

Chapter 1

INTRODUCTION TO EDISON

In this guide, we will bring you our newly developed robot kit, the Devastator Tank Mobile Platform, controlled by the Intel® Edison microprocessor with its expansion board, the Romeo for Intel Edison. Romeo for Intel Edison expansion board a multi-purpose, all-in-one development platform based on Intel® Edison processing module and Arduino SoC platform. To get you started, in following sessions, we will help you go through a Step-by-step instruction for setting up the microcontroller and take a quick look of the Devastator Tank Mobile Platform.

Meet Intel® Edison

The Intel® Edison is a powerful microprocessor with integrated Wi-Fi module. Its size is amazingly as small as a postage stamp. With its powerful computing capability and extremely low energy cost (as low as 1W), it's an excellent tool for portable wireless device studying and developing.

Comparing with the first electronic general-purpose computer, the ENIAC, which was as large as 2.4m x 0.9m x 30m and weighed 27 tons, you will definitely be amazed by the improvement brought by our modern technology.

Just as those big events in the time line below, the invention of Intel® Edison may bring us the same amount of excitement.



You are only one step away from your dream!

Before getting started, we would like to present a few applications based on the Intel® Edison series microcontrollers.

Equipped with Intel® Edison microprocessor, even the simplest thing in our daily life can be intelligent. All that need is your imagination.

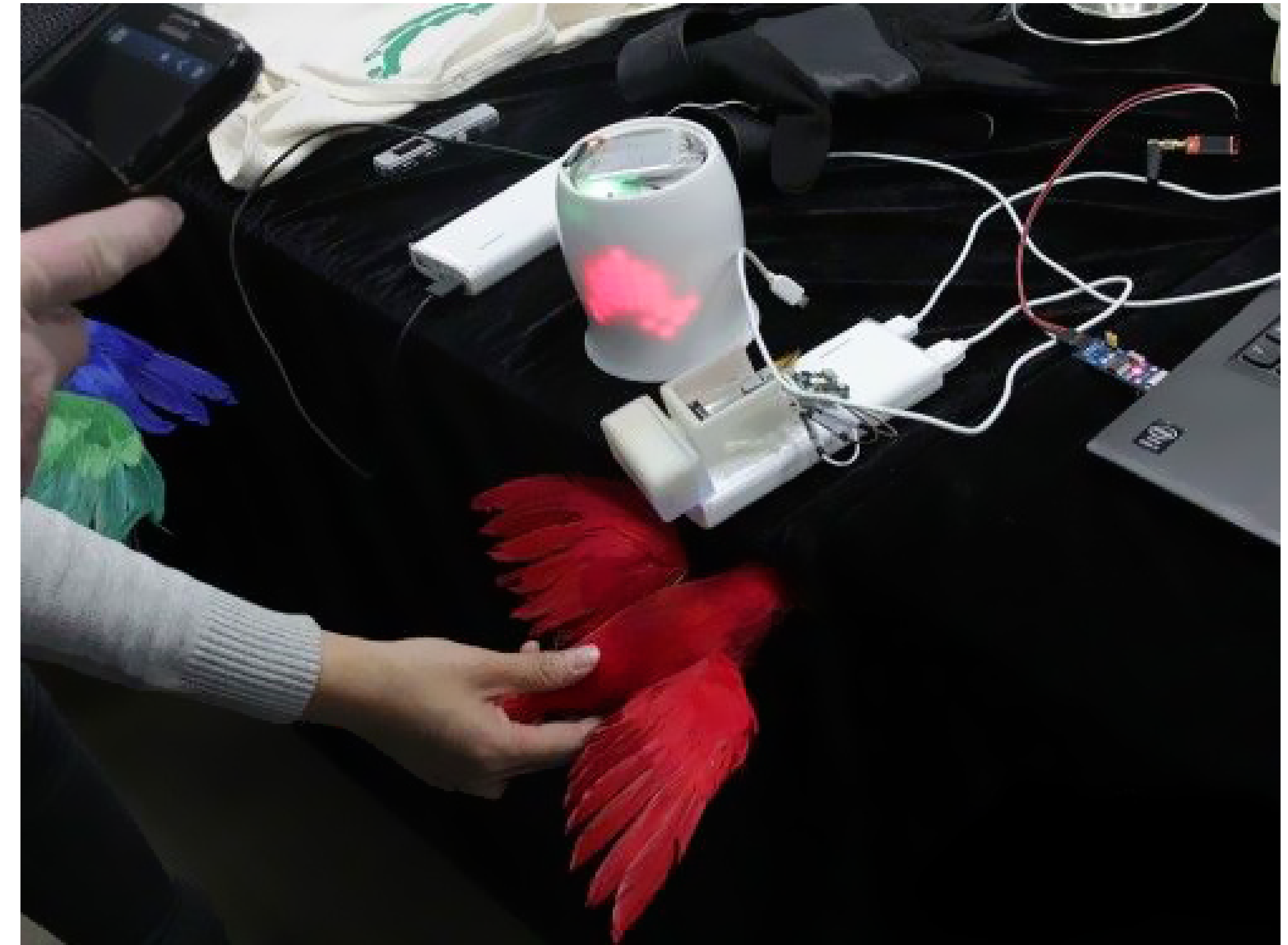
Bring your cup to life!

Wants to interact with your Facebook friends through a cup? Here it is! With a few electronic components and a simple program, this cup is now able to send notifications through its LED indicator when a message pops up on your Facebook page.



Facebook messenger cup

It's the time to challenge your imagination with Intel[®] Edison!



Smart bird feeder

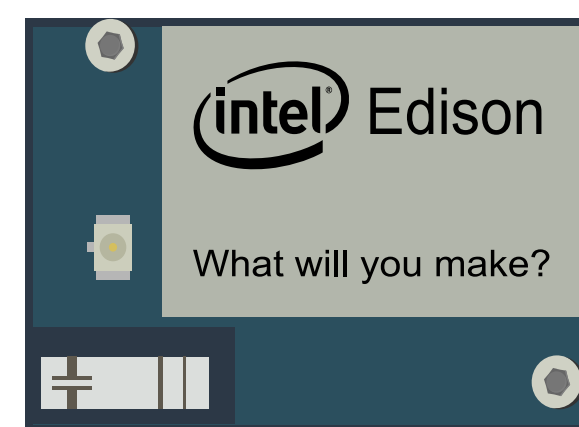
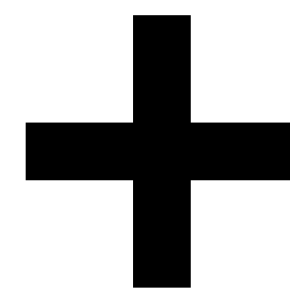
Interact with birds!

Birds get angry about their food? No worries. With the image recognition function powered by the Intel[®] Edison microprocessor, this bird feeder is able to recognize their species and feed them with different types of food. Moreover, by adding more modules, we can even make it to be a weather and temperature indicator and exchange data through a cloud sever.

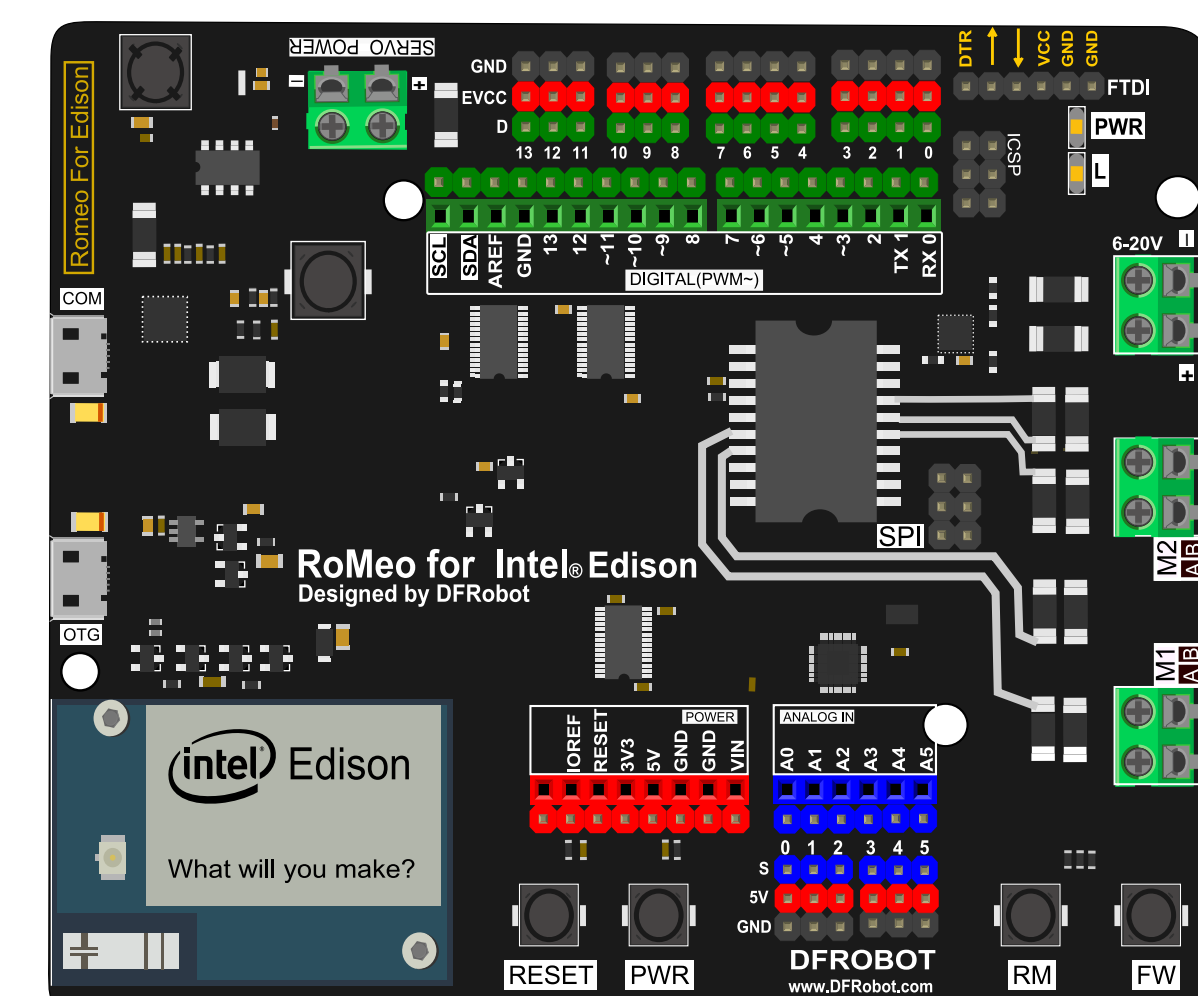
Romeo for Edison

Arduino platform is an open source platform. Due to its simplicity and functionality, it has been widely used in smart device development. Based on Arduino platform, we developed the Romeo for Edison, a more powerful, functional and user friendly expansion board exclusively designed for robotic uses.

The Romeo for Edison micro Expansion board integrates a 2-path motor driving module and a servo driving module in an ID-card sized mother board, which largely simplifies the circuit connection and saves a significant amount of space. Together with its 14 Digital output pins with optional external power supply and 6 analog input pins, building a robot would never be so easy.



Intel® Edison



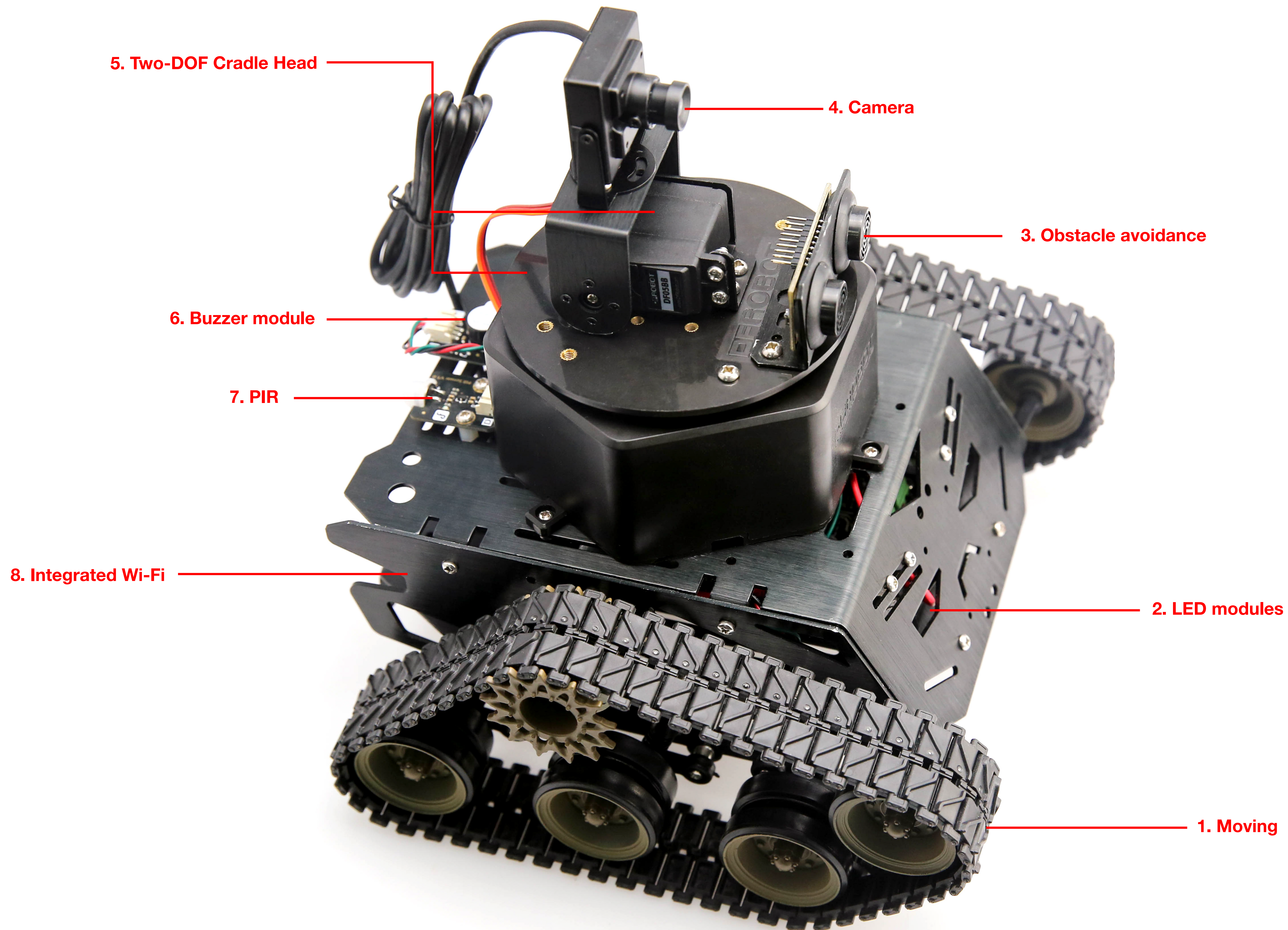
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The Devastator

The Devastator Tank Mobile Platform is a set of robotic kits controlled by the Intel[®] Edison microcontroller. Its outstanding mobility allows it to travel over various terrains. With an ultrasonic distance sensor and a two-DOF cradle head, the Devastator is able to detect and avoid obstacles. Moreover, Equipped with integrated Wi-Fi module, it can be attached to internet and connected to your own devices so that you can control its motion and view the real-time images captured by its camera wirelessly.

1. **Moving** Two-way deceleration motor gives Devastator perfect maneuverability
2. **LED modules** LED modules can be set as light indicators
3. **Obstacle avoidance** Ultrasonic distance sensor allows Devastator can avoid obstacles automatically
4. **Camera** The camera captures real-time images
5. **Two-DOF cradle head** Supports up-down and left-right moving of the camera
6. **Buzzer module** Buzzer module can be set as an audial indicator
7. **PIR** PIR sensor detects people approaching
8. **Integrated Wi-Fi** Integrated Wi-Fi module supports wireless control and video streaming



Installation

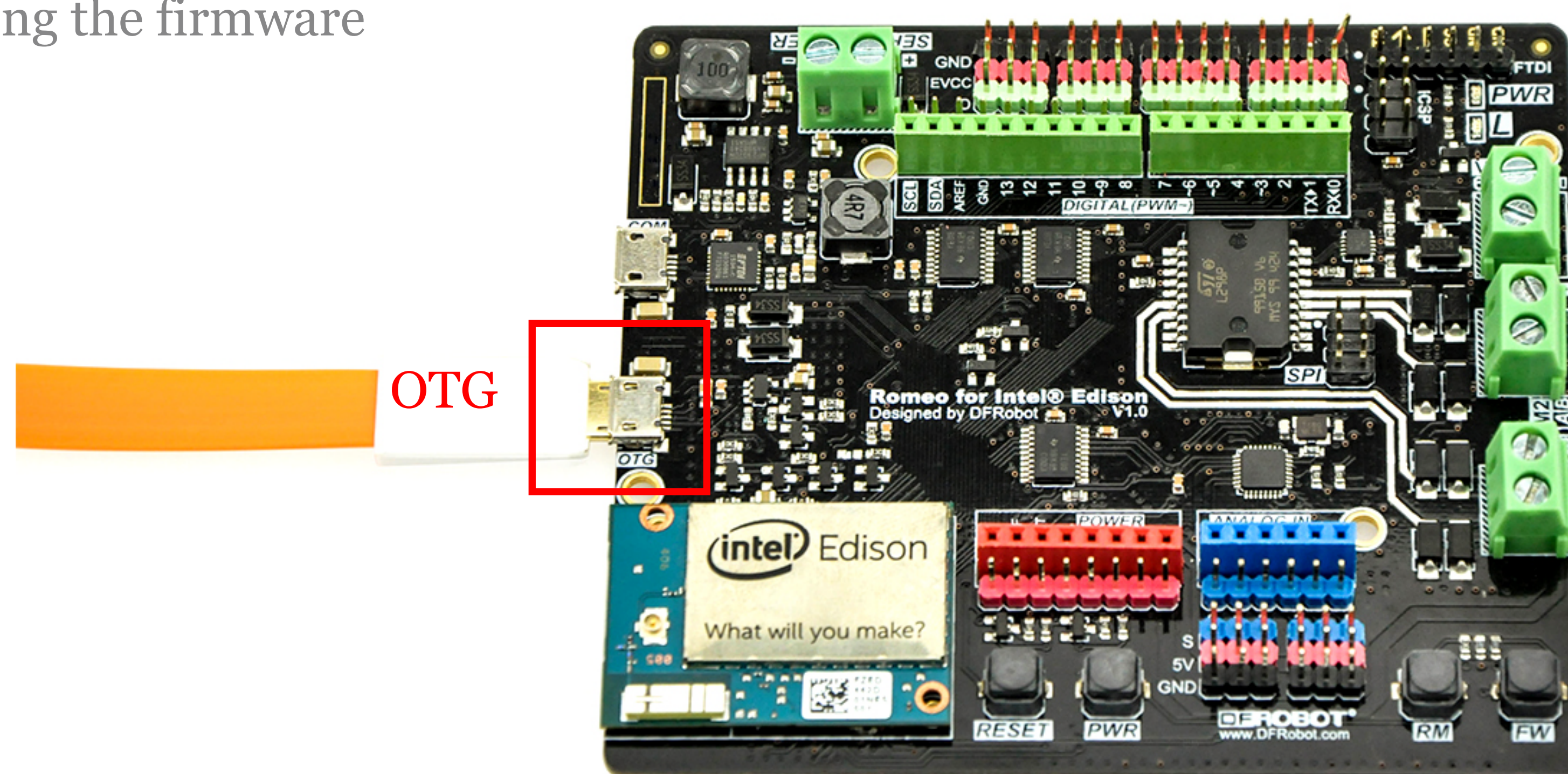
Follow the instructions below to set up your Romeo for Edison microcontroller for first time use.

Connect the board to your computer

Plug the smaller end of a micro-USB cable into the OTG port of the Romeo for Edison extension board.

Note: OTG port can be used for following purposes

- Powering up the board through USB cable
- Uploading Arduino sketches
- Updating the firmware



Plug the other end of the USB cable to your computer.



After the board is connected to your computer, we need to install its driver software.

Install the Intel® Edison Board Software

All your Intel® Edison Board Downloads in One Spot!

Update your development board with firmware and software downloads.

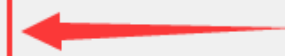
Installers

There is a new integrated Mac* OS X* installer. The installer for Linux* systems is on our road map and will be coming soon. Stay tuned - we've heard your feedback and are working as hard as we can to improve the out-of-box setup experience.

To access the features in the most current Intel® IoT Developer Kit release, always download the latest version of the integrated installer for your system, as follows:

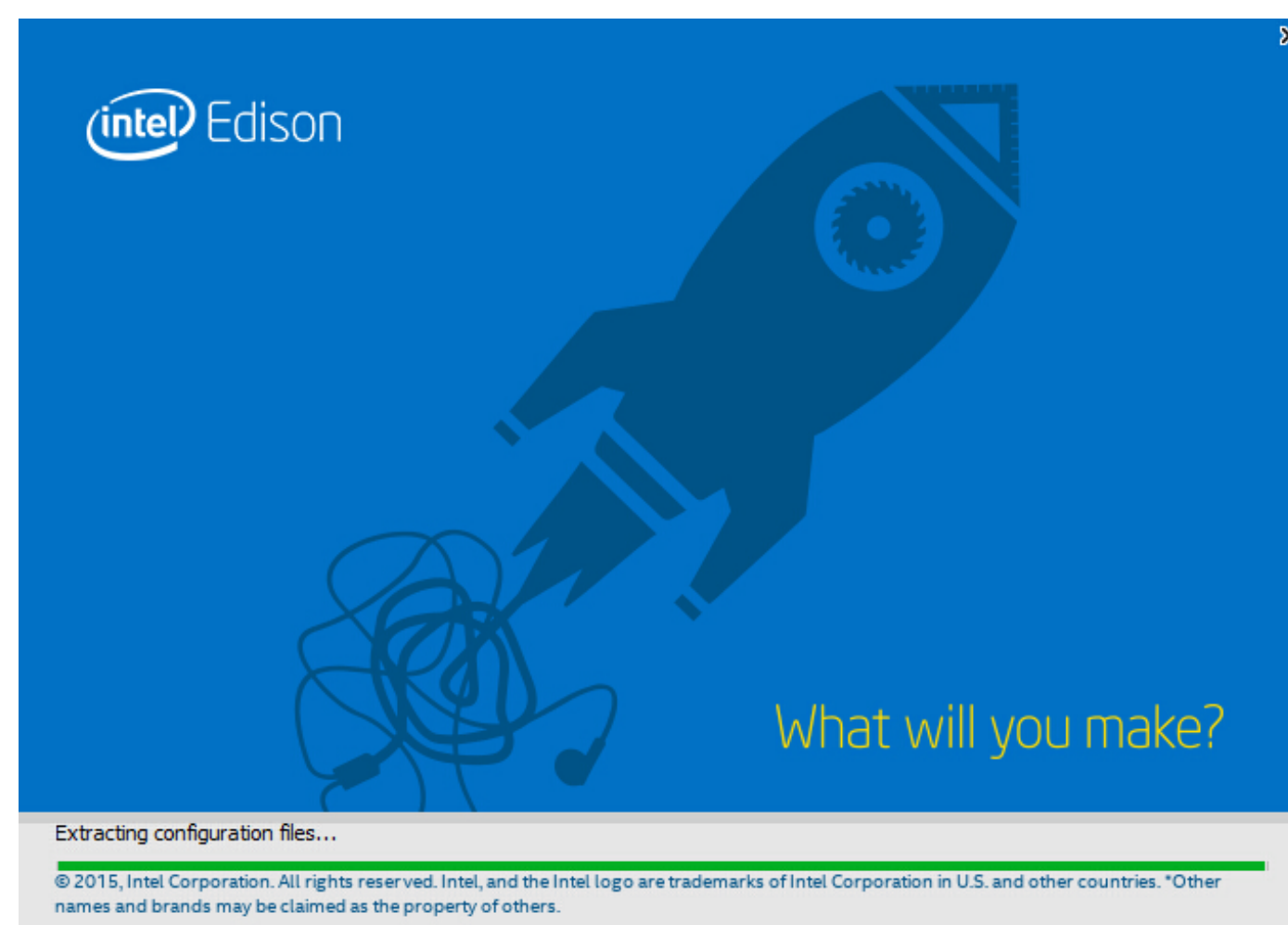
Windows* 64-bit installer

Mac* OS X* installer

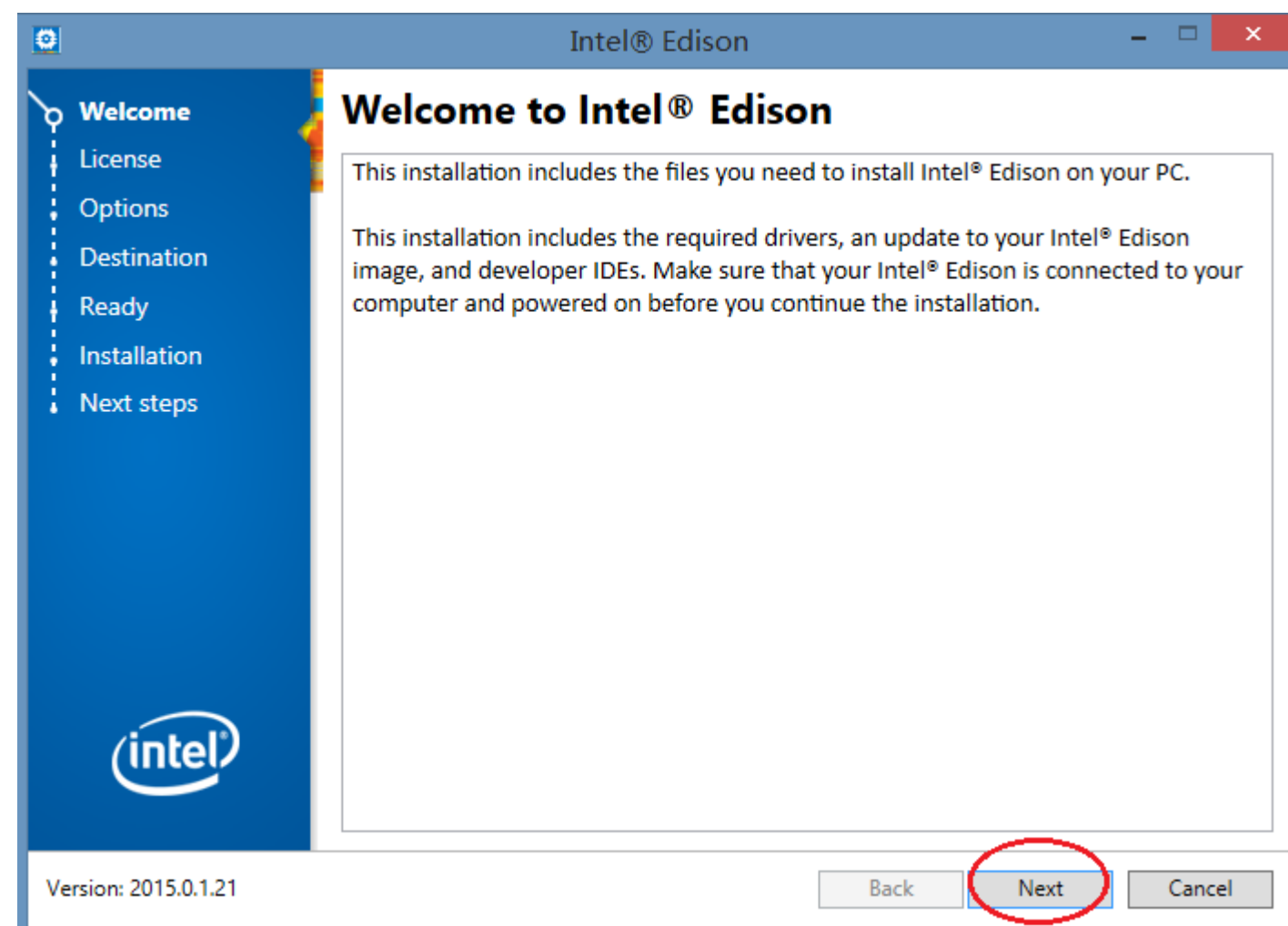


Download the Driver software compatible with your operating system from the Intel website in the link below.

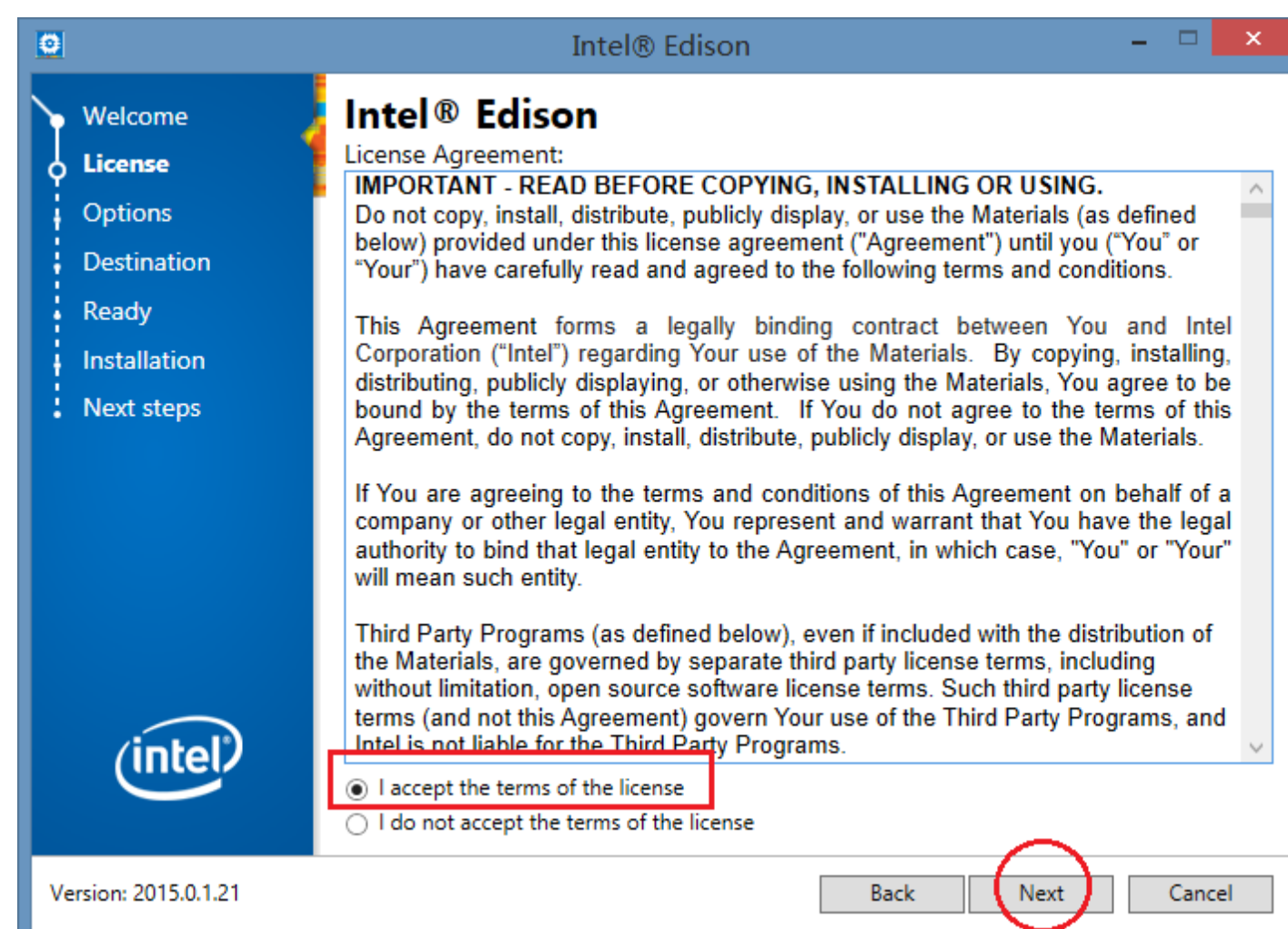
<https://software.intel.com/en-us/iot/hardware/edison/downloads>



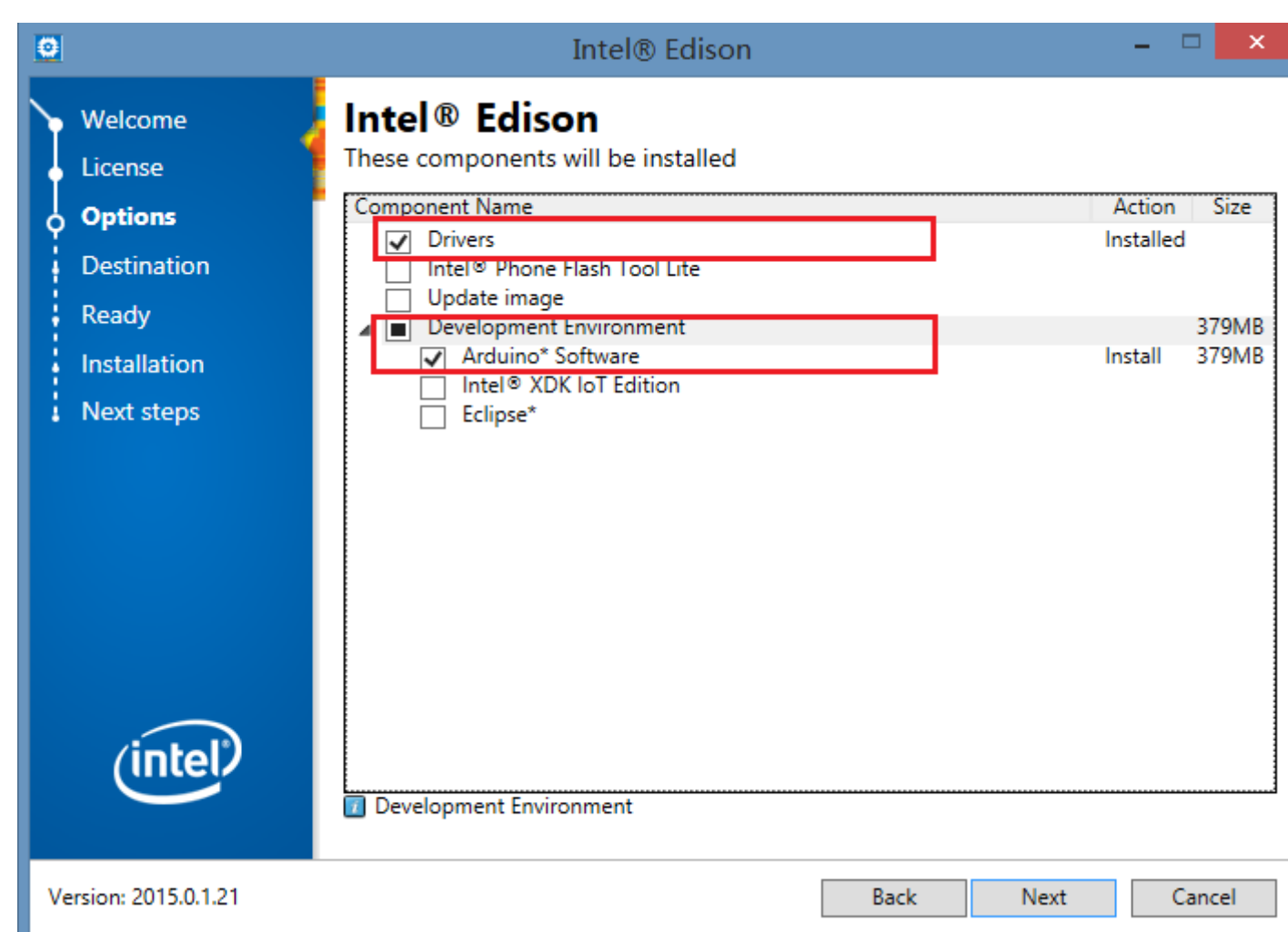
Open the installation package and enter the installation interface.



On the its welcome page, Click **Next**.



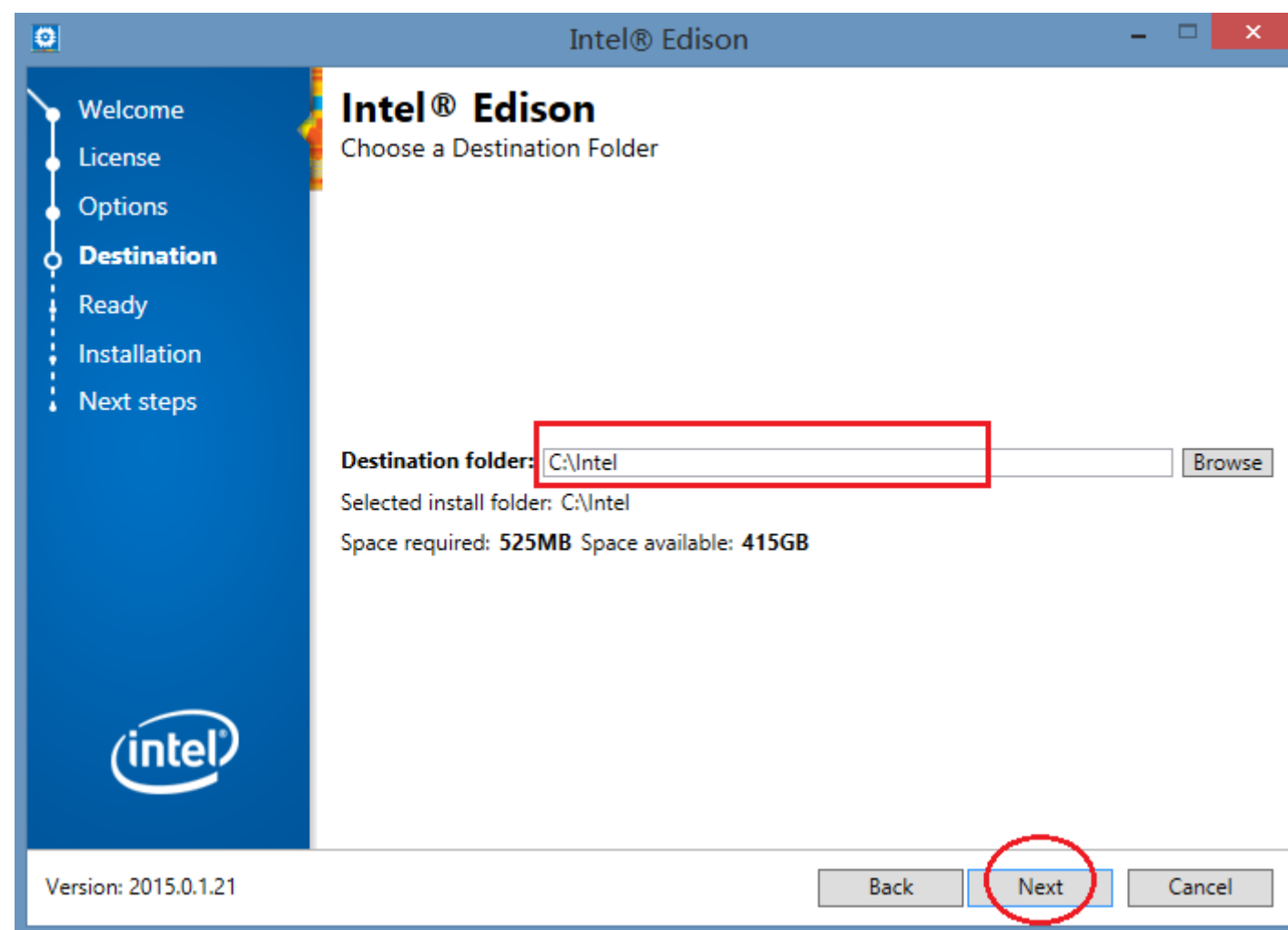
Select “I accept terms of the license” and click **Next**.



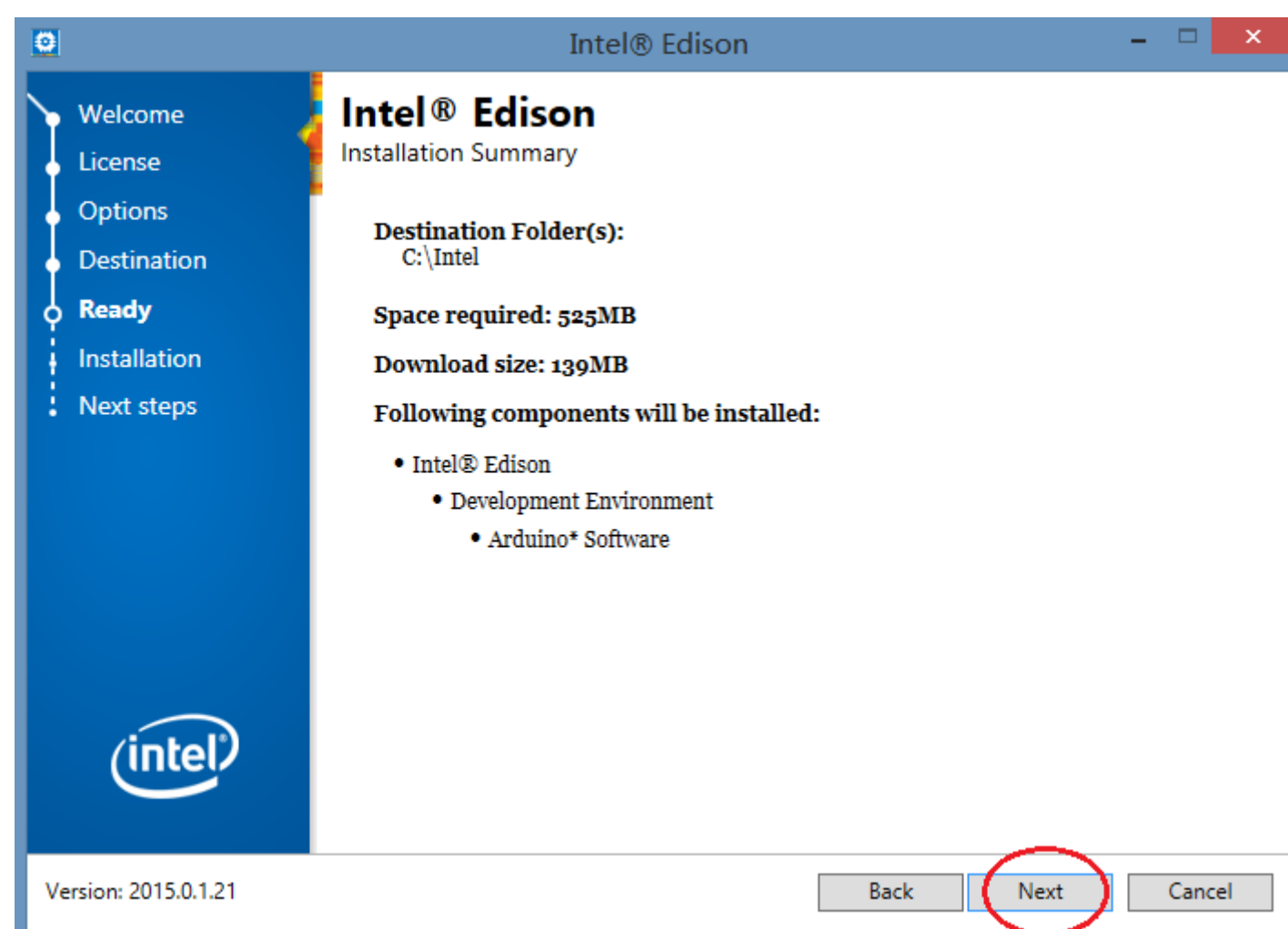
Select “**Driver**” and item “**Arduino* Software**” Under the tag “**Development Environment**”.

Note: if its firmware is needed to be updated, please also select “**Intel Phone Flash Tool Lite**” and “**Update image**”.

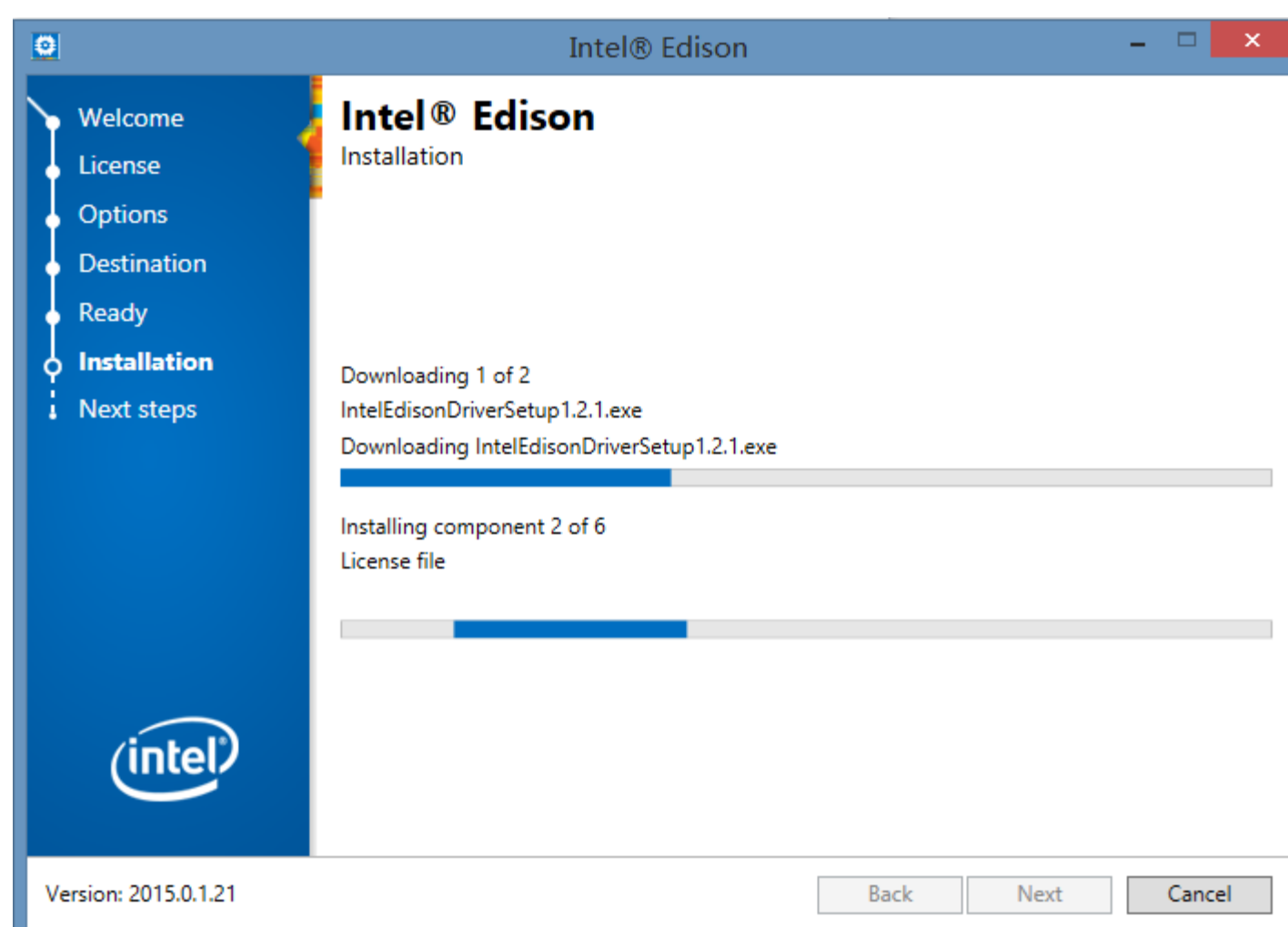
Visit the Intel website in the link below for more information
<https://software.intel.com/en-us/assembling-and-connecting-your-board>



Select destination folder for the software and then select **Next**.



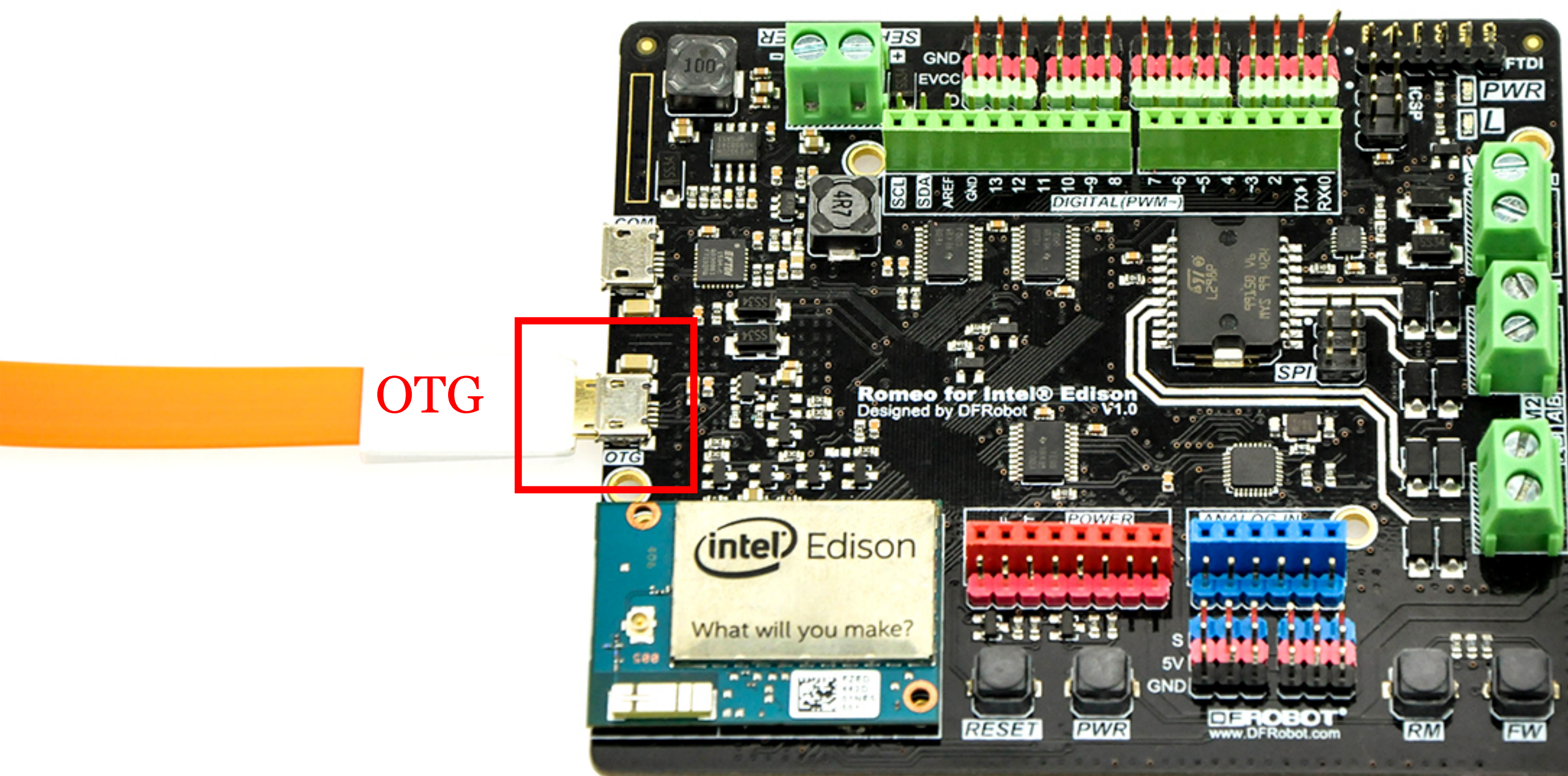
Check the installation summary and click **Next**.



Wait for the program to download and install the interface.



After all installation are complete, click Finish. The driver to you Intel® Edison is now all set!



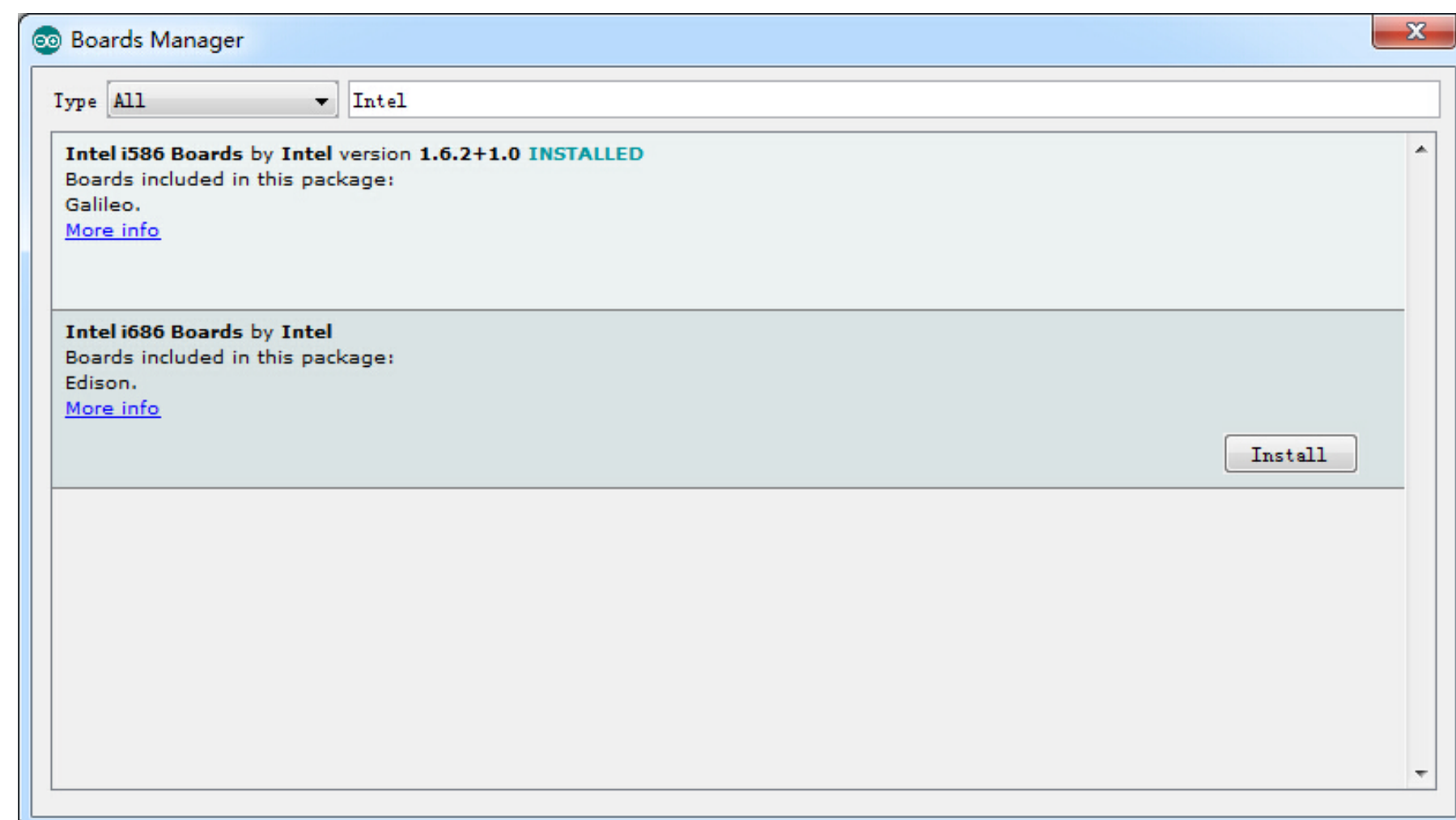
Once the driver has been successfully installed, after connecting a USB cable to the OTG port, you should be able to find the storage icon named “**Edison**” appear in “My Computer” and the entry “**Intel Edison Virtual COM port**” in device manager.



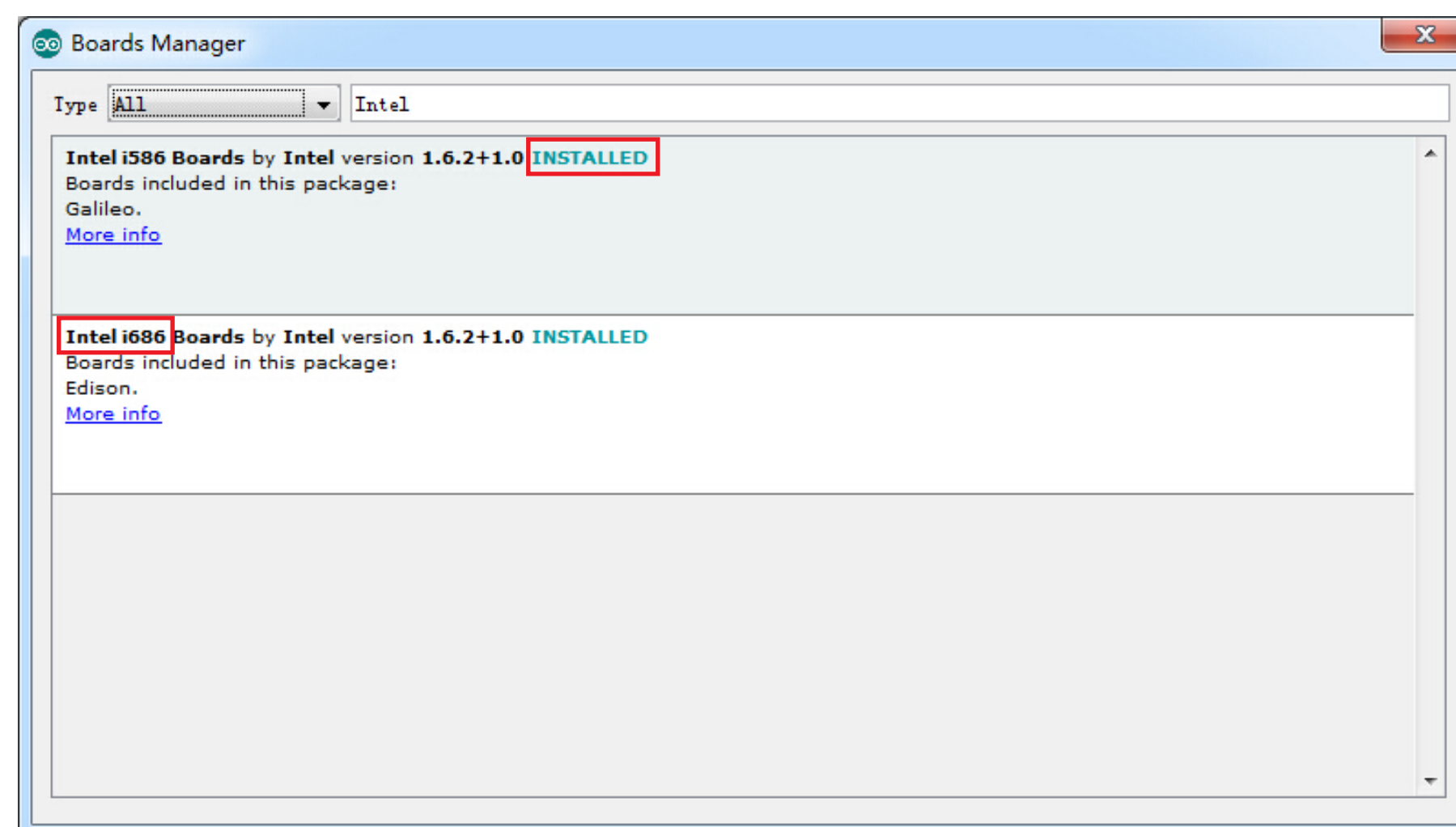


To make your board recognized by your Arduino software, you need to install the driver from **Boards Manager** in your Arduino software.

Go to **Tools > Board** and click **Boards Manager** to open the **Boards Manager** window.

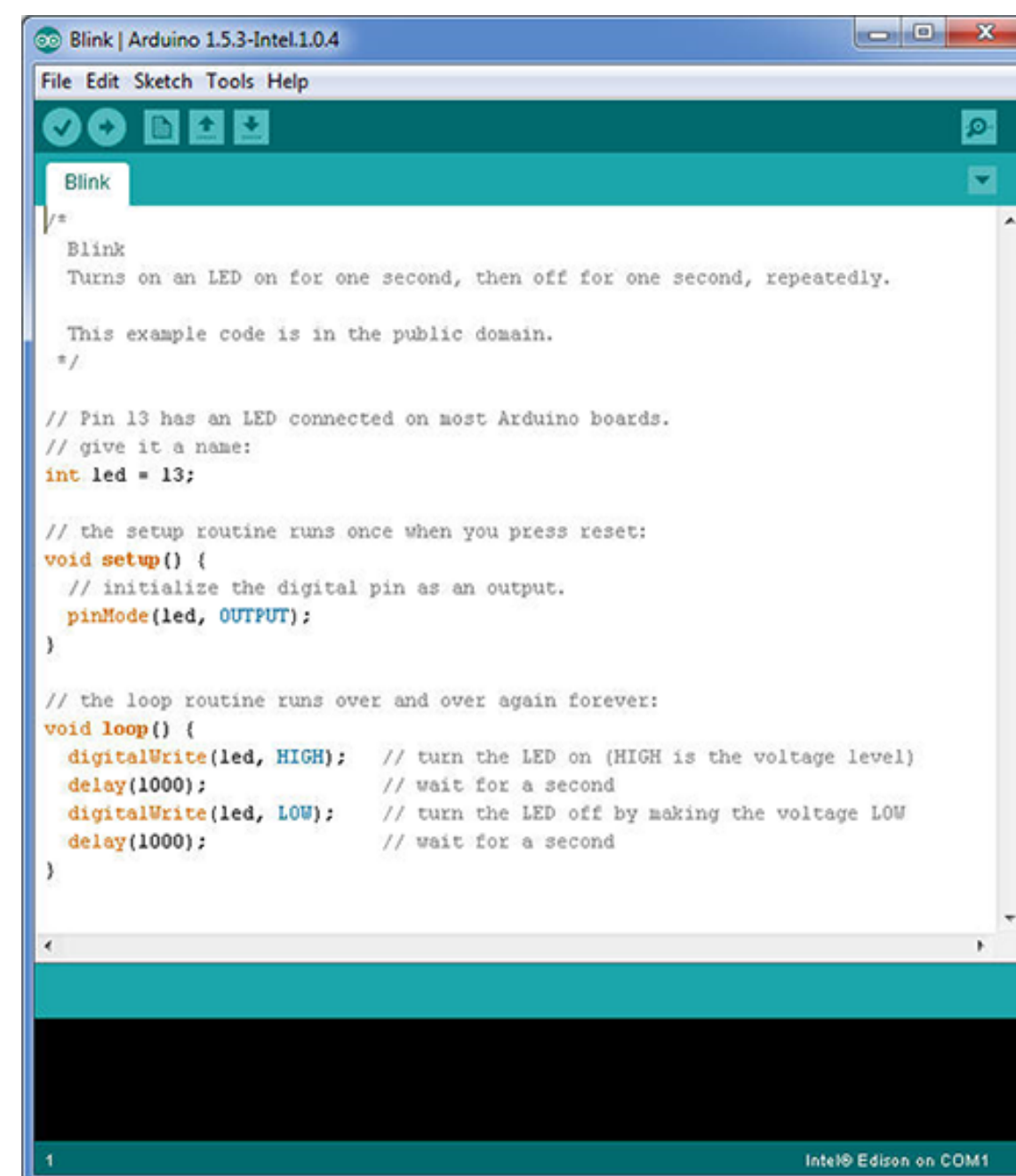


In the **Boards Manager** window, search for **Intel i686** boards and click **Install**.



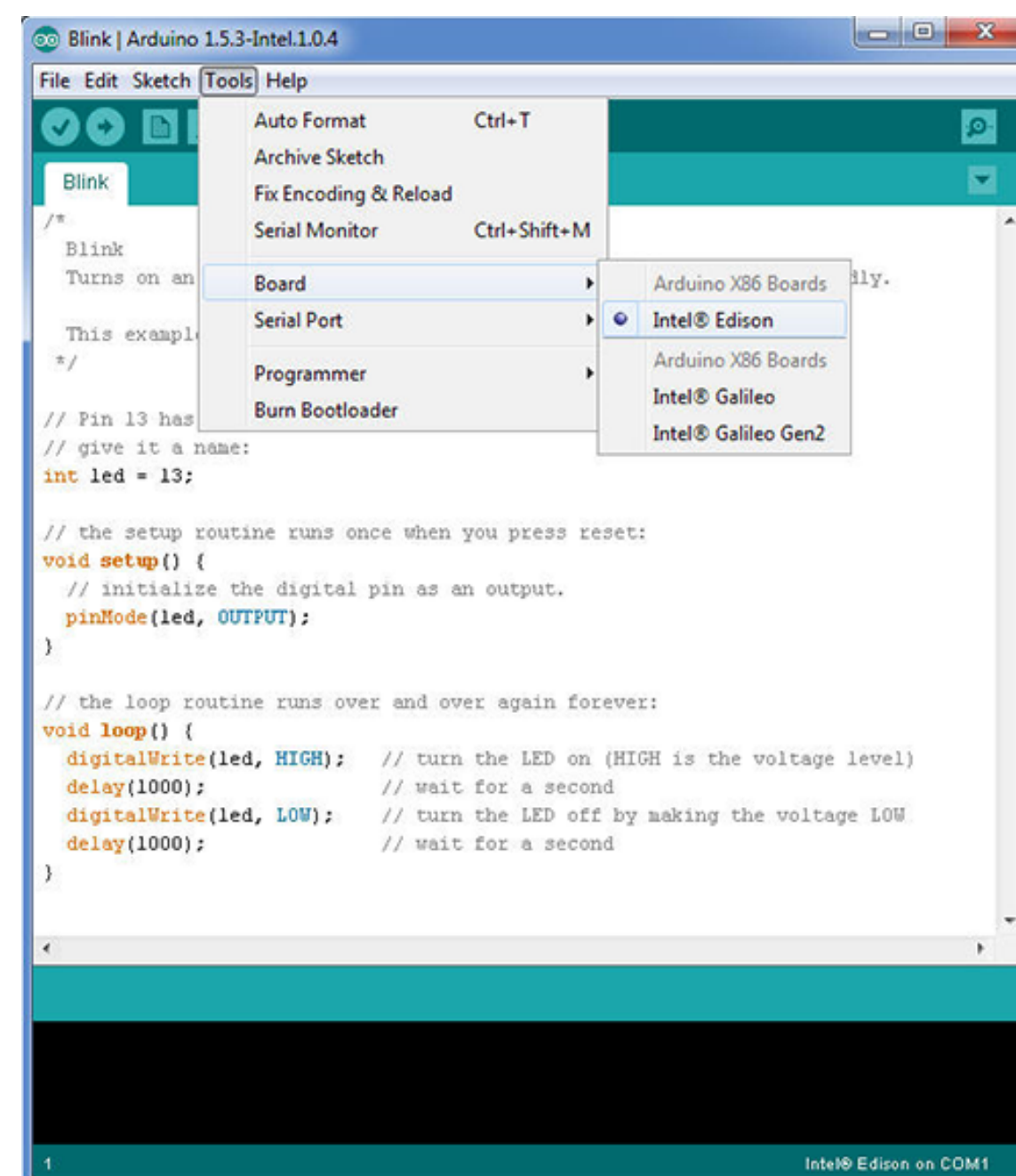
Once the installation is complete, the **Intel i686** should be marked as installed in the Boards Manager.

Run the test code - Blink a LED



Follow the instruction below to test if the microcontroller is correctly installed.

In Arduino IDE, go to **File > Examples > 1.Basics > Blink** and open the LED blink example sketch.



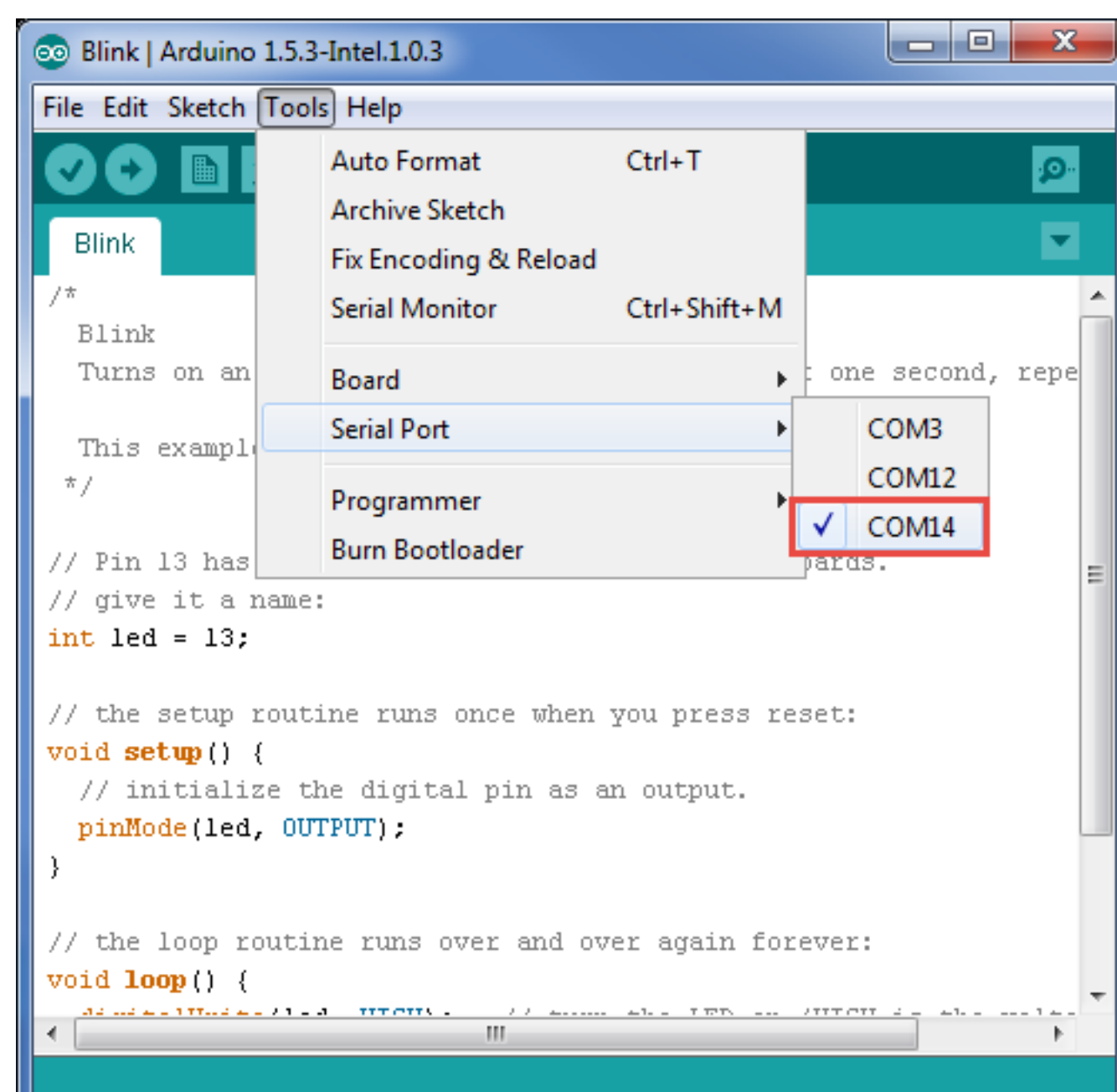
Go to **Tools > Board** and select the board type ("Intel[®] Edison" in our case).

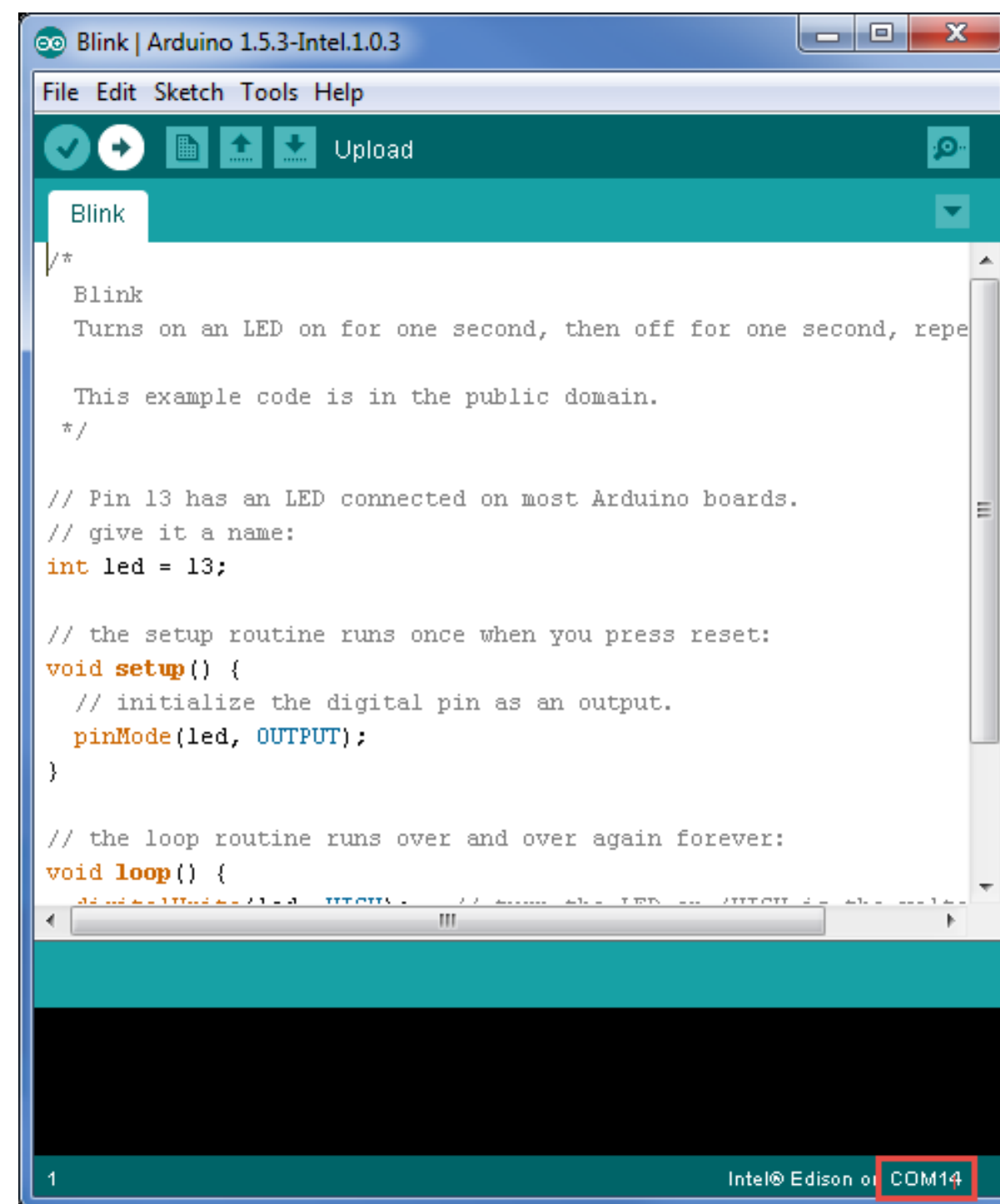
Go to **Tools > Serial Port** and find COM port of your microcontroller then select it.

Note: An easy way to find the correct COM port is to reconnect your board to your PC, restart the IDE, and open the menu. The newly appeared entry should be the Intel Edison board.

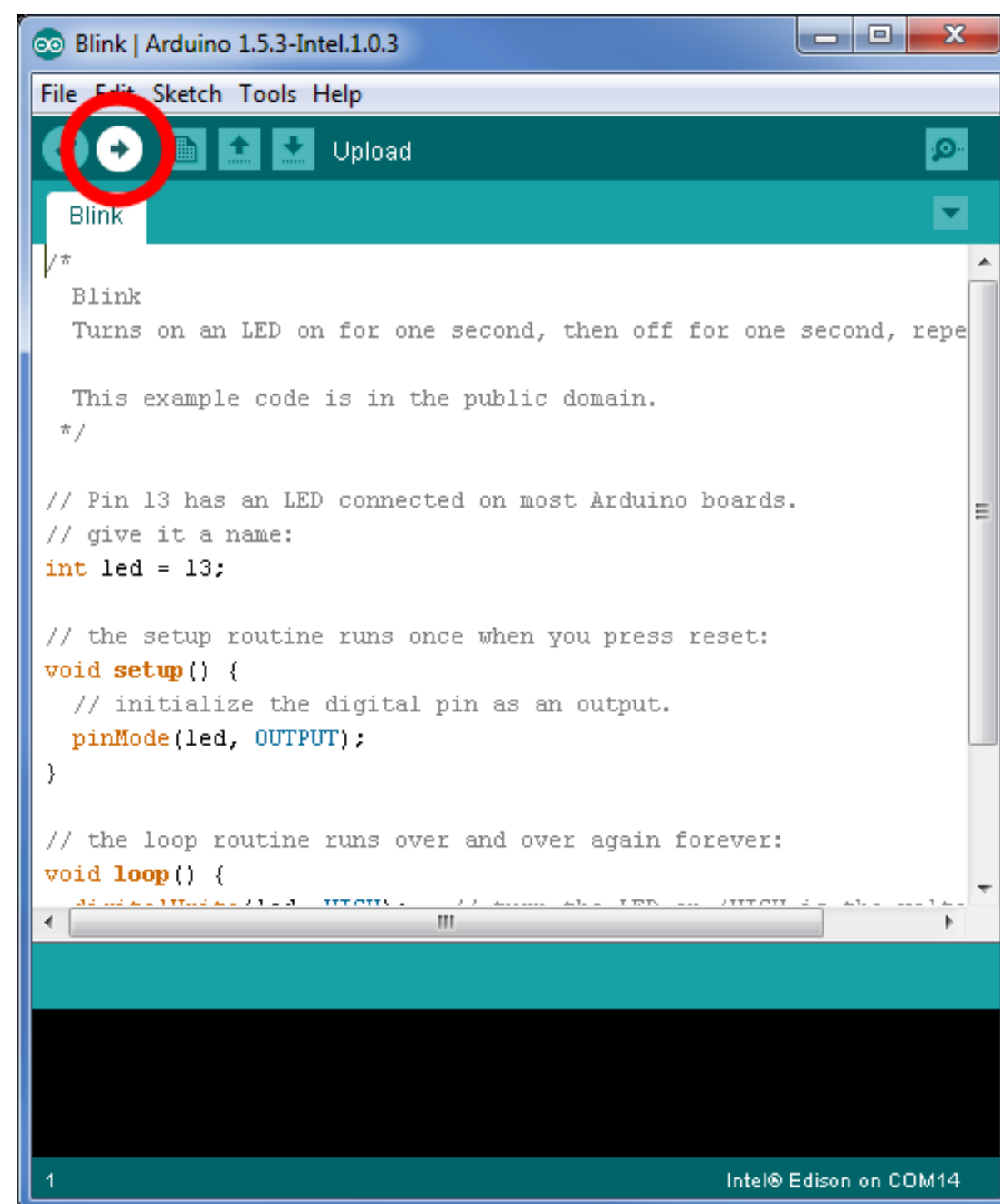


As COM1 ports and COM2 ports are usually reserved for essential hardware, the COM port to our board is likely to be COM3 or after. Its name will be “**Intel Edison Virtual Com Port**”, same as the name shown in the Device Manager.





COM port will show up in the bottom right corner of the Arduino IDE window.



Click **Upload** to upload the code into your board.

```
// initialize the digital pin as an output.
pinMode(led, OUTPUT);
}

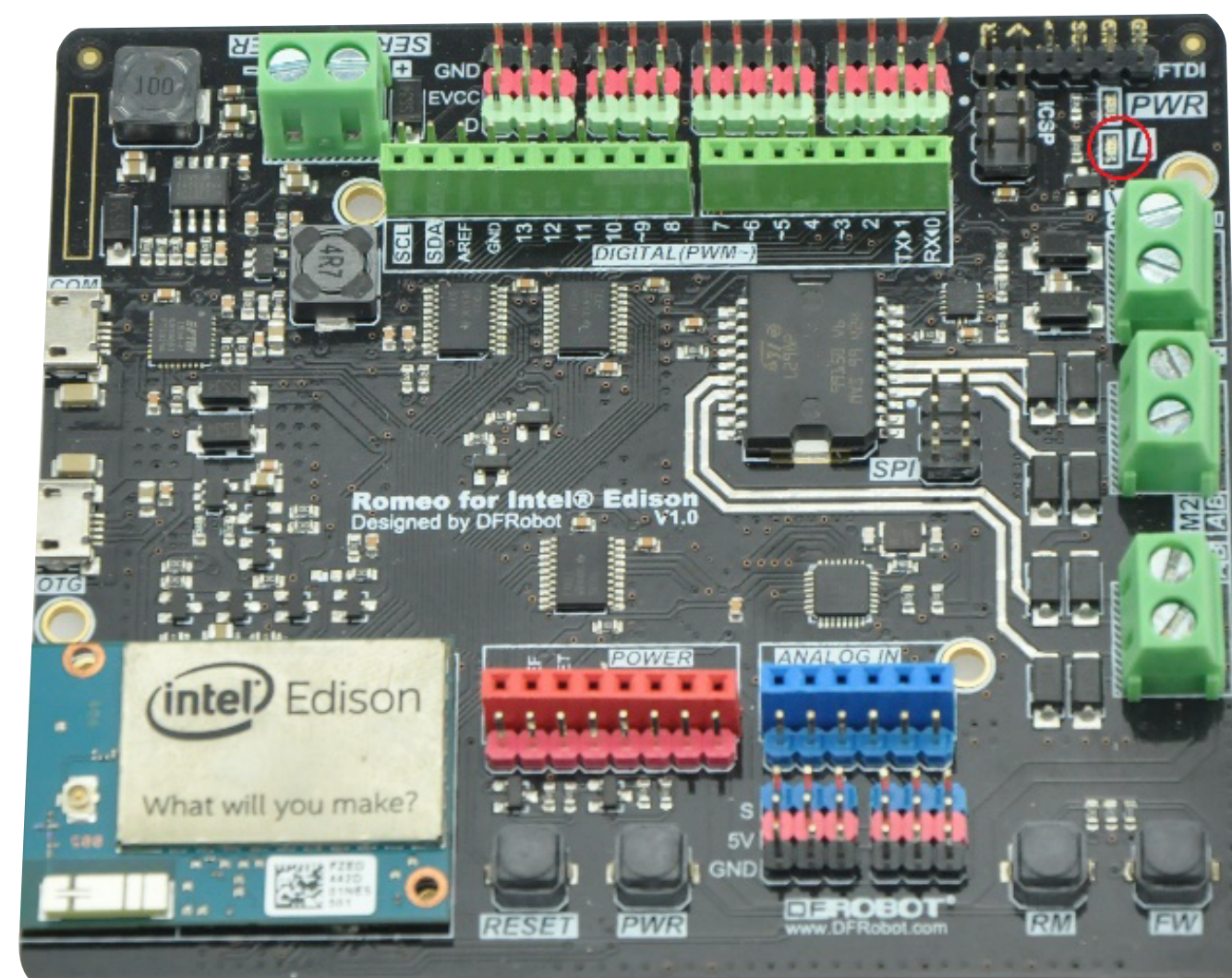
// the loop routine runs over and over again forever:
void loop() {
  // ...
}
```

Done uploading.

Transfer complete

1 Intel® Edison on COM14

You should see “**Done uploading**” and “**Transfer complete**” messages when your sketch has been successfully uploaded.



When upload is complete, the LED indicator on your board should be blinking once for each second.