida implementação

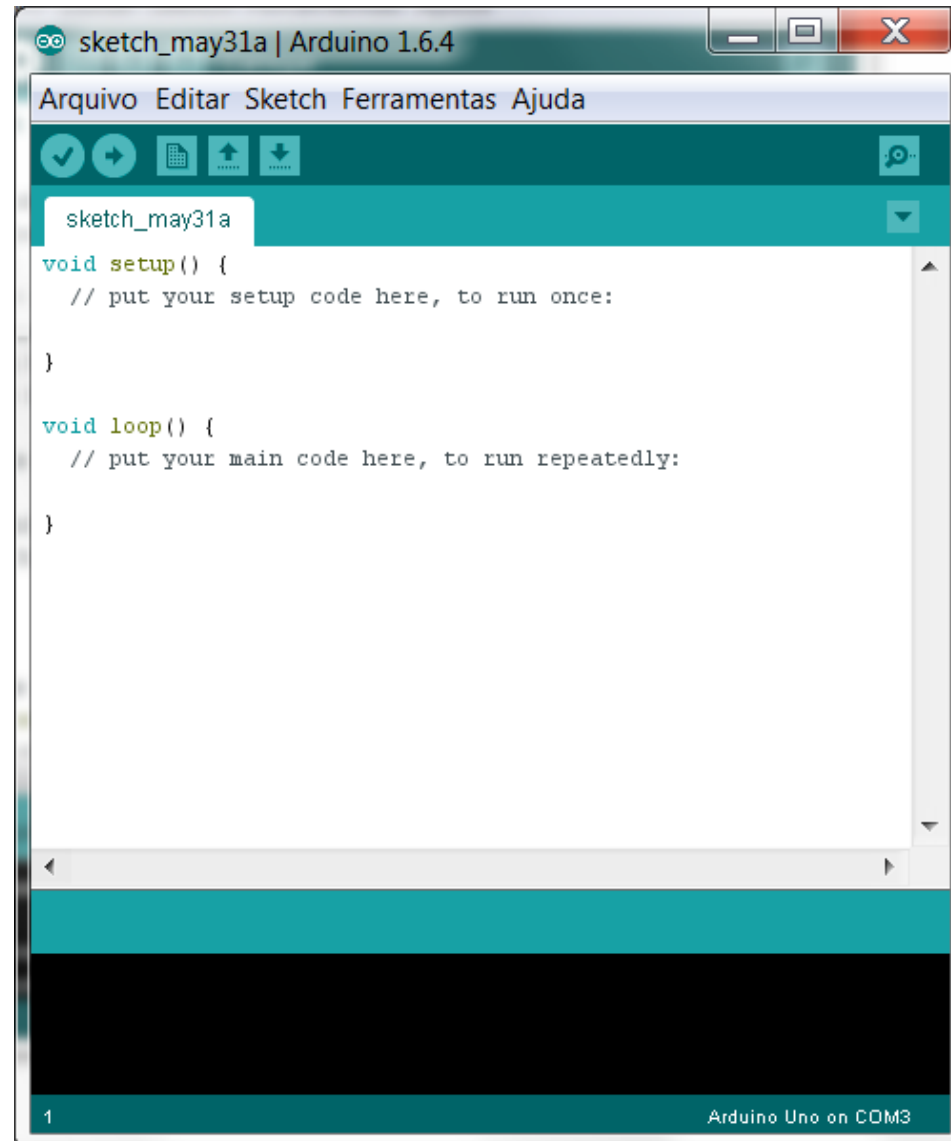
- Galileu
- Edison

Site oficial

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

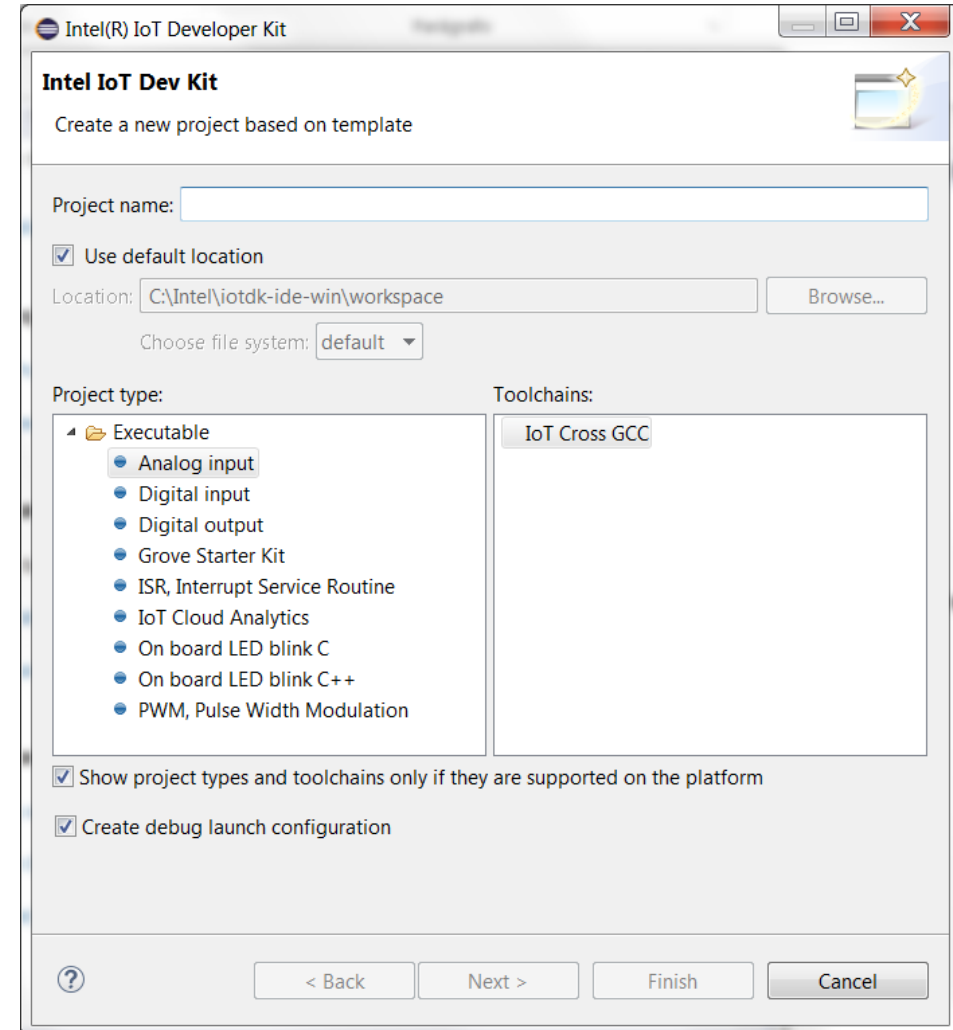
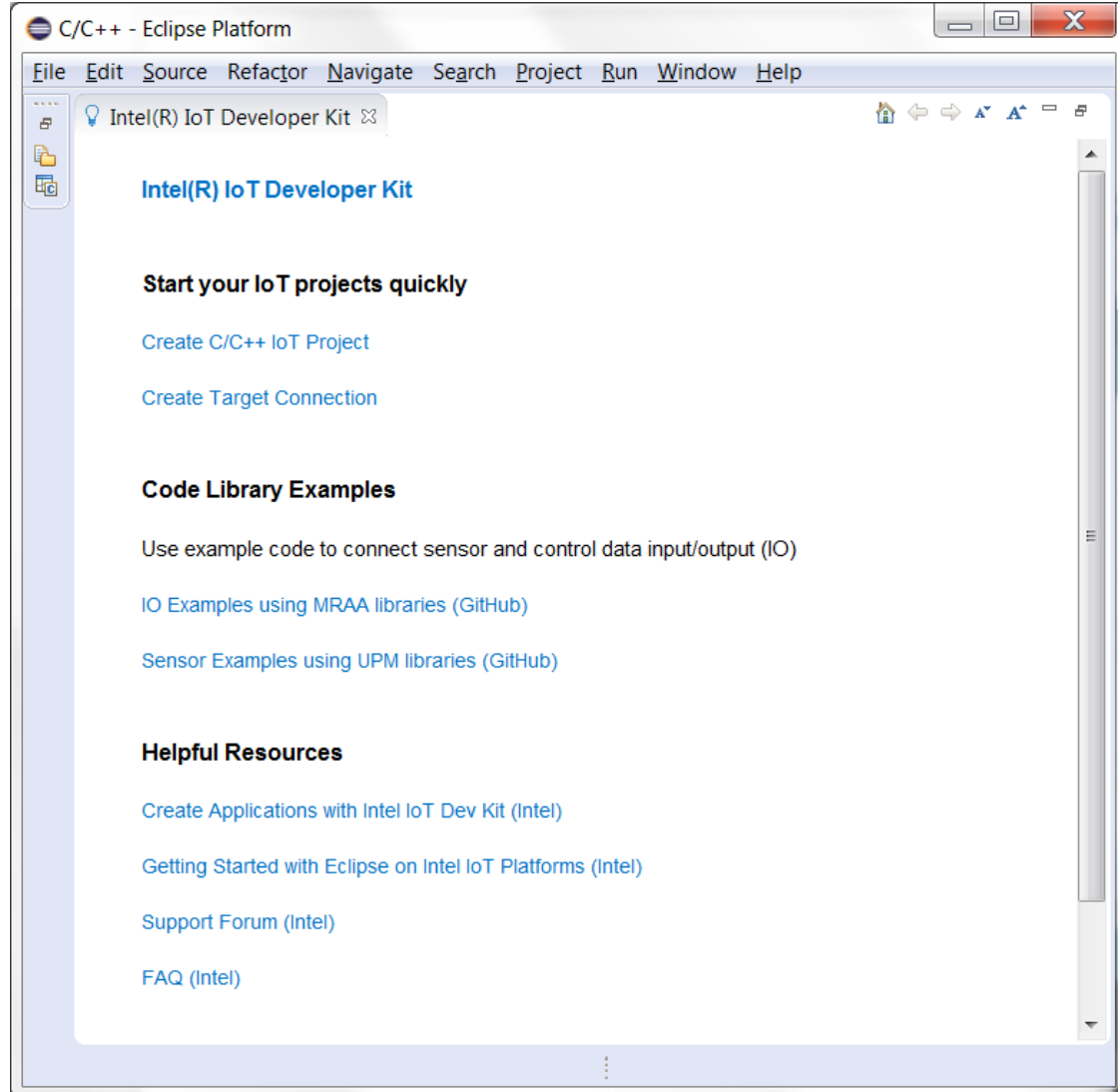
Instalando o arduino

<http://www.arduino.cc/en/Guide/Windows>



Plataforma Eclipse

- Aplicações orientadas a IoT



```
25 #include <unistd.h>
26 #include <signal.h>
27 #include <iostream>
28 #include "adc121c021.h"
29 using namespace std;
30 int shouldRun = true;
31 void sig_handler(int signo)
32 {
33     if (signo == SIGINT)
34         shouldRun = false;
35 }
36 int main(int argc, char **argv)
37 {
38     signal(SIGINT, sig_handler);
39     /*! [Interesting]
40     // Instantiate an ADC121C021 on I2C bus 0
41     upm::ADC121C021 *adc = new upm::ADC121C021(ADC121C021_I2C_BUS,
42         ADC121C021_DEFAULT_I2C_ADDR);
43     while (shouldRun)
44     {
45         uint16_t val = adc->value();
46         cout << "ADC value: " << val << " Volts = "
47             << adc->valueToVolts(val) << endl;
48         usleep(50000);
49     }
50     /*! [Interesting]
51     cout << "Exiting..." << endl;
52     delete adc;
53     return 0;
54 }
```

Programação C/C++

Programação Javascript

```
27 +public class GpioRead6 {
28 + static {
29 +   try {
30 +     System.loadLibrary("mraajava");
31 +   } catch (UnsatisfiedLinkError e) {
32 +     System.err.println(
33 +       "Native code library failed to load. See the chapter on Dynamic Linking Problems in the SWIG Java documentation for help.\n" +
34 +       e);
35 +     System.exit(1);
36 +   }
37 + }
38 + public static void main(String argv[]) {
39 +   mraa.mraa.init();
40 +   mraa.Gpio gpio_in = new mraa.Gpio(6);
41 +   gpio_in.dir(mraa.Dir.DIR_IN);
42 +   System.out.format("Gpio is %d\n", gpio_in.read());
43 + }
44 +}
```



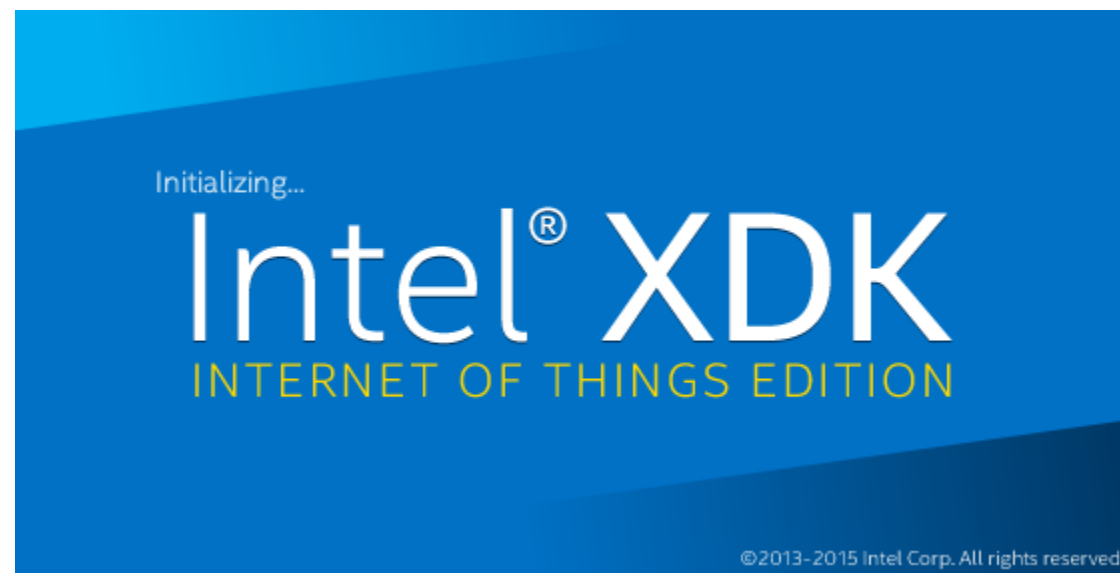
```
24 import time, sys, signal, atexit
25 import pyupm_a110x as upmA110x
27 # Instantiate a Hall Effect magnet sensor on digital pin D2
28 myHallEffectSensor = upmA110x.A110X(2)
31 ## Exit handlers ##
32 # This function stops python from printing a stacktrace when you hit control-C
33 def SIGINTHandler(signum, frame):
34     raise SystemExit
35
36 # This function lets you run code on exit, including functions from
myHallEffectSensor
37 def exitHandler():
38     print "Exiting"
39     sys.exit(0)
41 # Register exit handlers
42 atexit.register(exitHandler)
43 signal.signal(signal.SIGINT, SIGINTHandler)
56 while(1):
47     if (myHallEffectSensor.magnetDetected()):
48         print "Magnet (south polarity) detected."
49     else:
50         print "No magnet detected."
51     time.sleep(1)
```

Programação Phyton

AMBIENTE XDK

“A Ferramenta de Desenvolvimento de Plataforma Cruzada HTML5 Intel® XDK oferece um fluxo de trabalho simplificado para permitir que os desenvolvedores projetem, depurem, criem e implantem com facilidade aplicativos de web híbridos em várias app stores e dispositivos de fator de forma.”

INTEL – 2014 <https://software.intel.com/pt-br/html5/tools>



<https://software.intel.com/pt-br/intel-xdk>

Intel® XDK IoT Edition

XDK PROJECTS Intel XDK IoT EDITION 1912

START A NEW PROJECT

INTERNET OF THINGS EMBEDDED APPLICATION

Templates

Import Your Node.js Project

HTML5 COMPANION HYBRID MOBILE OR WEB APP

+ Templates

+ Samples and Demos

Import Your HTML5 Code Base

OPEN AN INTEL XDK PROJECT

Start your new project from the menu on the left, by choosing a template, sample or demo code base. There are Node.js, Standard HTML5 and HTML5 + Cordova code bases to choose from.

INTERNET OF THINGS NODE.JS PROJECTS

Write a board-embedded application which controls hardware. Use the Intel XDK to install and test your control application on your maker board.

node.js Embed on maker boards

intel Edison intel Galileo

COMPANION HYBRID MOBILE AND WEB APPS

STANDARD HTML5 PROJECT

Choose a template, sample or demo that uses Standard HTML5 APIs to create the most versatile project. Build your project as a packaged web app, host it on a server as an HTML5 web app or build it for distribution through popular mobile app stores.

HTML5 Desktops, smartphones & tablets

Web App Crosswalk Android iOS Windows Chrome OS Firefox OS Tizen

HTML5 + CORDOVA PROJECT

Develop your project specifically as a hybrid mobile app, using Standard HTML5 and Cordova APIs, for distribution through popular mobile app stores.

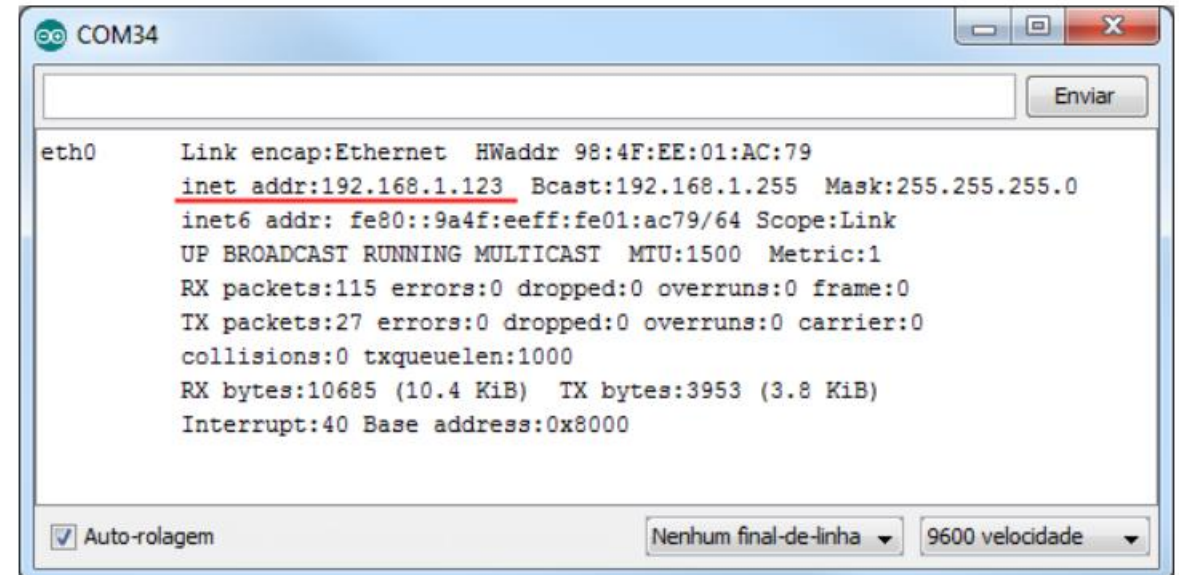
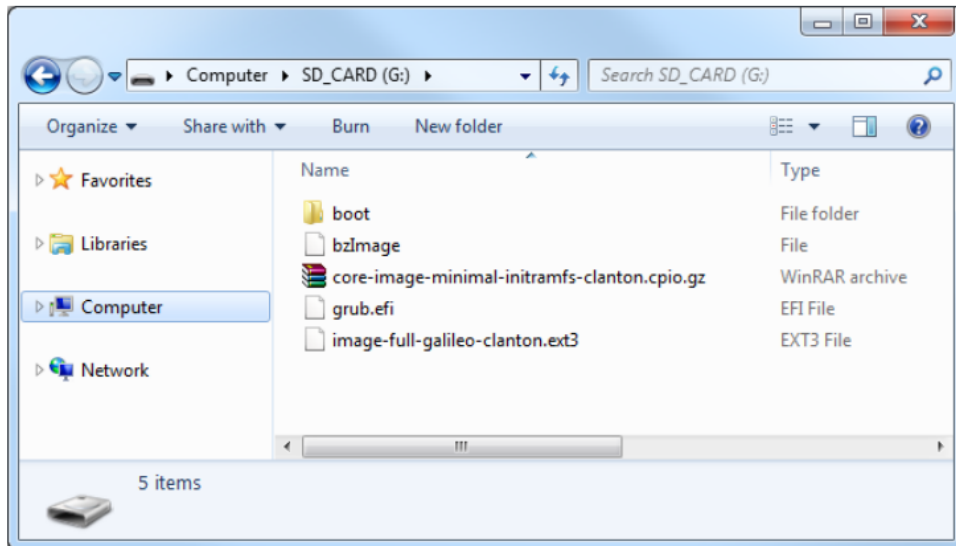
- Utilize data from device sensors, including GPS, accelerometer, compass and more.
- Access device hardware (Bluetooth, NFC, camera, etc.).
- Manage file storage and caching, and access databases like calendar and contacts.
- Explore third-party plugins to find an array of new features.

HTML5 Smartphones & tablets

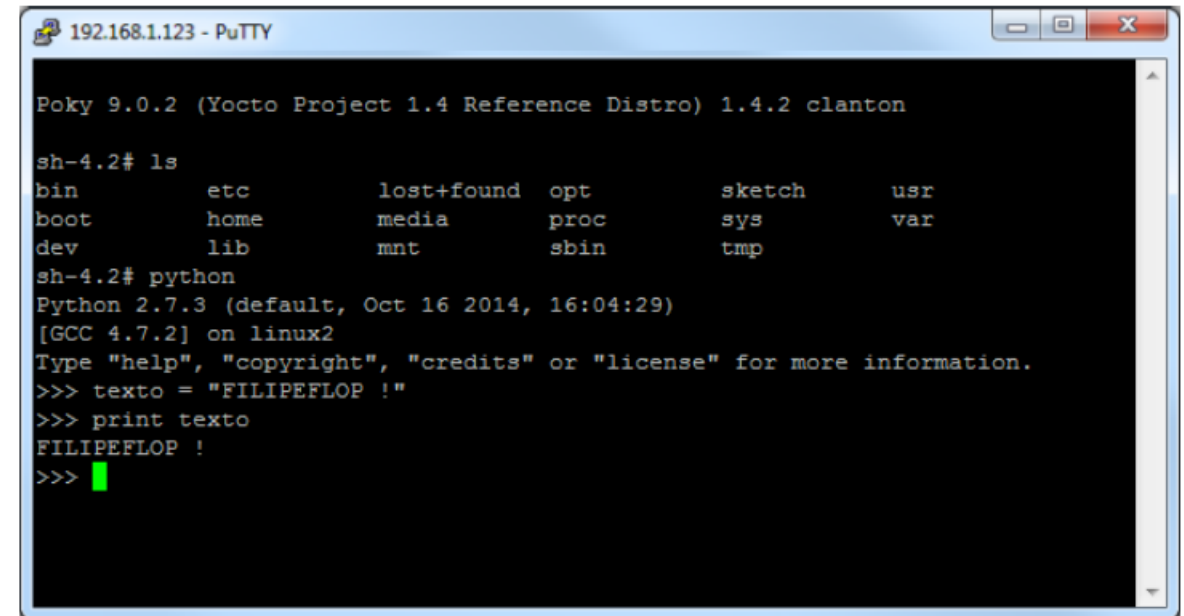
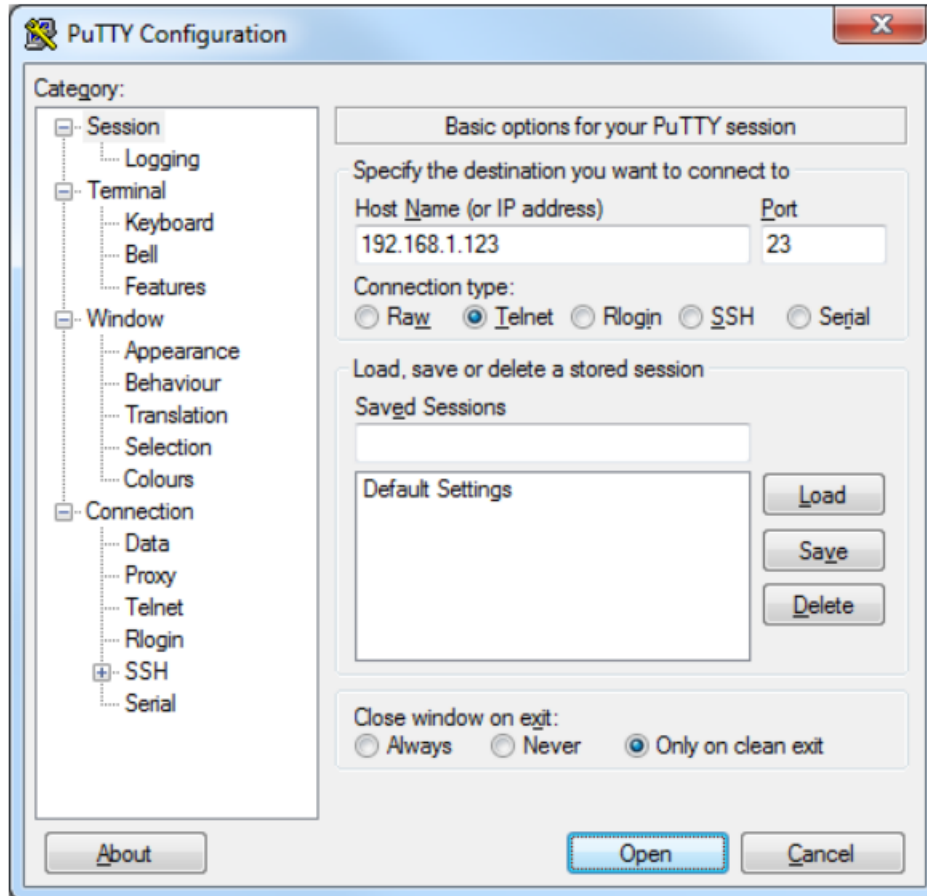
INICIALIZANDO - GALILEO LINUX

Software	File size	File type
SD-Card Linux Image	48 MB	.bz2

```
1 void setup()  
2 {  
3     system("telnetd -l /bin/sh");  
4 }  
5  
6 void loop()  
7 {  
8     system("ifconfig eth0 > /dev/ttyGS0");  
9     sleep(20);  
10 }
```



INICIALIZANDO - GALILEO LINUX



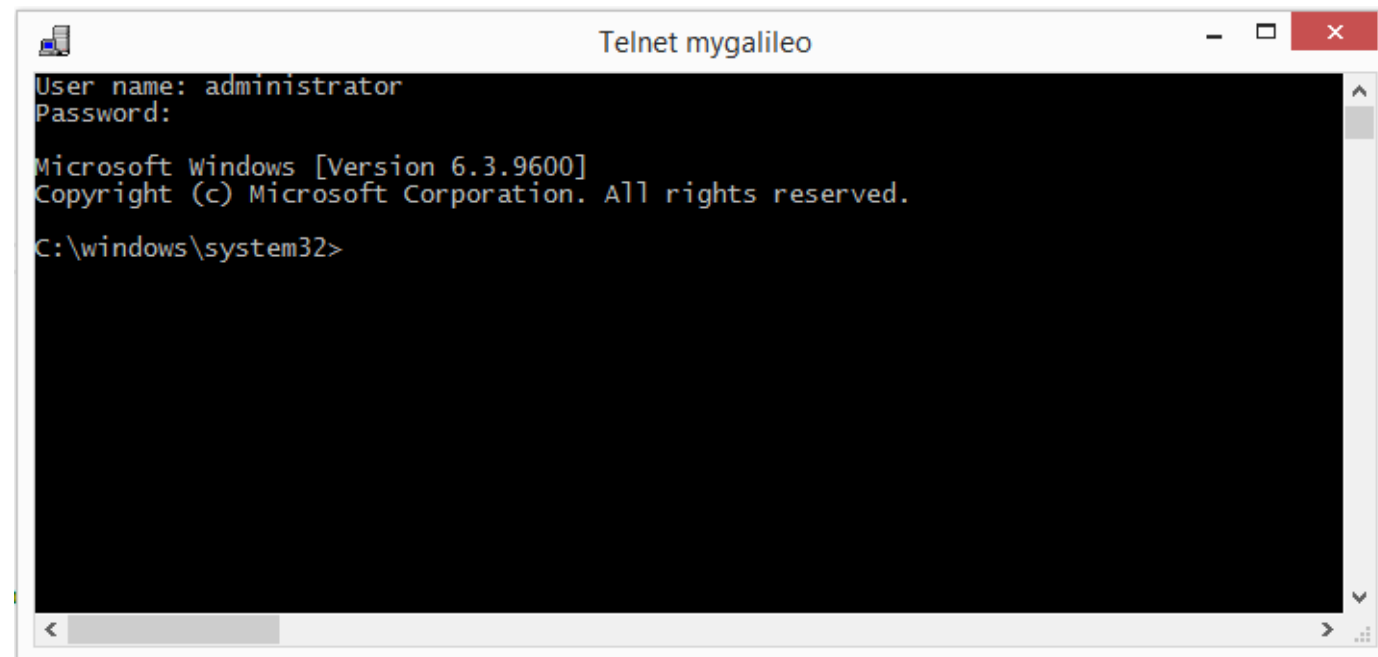
Arquivos no Download:

<input checked="" type="checkbox"/>	Nome do Arquivo	Tamanho do Arquivo	Baixar arquivo único
<input checked="" type="checkbox"/>	apply-BootMedia.cmd	20 KB	Baixar

Arquivos no Download:

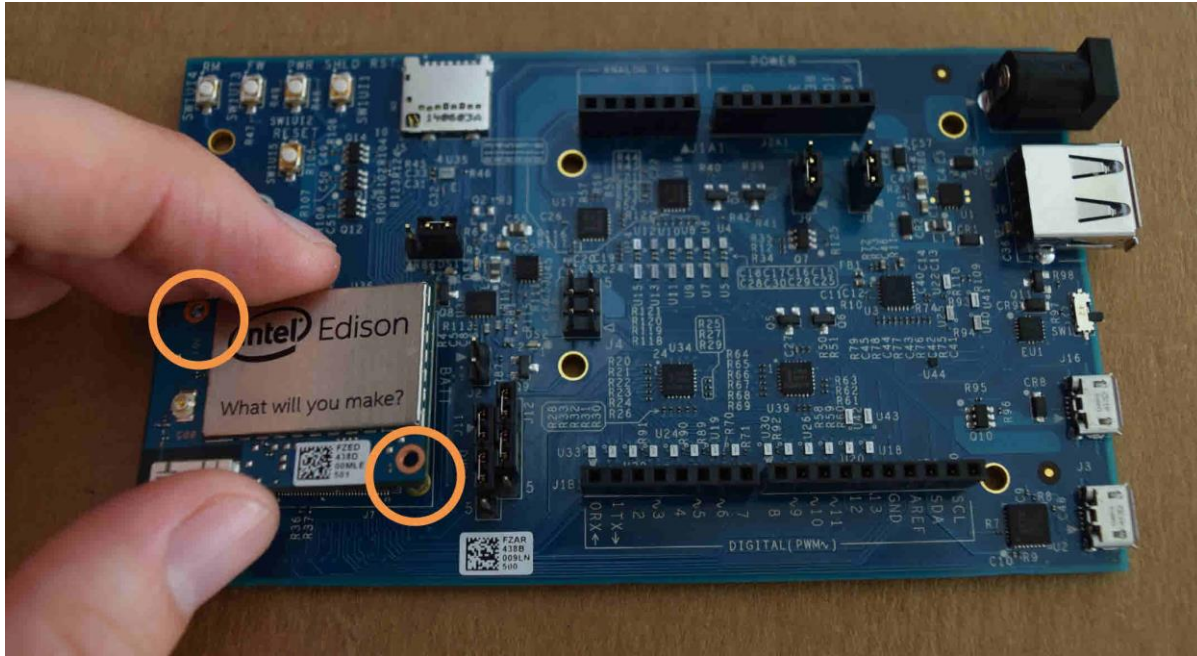
<input checked="" type="checkbox"/>	Nome do Arquivo	Tamanho do Arquivo	Baixar arquivo único
<input checked="" type="checkbox"/>	9600.16384.x86fre.winblue_rtm_iotbuild.150309-0310_galileo_v2.wim	166,77 MB	Baixar

C:\apply-bootmedia.cmd -destination {YourSDCardDrive} -image {.wimFile downloaded above} -hostname mygalileo -password admin



```
Telnet mygalileo
User name: administrator
Password:
Microsoft Windows [Version 6.3.9600]
Copyright (c) Microsoft Corporation. All rights reserved.
C:\windows\system32>
```

INICIALIZANDO – EDISON LINUX



INICIALIZANDO – EDISON LINUX

