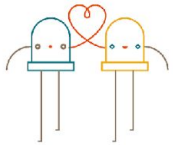
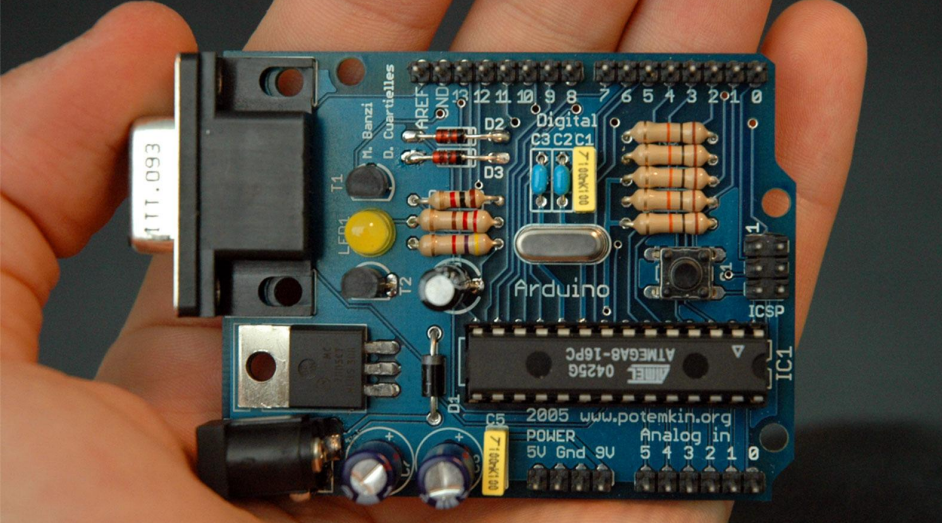
The Arduino Engineering Kit: An adventure in MATLAB, Simulink and Arduino

Italy - Oct, 2018

WHAT IS ARDUINO

AN **OPEN SOURCE** HARDWARE, SOFTWARE AND CONTENT PLATFORM



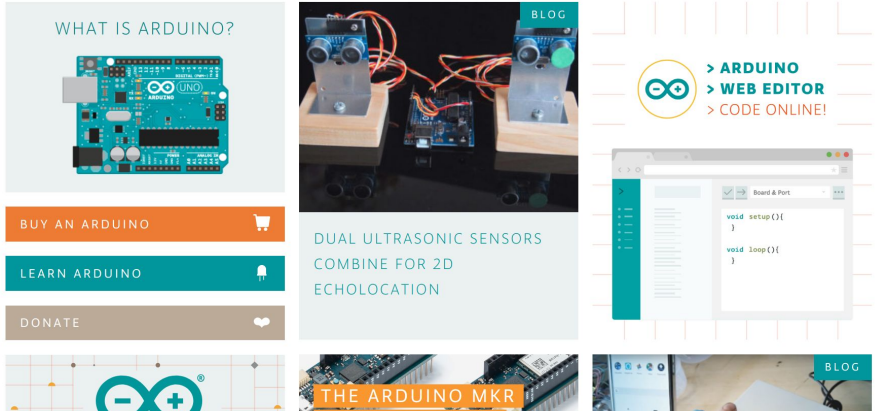


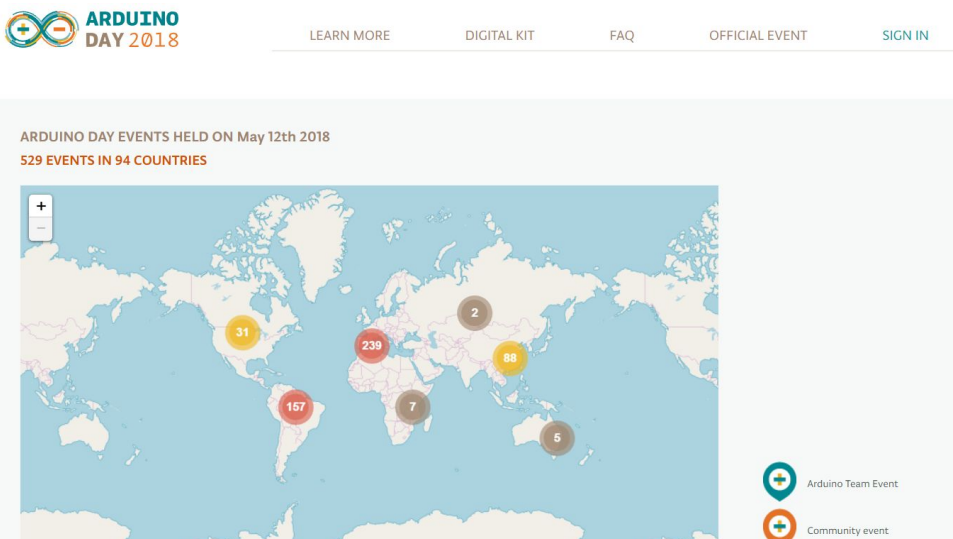
ARDUINO 1.8.7

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software.

This software can be used with any Arduino board.

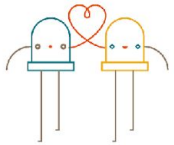
Refer to the Getting Started page for Installation instructions.





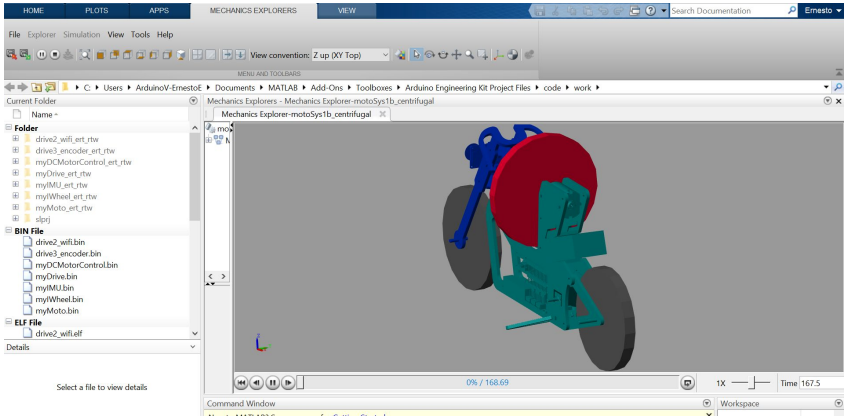
ARDUINO ENGINEERING KIT

THE **FIRST** ARDUINO KIT **FOR ENGINEERING STUDENTS (**and **EDUCATORS)**



ARDUINO EDUCATION

MATLAB® & SIMULINK®



WHAT IT IS INCLUDED

CONTENT (1 of 2)

EDUCATION

CHAPTERS | DASHBOARD

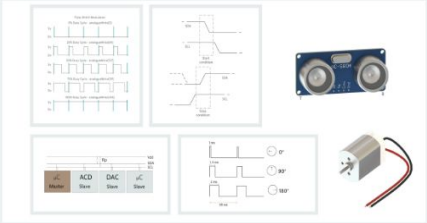
but it is recommended to start with chapter 4.

1. INTRODUCTION

Get started with the Arduino Engineering course, get to know the materials included in the kit and the tools you will use to build the projects.

2. GETTING STARTED

Learn the basics for Arduino IDE, MATLAB® user interface, and Simulink® models. Your will discover how these three tools can be connected to each other while making practical exercises.



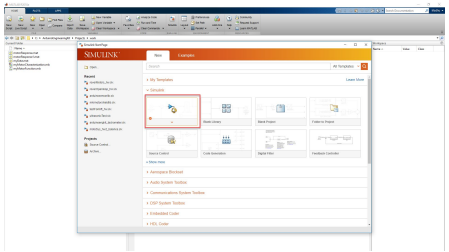
3. CONCEPTS

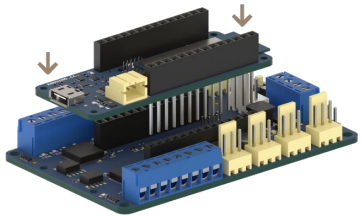
Go through a detailed explanation about key engineering concepts such as encoders, I2C communication, PWM signals, and LiPo batteries.

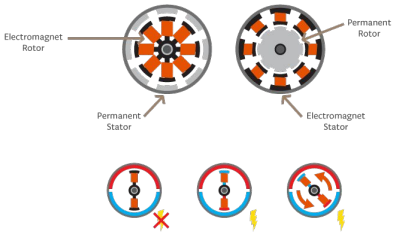
CONTENT (2 of 2)

The content is divided into different blocks:

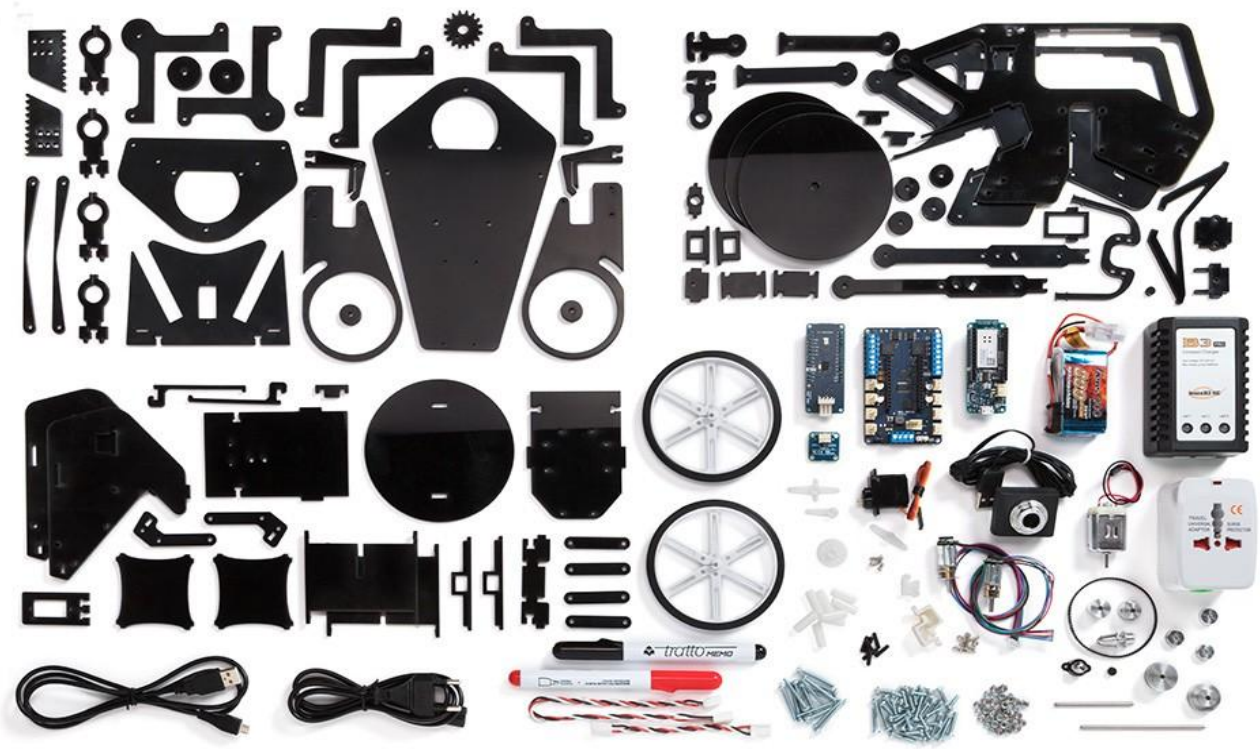
- ➔ Getting started
  - ◆ Arduino
  - ◆ Matlab
  - ◆ Simulink
- ➔ Concepts
- ➔ Projects
  - ◆ Drawing Robot
  - ◆ Mobile Rover
  - ◆ Self Balancing Motorbike



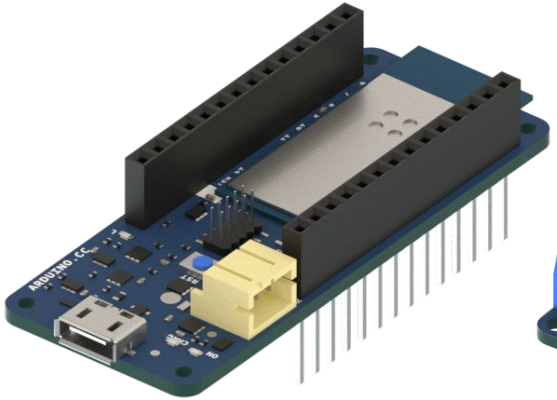




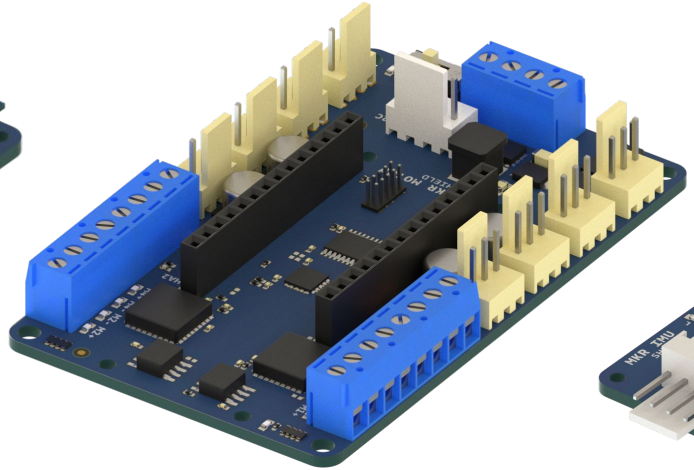
HARDWARE - MATERIALS



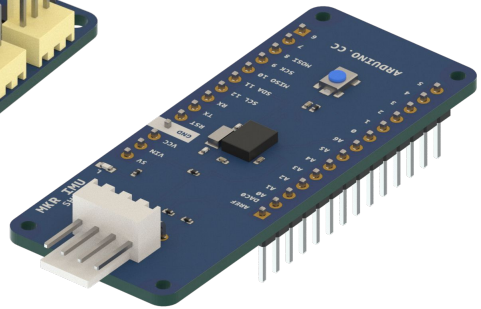
HARDWARE - BOARDS



MKR 1000

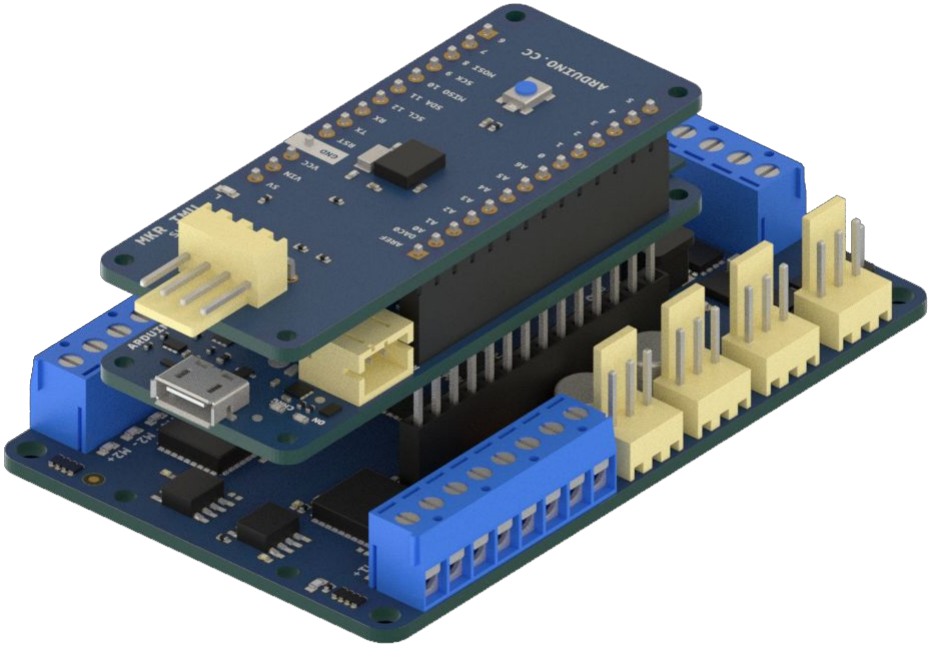


MKR Motor Carrier



IMU Shield

HARDWARE - BOARDS



“Panino” connection

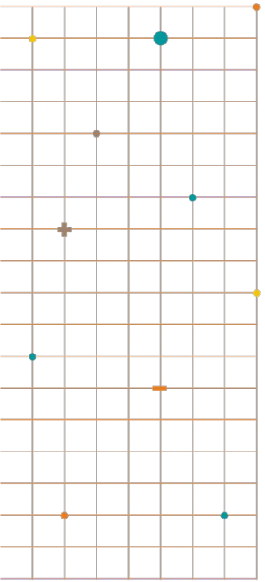
SUPPORT - INSIGHTS

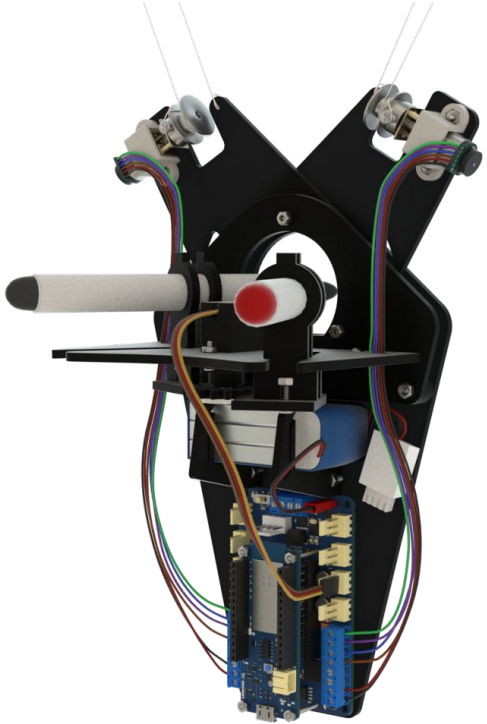
Full Dedicated Support with high customer satisfaction

Tickets created in the last 30 days	Median first reply time	Customer satisfaction
331	12.4hrs	88%
↑ 28%	↓ 13%	↑ 3%

PROJECTS DEMO

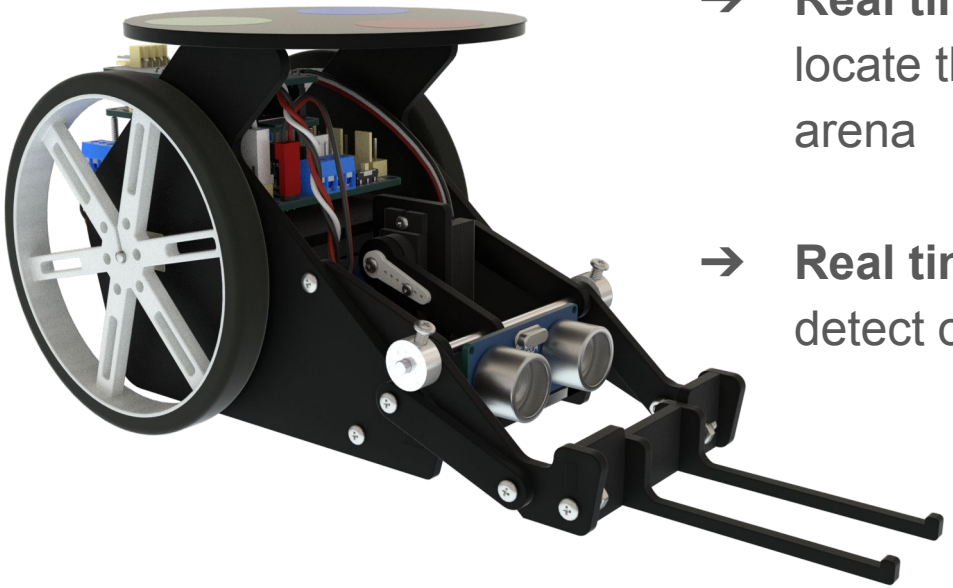
DRAWING ROBOT





- **Image processing** of pictures to take from them the traces and replicate it in a white board
- **Trigonometric concepts** that allow knowing the position of the robot on the whiteboard
- **Mathematical movement concepts** to transform pixels that make up the images in distance the robot has to cover

MOBILE ROVER



- → **PID Control concepts** in differential platforms
- → **Real time image processing** to locate the robot position on the arena
- → **Real time image processing** to detect obstacles

SELF BALANCING MOTORCICLE

- ➔ Apply the **mathematical theory** in the simulink model
- ➔ **PID control** modeling based on **IMU sensor** data
- ➔ Apply **safety measures**

THANK YOU!