BUILD OUR FIRST HARDWARE

HARDWARE WE WILL USE

Linkit One

- **produced by SeeedStudio**

- **An Arduino compatible board with build-in wifi, GPS, GPRS etc.**

- **Based on a smart phone system-on-chip from MediaTek**

Grove sensors

- **designed by SeeedStudio**

- **A common hardware interface for various sensors**

- **Analog, Digital, UART, I2C**

PREPARE OUR DEVELOPMENT

Arduino

- **A name for both its hardware & software**

- **An open design of micro-controller board which support easy inputs / outputs, logics and communication with computer**

- **A standalone IDE (based on Processing) with built-in commands for development**

- **download the Arduino IDE 1.5.8 Beta (as of Nov 2014) from its official page**

- **http://arduino.cc/en/Main/Software**
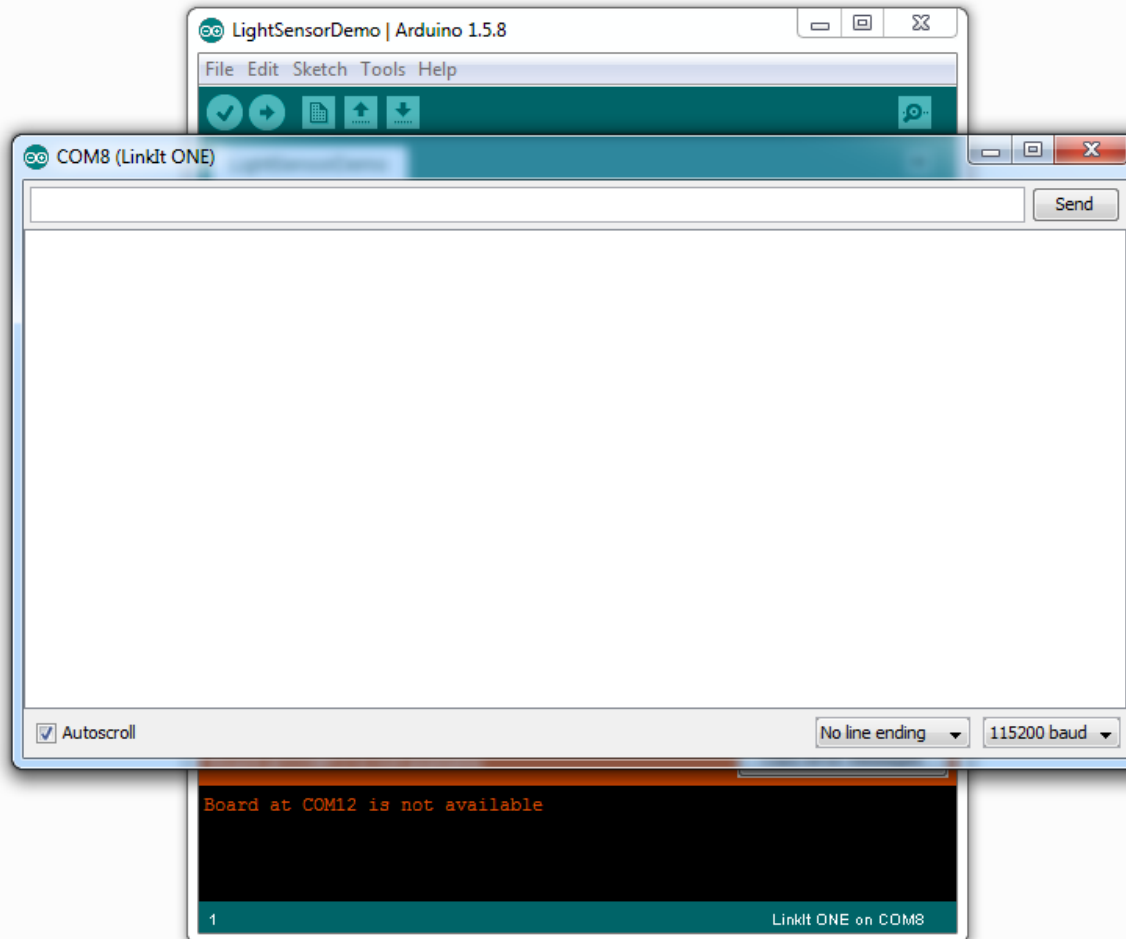
PREPARE OUR DEVELOPMENT

Driver for LinkIt One

- **Join member to Mediatek Labs**

- **Read more about the design**

- **https://labs.mediatek.com/site/global/developer_tools/ mediatek_linkit/whatis_linkit/index.gsp**

ARDUINO IDE
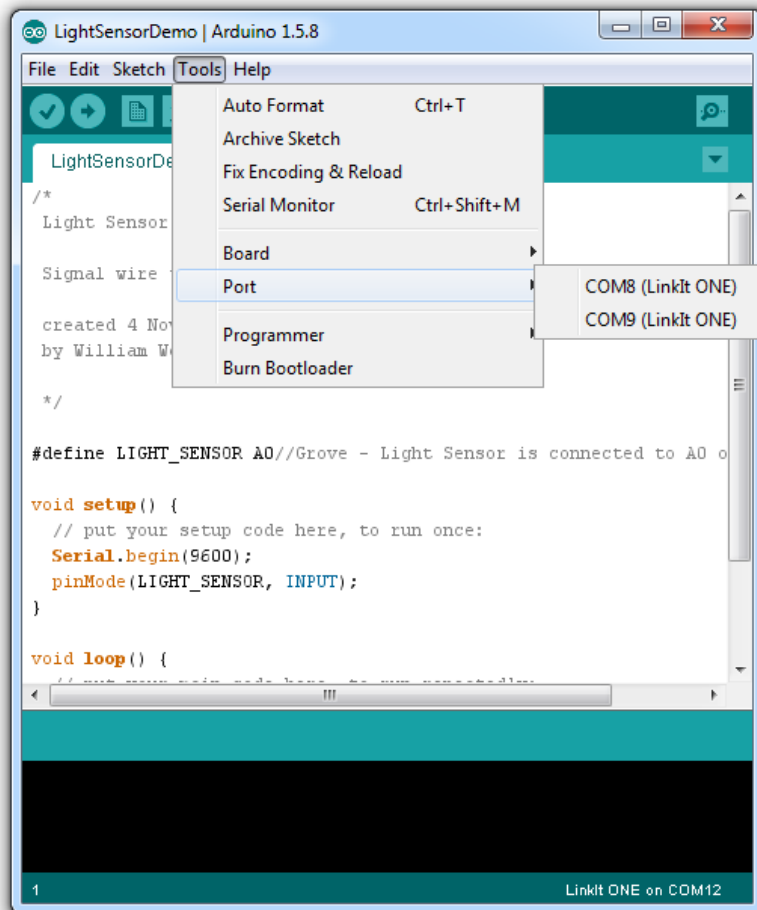
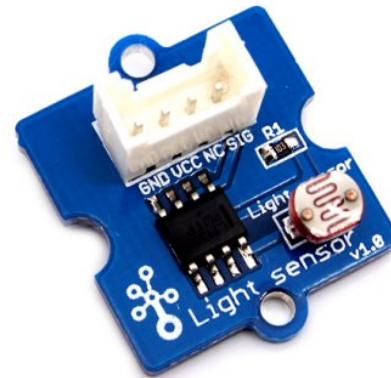# ARDUINO IDE

OUR FIRST BUILD

1. Load sample project at Example > 01. Basics > Blink

2. Make sure your are in the right COM port

3. Upload the file

4. Done !

OUR FIRST BUILD

Read and understand the code

READING BASIC

Let's read some data from a sensor we have,

and we have light

READING BASIC

1. Connecting the base shield

2. Connect the light sensor module to A0

3. Plug the board to computer

4. Download the project file from GitHub

5. Make sure your are in the right COM port

6. Upload the file

7. Done !

WARNING

NEVER DO ANY OF THE FOLLOWING

1. Connecting more than VCC (typically 5V) to any of the I/O pin

2. Overload any I/O pin (e.g. driving a motor directly or connecting to a LED without resistor)

3. Shorting a VCC or HIGH to GND

4. Change connections while powered

SENSOR TYPES

- **Light sensor: Analog**

- **Sound sensor: Analog**

- **Touch sensor: Digital**

- **Barometer : I2C**

- **3-axis Accelerometer : I2C**

- **UV sensor: Analog**

- **Dust sensor : Digital**

ANALOG & DIGITAL

What is Analog

- **Something with states other than 1 or 0**

- **Smooth transitions**

- **Typically means voltage value in range of GND to VCC**

- **Sampled from 0 to 1023**

What is Digital

- **With only HIGH state or LOW state, ON or OFF**

- **Switchs**

- **PWM (Pulse width modulation)**

UART & I2C

UART

- Common communication between systems

- Often used in serial comminication, such as RS-232, RS-422, RS485

I2C

- Common communication between integrated circuits

- Support serial of devices connected together with addressing

CONNECTING TO THE INTERNET

1. Connecting the Wi-Fi antenna

2. Plug the board to computer

3. Download the project file from GitHub

4. Make sure your are in the right COM port

5. Upload the file

6. Done !

CONNECTING TO THE INTERNET

POST /points.json HTTP/1.1

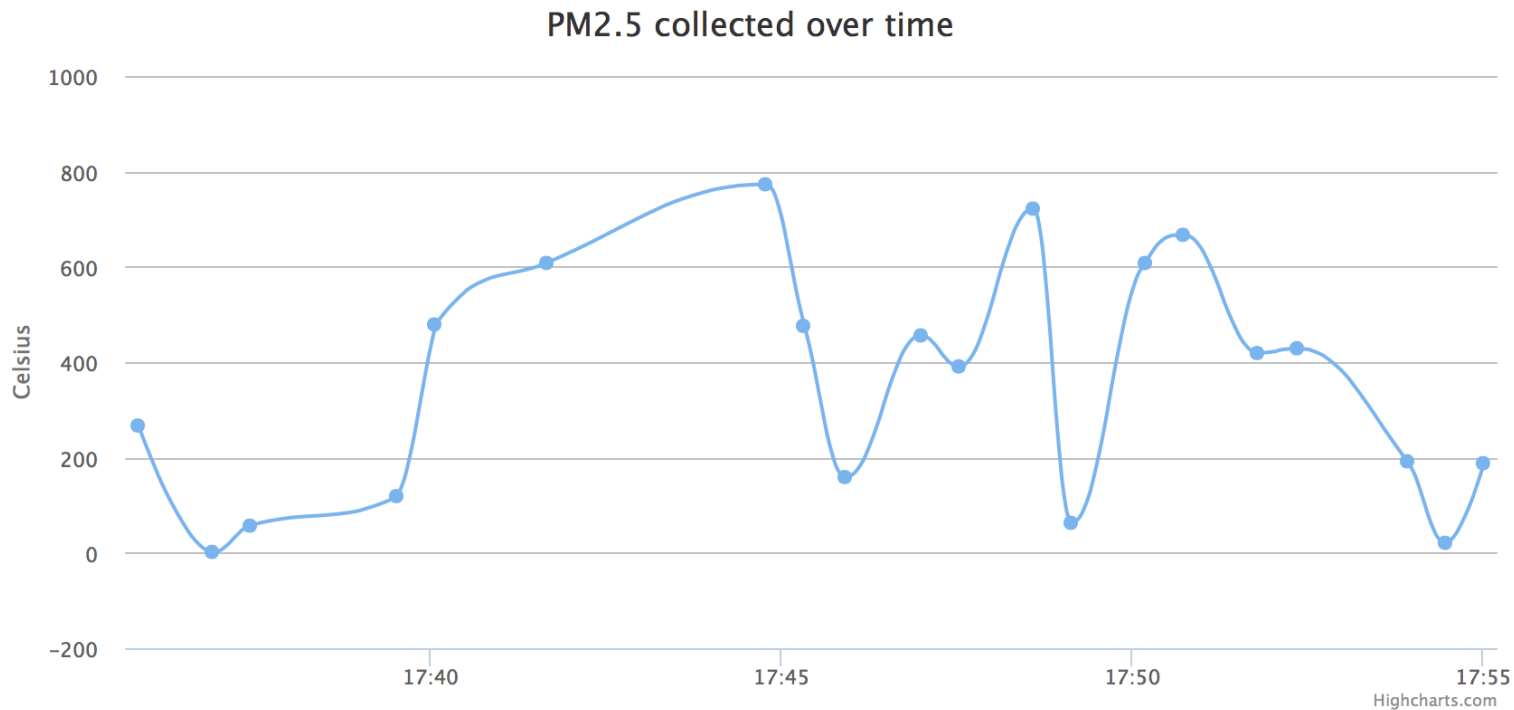Host: cuhk-air-quality.herokuapp.com

Cotent-Type: application/json

Content-Length: 43

Cache-Control: no-cache

{"temperature":"23", "pm25":234, "group":"1"}

CONNECTING TO THE INTERNET

Read dynamic changes at,

http://cuhk-air-quality.herokuapp.com/

PM2.5 collected over time

GRAND UNIFICATION

Measuring Temperature & PM2.5 and upload to our server

1. Use Barometer module and Dust module

2. Download reference project from GitHub

3. Compose your own POST target

4. Make sure your are in the right COM port

5. Upload the file

6. Done !

GRAND UNIFICATION

Read and understand the code

EXPERIMENTING YOUR WAY OUT