FABLAB
LONDON

Intel Edison Course

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Course Outline

- 13th October – Session 1
  - Setting up Edison Board
- 21st October – Session 2
  - Inputs
- 27th October – Session 3
  - Outputs
- 3rd November – Session 4 (with IBM Bluemix)
  - Intro Networking and Cloud services
- 10th November – Session 5(with IBM Bluemix)
  - Advanced Networking and Cloud services
- 26th November – Hackathon

WiFi: FabLab-Guest

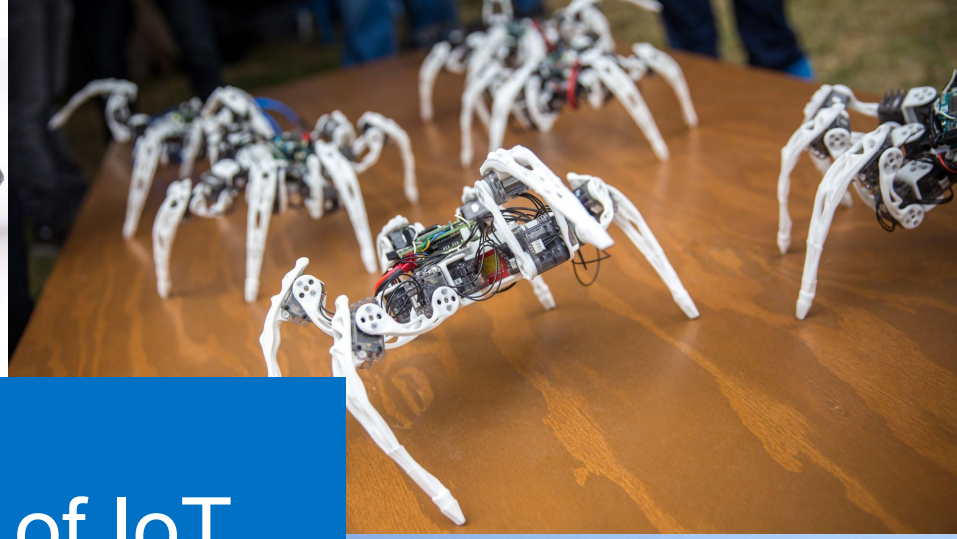
pw: fablab.guest

#fablabedison

Intel® Edison Board

Small, Powerful & Adaptable Hardware

- Dual-core Intel® Atom™ processor 500MHz
- Integrated Wi-Fi*, Bluetooth® Low-Energy (LE)
- 32-bit Intel® Quark™ microcontroller at 100 MHz
- 1 GB of RAM, 4 GB of Storage
- 40 multiplexed GPIO interfaces with expansion board options for total project design and flexibility
- Yocto Project* Linux*



The Story of IoT

Elements of IoT

Data Generators

- Sensors
- Actuators

Data Aggregators

- Gateways to connect disparate protocols
- Data reduction
- Format conversion

Cloud Services

- Long term storage
- Analytics
- Security

Decision

- Command & Control
- User Interface

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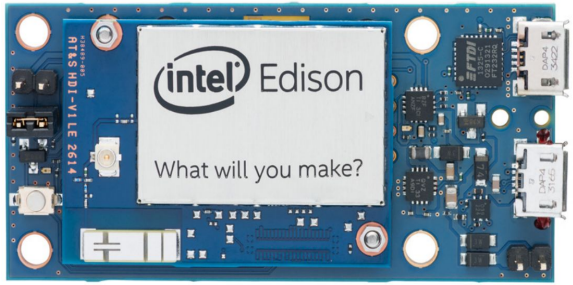
Intel extension Boards

Intel® Edison

- 70 pin connector
- Hirose DF40 Series
- Easy to build your own board

Intel currently offers 2 boards

- Breakout Board
- Arduino* expansion board

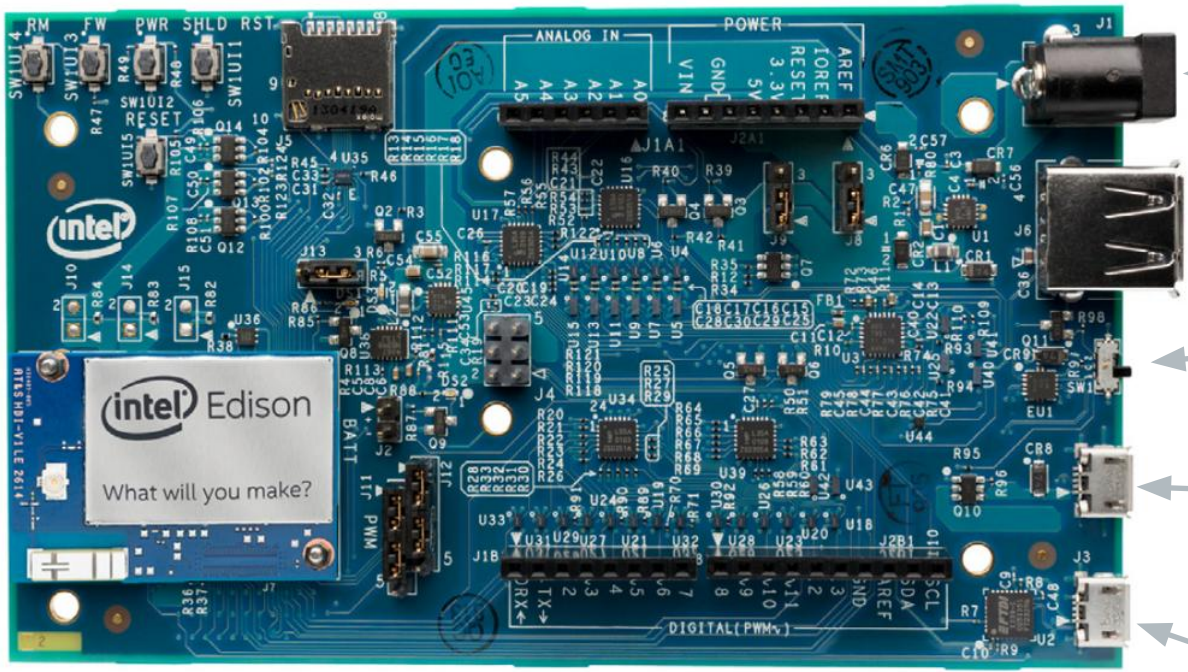


Intel® Edison Development Board with Arduino*

- 20 digital input/output pins including
- 4 pins as PWM outputs
- 6 analog inputs
- 1 UART (RX/TX)
- 1 I2C input connector
- 1 ICSP 6-pin header (SPI)

Connect to your Edison board

what are connectors/cables for ?



Barrel (7V-15V) DC power connector

Standard size USB – Host mode for
- Mouse
- Keyboard
- webcam

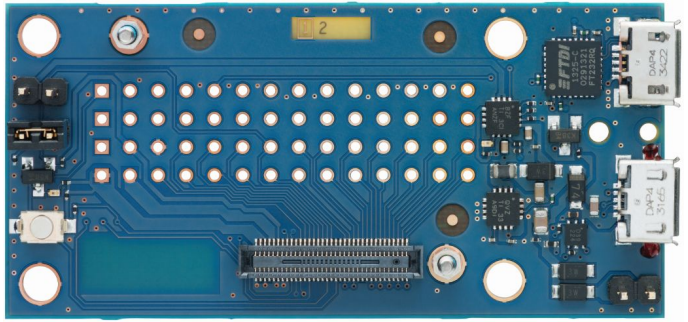
Host / device mode switch

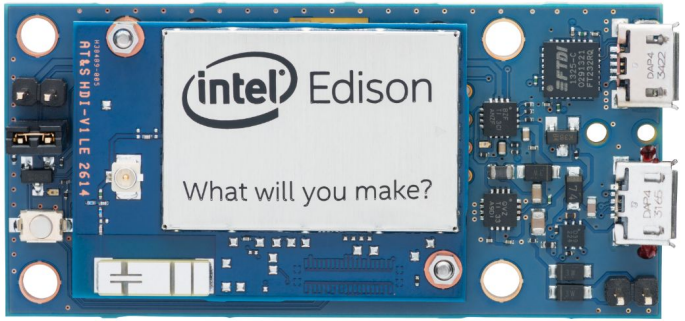
Device mode micro USB for :
- 5V power
- Arduino IDE
- Ethernet over USB
- Flash memory

Micro USB for Serial commands to Edison via terminal/putty to :
- Flash firmware
- Configure Edison
- IP address

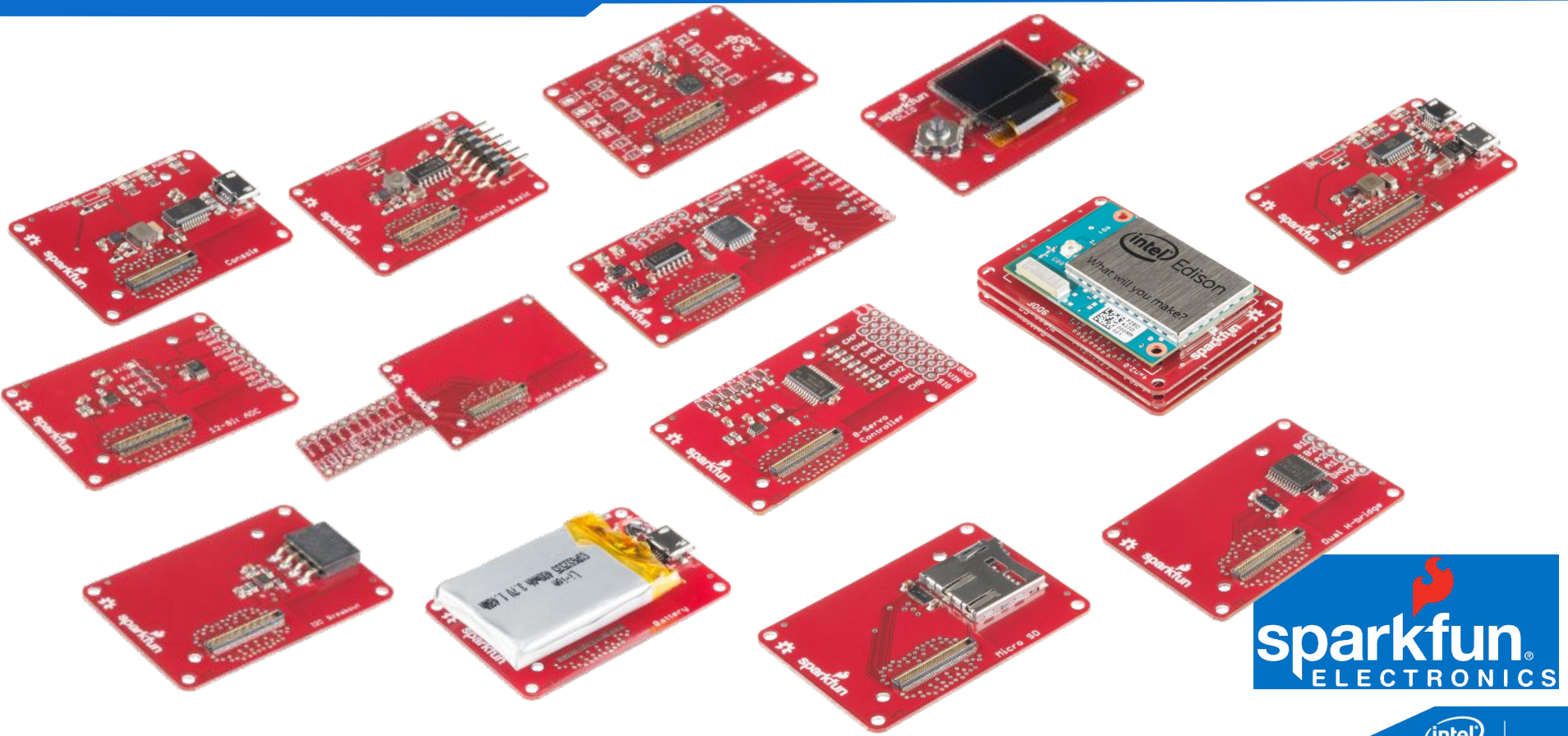
Intel® Edison Breakout Board

- I/O: array of through-hole solder points
- USB OTG with USB Micro (AB)
- Battery charger
- USB micro (B) [UART]
- DC power supply jack (7 to 15 VDC)





Partner Expansion Boards



Let’s get started

General resources

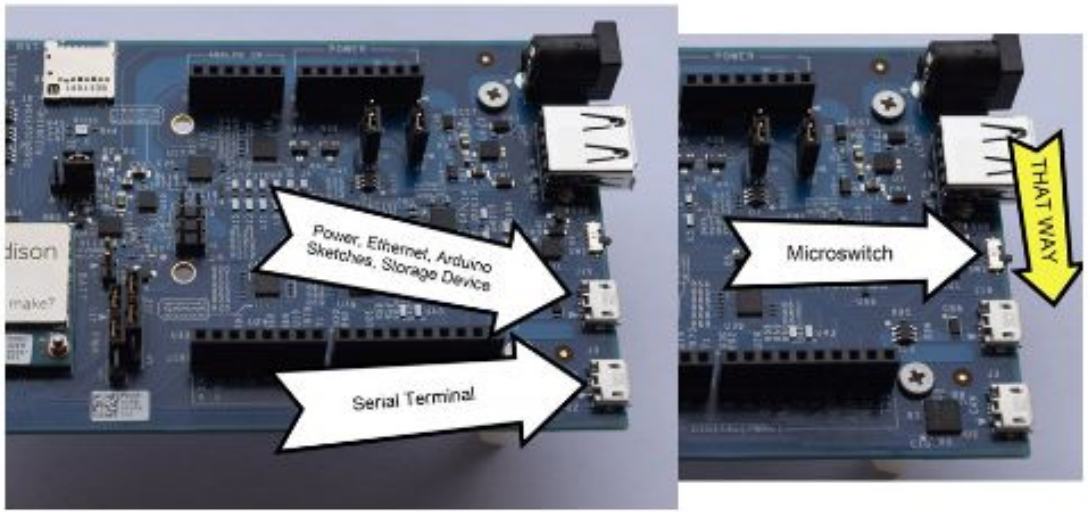
http://www.intel.com/edison/getstarted

-Guides, Documentation, Downloads, FAQ, Forum

http://www.instructables.com/id/Intel-Edison-Projects/

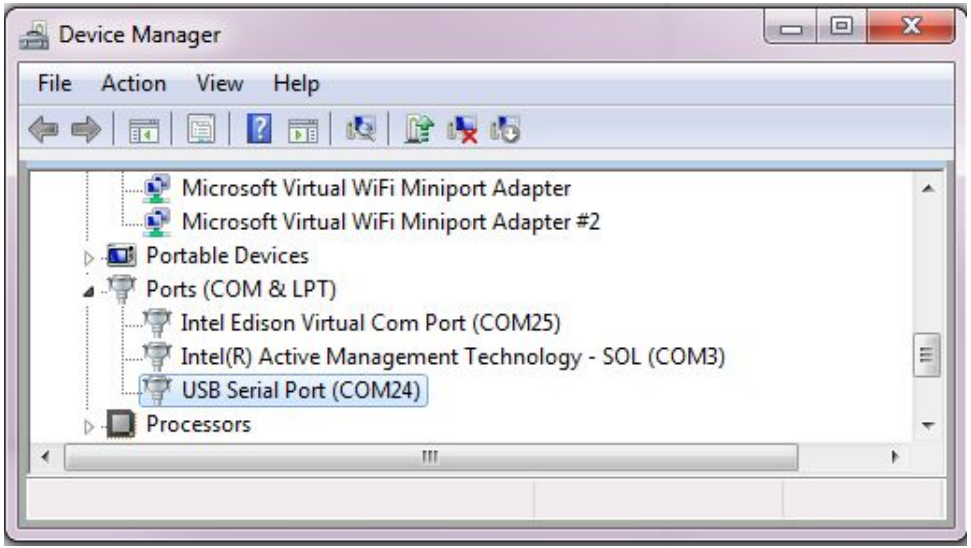
Plugging In – *after board has been flashed with latest firmware*

- Toggle the microswitch towards the two micro-USB slots
- Plug the first micro-USB to the middle slot and the other end to your computer
- Plug the second micro-USB to the outer slot and the other end to your computer



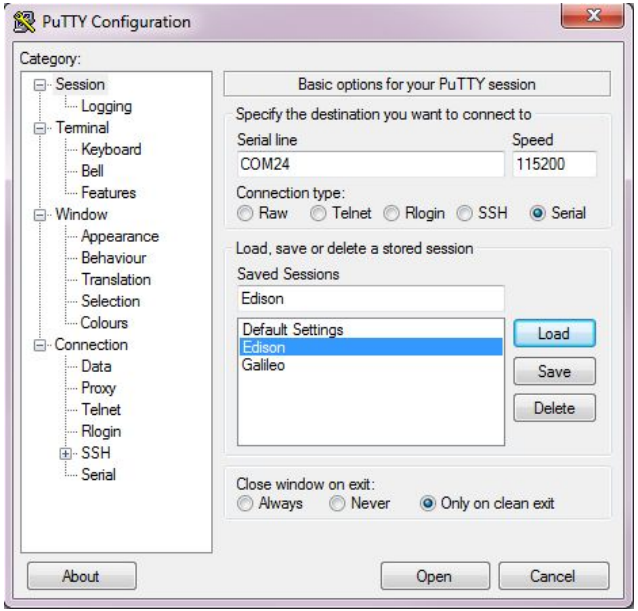
Identify the Serial COM Port

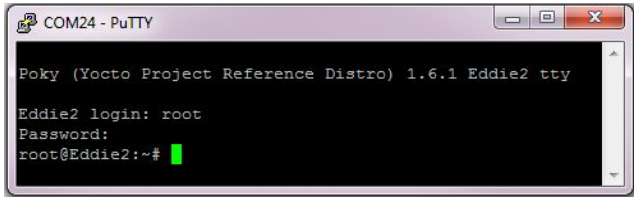
- Open ‘Device Manager’
- Scroll to Ports(COM & LPT)
- Make a note of the COM# for the ‘USB Serial Port’ (Do not use the other two COM ports)



Serial Connection

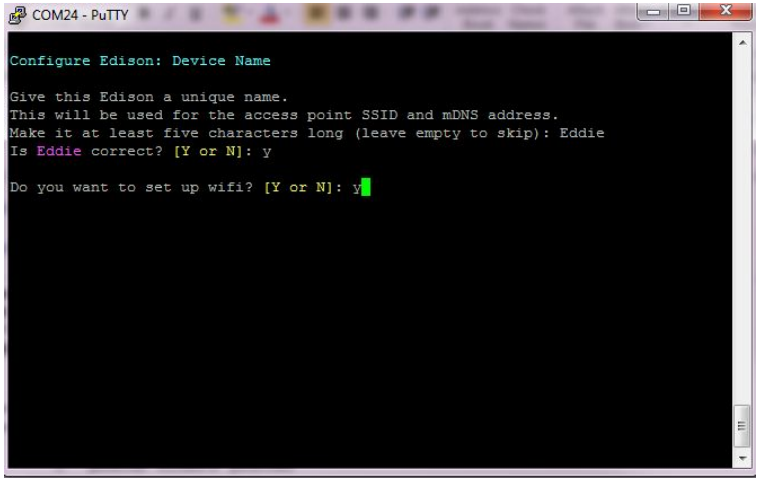
- Open PuTTY
- Select *Connection Type* ‘Serial’
- Enter in the *Serial line* as the Com#
- Enter in the *Speed* 115200
- Enter a name in *Saved Sessions* and click *Save* for later
- Click ‘Open’
- If screen is blank, press Enter
- If there is a wall of text then wait for the board to finish booting up
- Login as ‘root’





Configure the Board

- Type ‘configure_edison --setup’ into the shell
- Enter in a password for the board
- Choose a unique name for your board
  - Will need to be able to identify it easily later
- Confirm the name
- Select ‘y’ and continue to setting up Wi-Fi*



Connecting to Wi-Fi*

- Select your Wi-Fi* network
- Confirm with a ‘y’ and enter
- Enter the network password and wait for it to connect

```
root@Eddie2:~# configure_edison --wifi

Configure Edison: WiFi Connection

Scanning: 1 seconds left

0 :     Rescan for networks
1 :     Exit WiFi Setup
2 :     Manually input a hidden SSID
3 :     TSNOfficeWLAN
4 :     RSN2OfficeWLAN
5 :     MFE.CORP
6 :     EmployeeHotspot
7 :     Puma_2G_GSTestWW34
8 :     pmipv6_mag2
9 :     Puma_5G_GSTestWW34
10 :    SSG-IPAE


Enter 0 to rescan for networks.
Enter 1 to exit.
Enter 2 to input a hidden network SSID.
Enter a number between 3 to 10 to choose one of the listed network SSIDs: 10
Is SSG-IPAE correct? [Y or N]: y
Password must be between 8 and 63 characters.
What is the network password?: ********
Initiating connection to SSG-IPAE. Please wait...
Attempting to enable network access, please check 'wpa_cli status' after a minut
e to confirm.
Done. Please connect your laptop or PC to the same network as this device and go
 to http://192.168.1.134 or http://Eddie2.local in your browser.
```

Note: To setup Wi-Fi outside of initial setup type: ‘*configure_edison --wifi*’ into the shell.

Connecting to Wi-Fi*

- Type in ‘wpa_cli status’
- Verify ‘wpa_state’ is ‘COMPLETED’ and there is an ‘ip_address’ assigned

```
root@Eddie2:~# wpa_cli status
Selected interface 'wlan0'
bssid=94:10:3e:01:c8:8b
ssid=SSG-IPAE
id=7
mode=station
pairwise_cipher=CCMP
group_cipher=CCMP
key_mgmt=WPA2-PSK
wpa_state=COMPLETED
ip_address=192.168.1.136
p2p_device_address=7a:4b:87:ac:9c:e2
address=78:4b:87:ac:9c:e2
```

Homework

-Flash the latest firmware to your Edison Board (instructions in in
and upload blink sketch with IDE of choice

-Think about a project for Hackathon