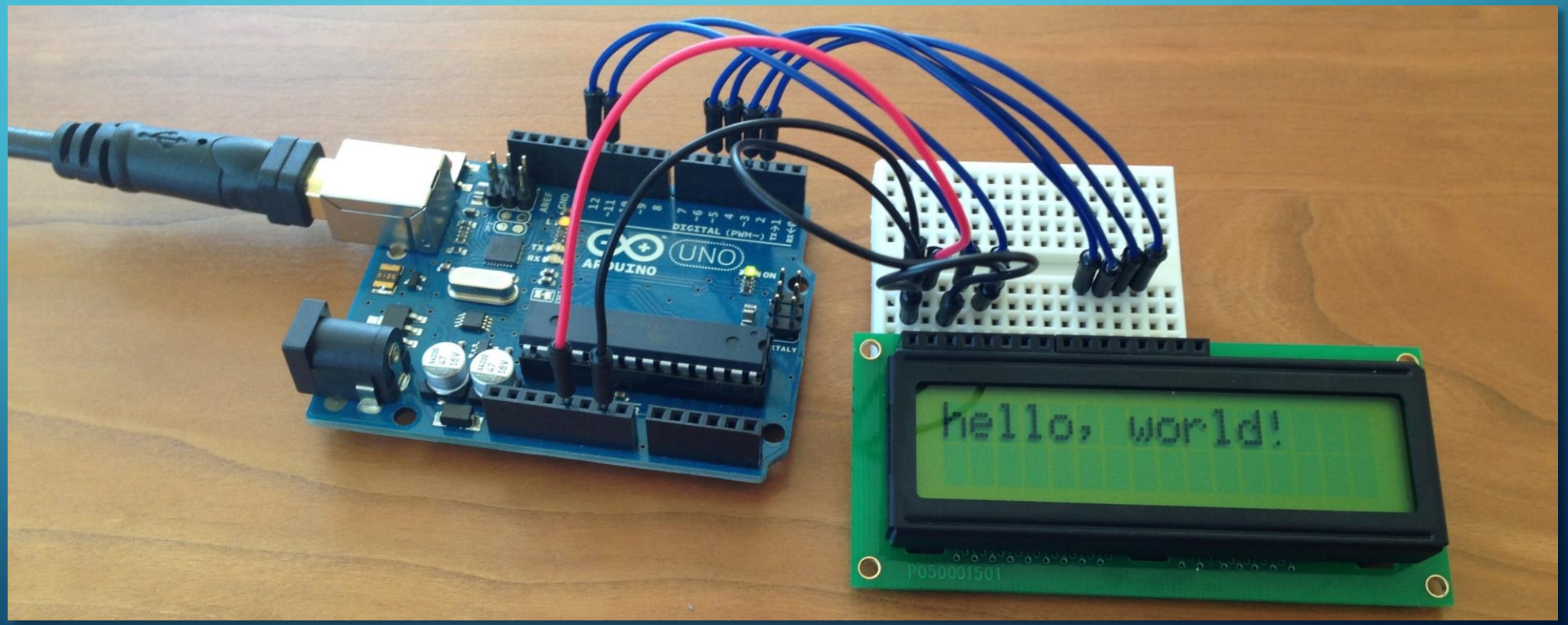
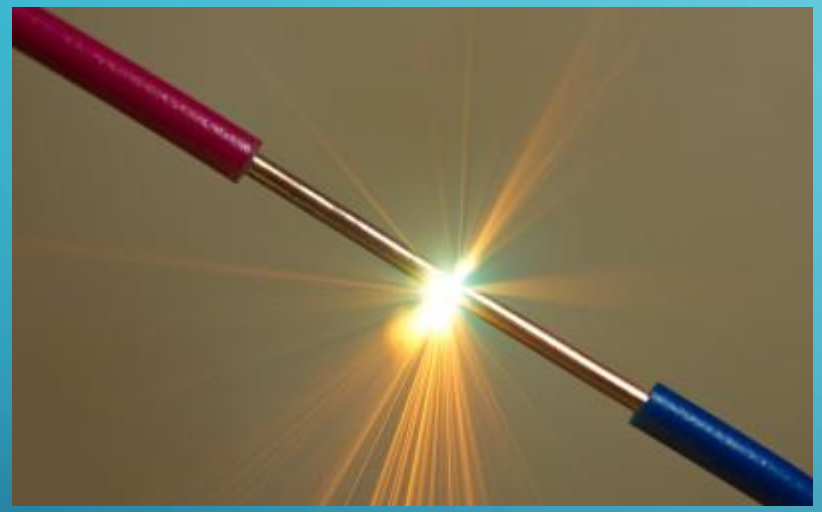
GETTING STARTED WITH ARDUINO



ELECTROSTATISCHE ONTLADING

1. ‘Ontlaad’ jezelf door eerst de tafel vast te nemen
2. Neem zoveel mogelijk de bordjes vast aan de zijkanten
3. Gebruik bij het ‘serieuze’ werk een ESD polsband

KORTSLUITING



Spanning juist ?
Polariteit juist ? + en – (GND)

https://youtu.be/ZfjhVf1QphQ

Werk per twee : controleer mekaar!

ELECTROCUTIE

- 12 Volt of minder : veilig
- Hogere spanning : opletten
- 230 Volt : gevaarlijk !

DE ARDUINO FAMILIE

ARDUINO, GENUINO, ESP8266, …

HET BEGON MET DE ARDUINO UNO

Doel

Goedkoop en eenvoudig ontwikkelen op microcontrollers

EN SNEL KWAMEN ER MEER ARDUINO'S

Arduino Uno

Arduino Leonardo

Arduino Due

Arduino Yún

Arduino Tre

Arduino Micro

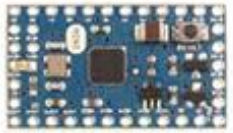
Arduino Robot

Arduino Esplora

Arduino Mega ADK

Arduino Ethernet

Arduino Mega 2560

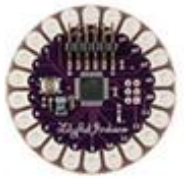


Arduino Mini

LilyPad Arduino USB

LilyPad Arduino Simple

LilyPad Arduino SimpleSnap



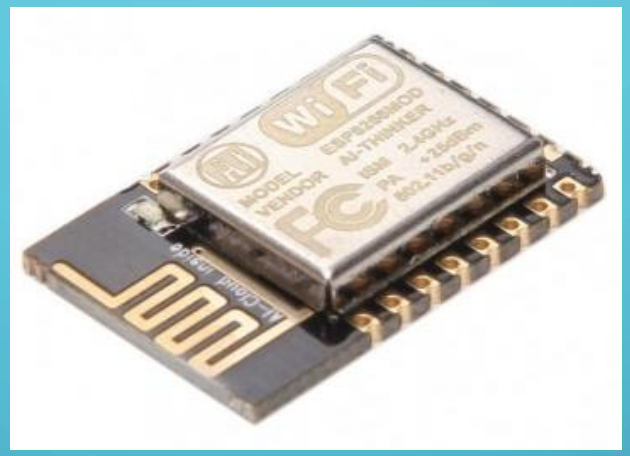
LilyPad Arduino

Arduino Nano

Arduino Pro

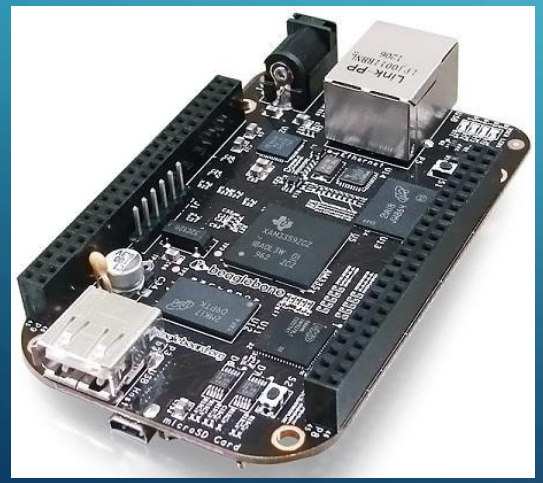
EN ‘CONCURRENTEN’

RaspBerry Pi

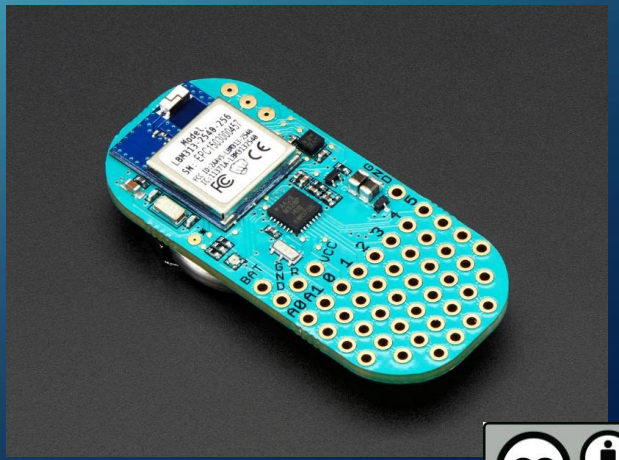


ESP8266

Bluz.io

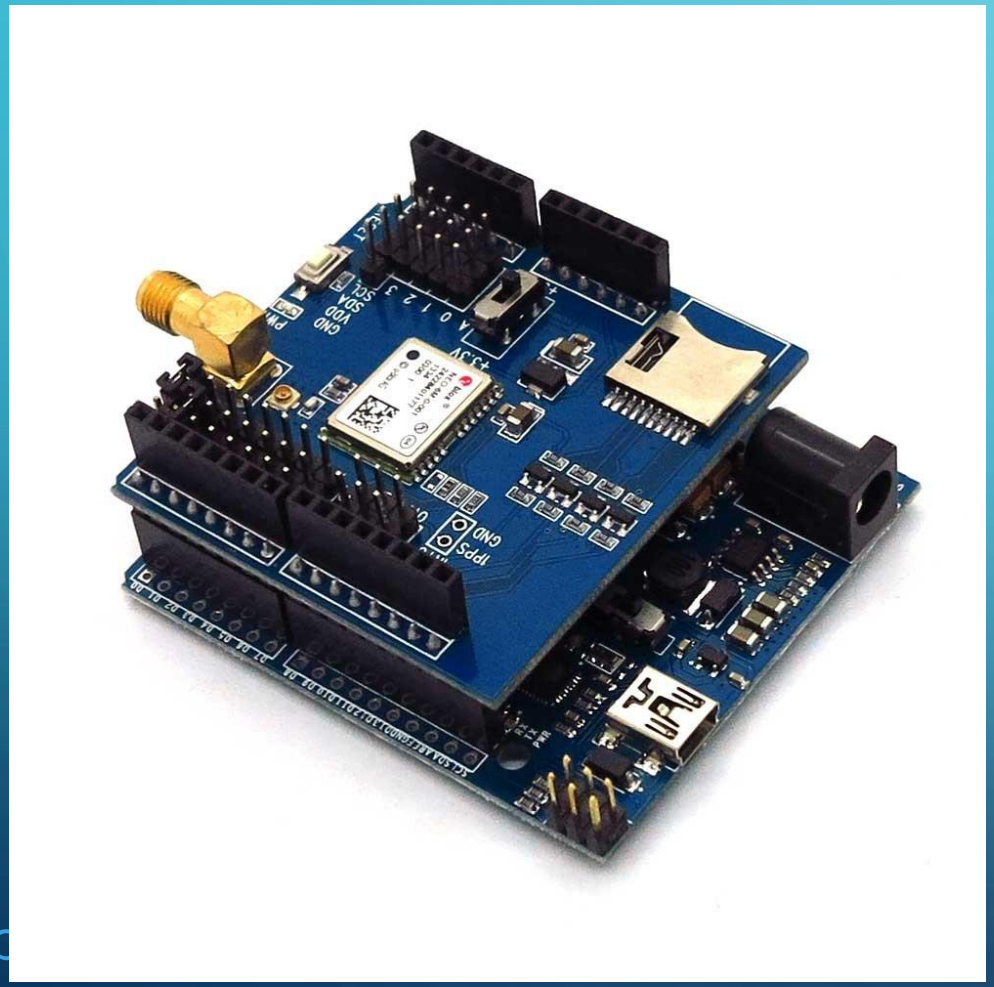


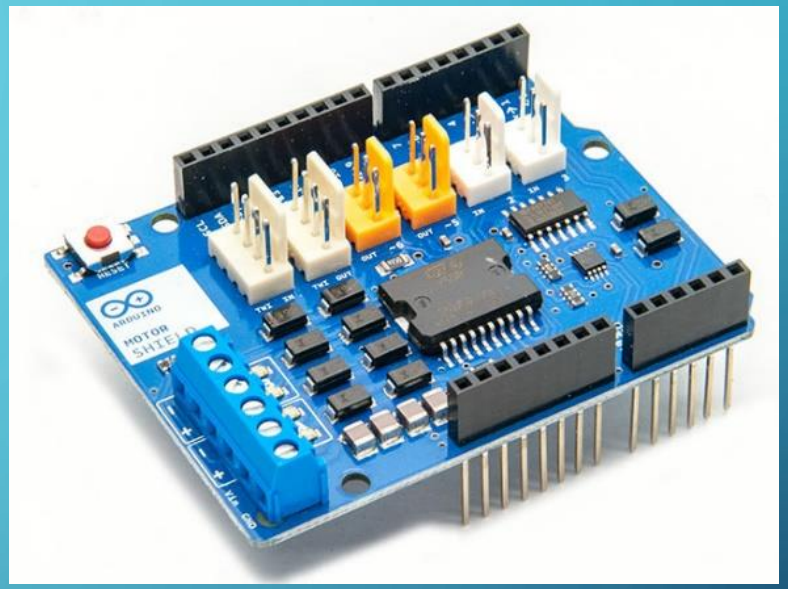
Beagle Board

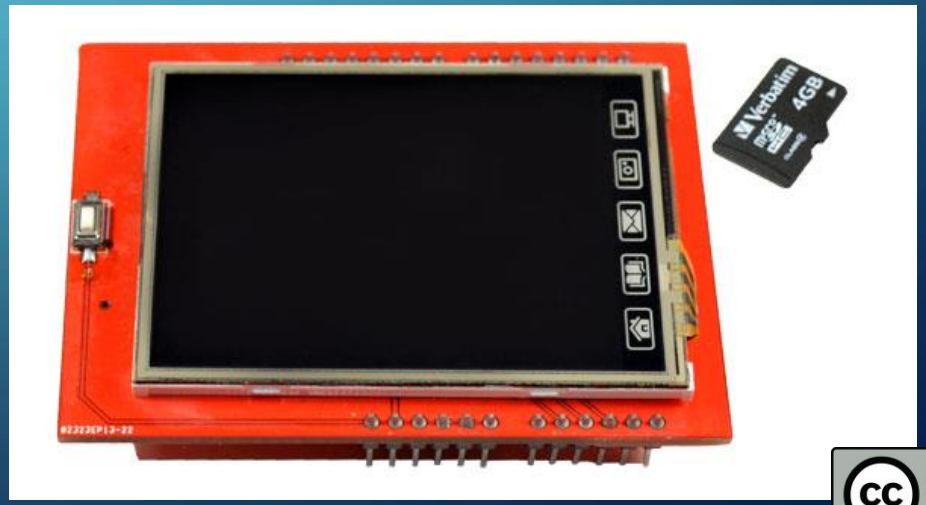


LightBlue Bean

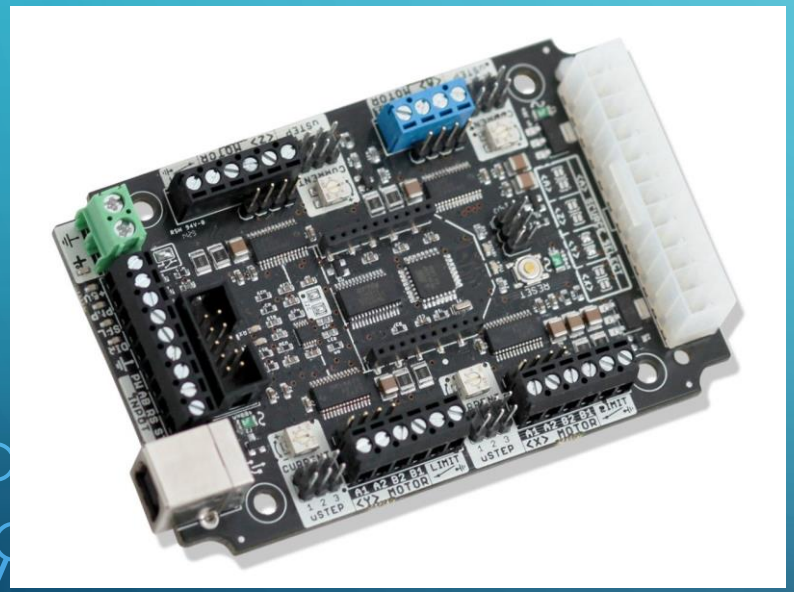
SHIELDS : UITBREIDINGEN



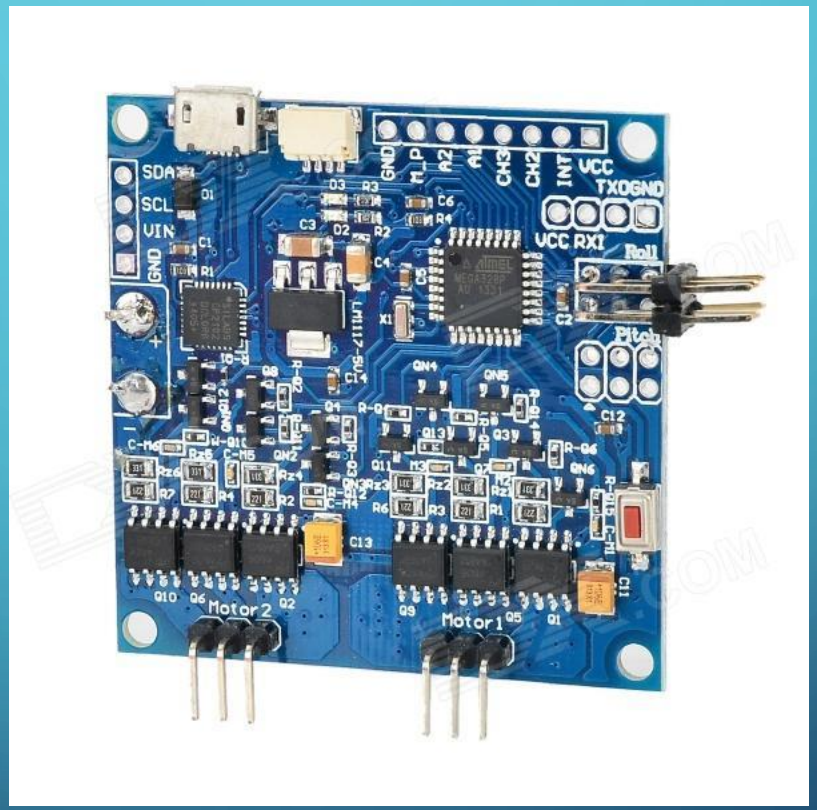




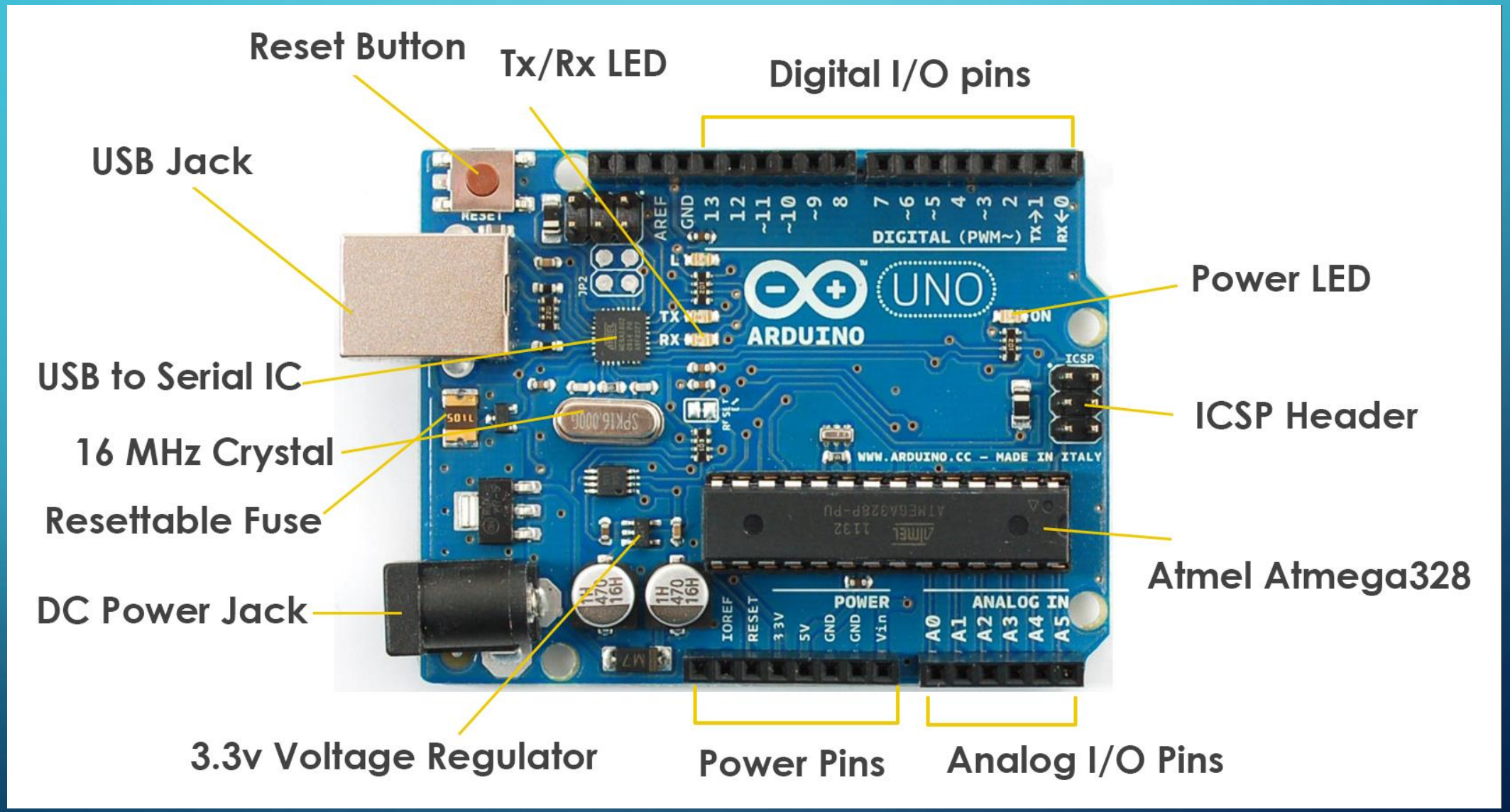
GEBOUWD ROND EEN ‘ARDUINO’



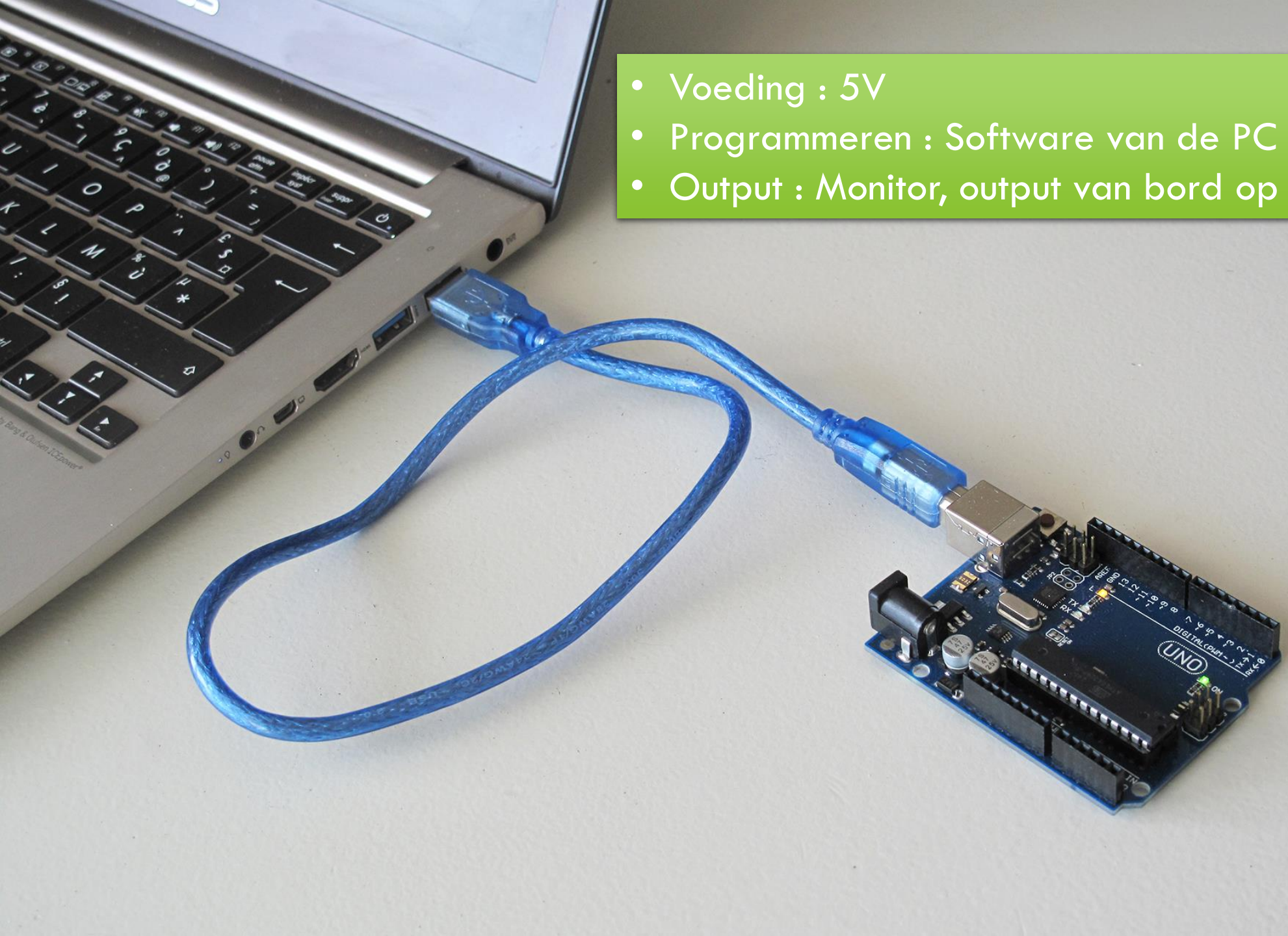
xPRO CNC

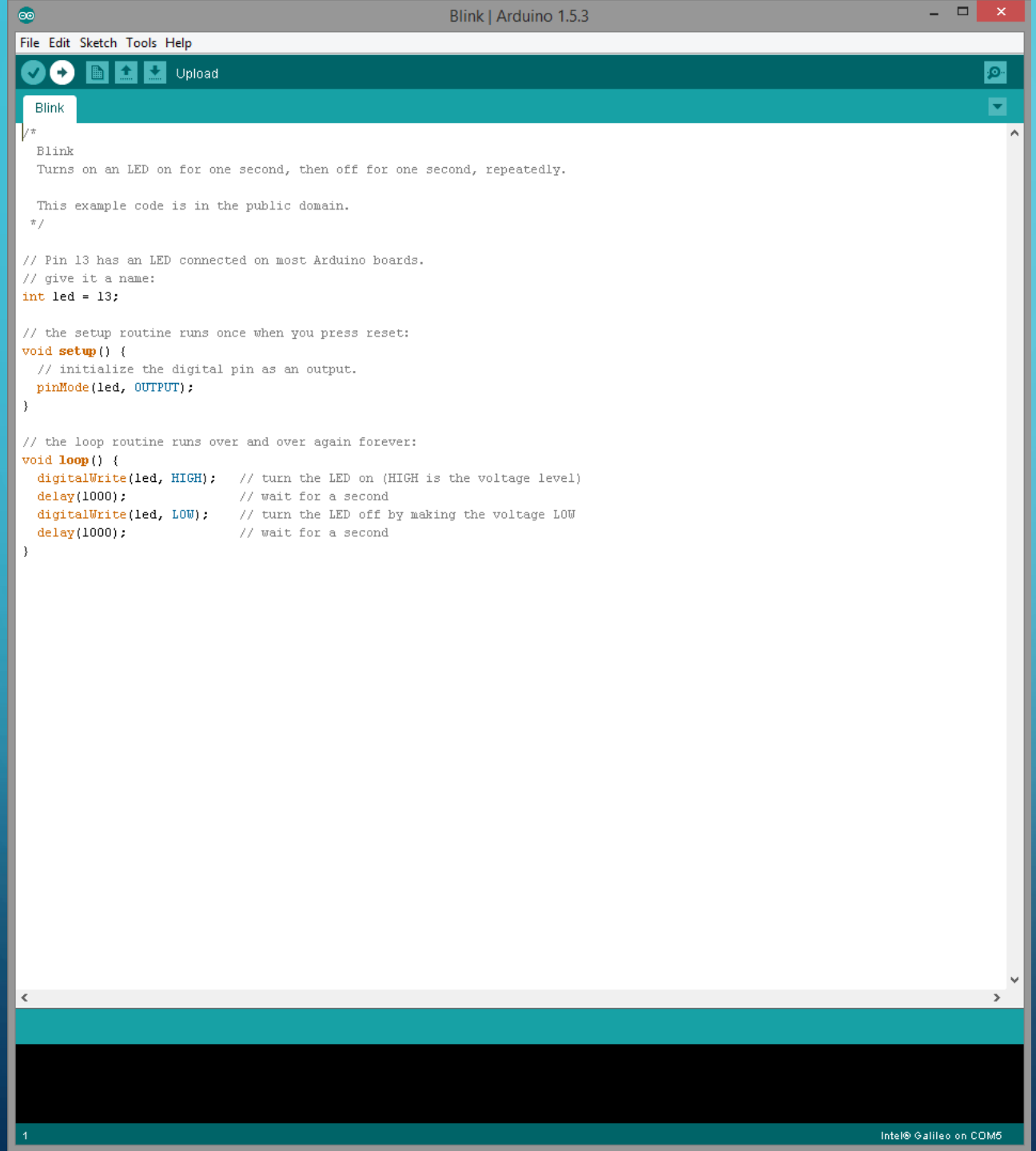


Gimbal Controller


Reset Button
Tx/Rx LED
Digital I/O pins
USB Jack
Power LED
USB to Serial IC
ICSP Header
16 MHz Crystal
Resettable Fuse
Atmel Atmega328
DC Power Jack
3.3v Voltage Regulator
Power Pins
Analog I/O Pins
UNO
ARDUINO
DIGITAL (PWM~)
POWER
ANALOG IN
WWW.ARDUINO.CC – MADE IN ITALY

- Voeding : 5V
- Programmeren : Software van de PC naar het bord
- Output : Monitor, output van bord op PC





Programmeertaal : C++

codebender

Search

Save Sketch | Verify Code | Run on Arduino | Arduino Uno

Blink

Blink.ino

+ Add File

Sketch has no description

Clone | Download

Share | Delete

To upload code to your Arduino from your browser, please install our browser plugin for Chrome or Firefox. Get it now!

```
/*
  Blink
  Turns on an LED on for one second, then off for one second, repeatedly.

  This example code is in the public domain.
 */

// Pin 13 has an LED connected on most Arduino boards.
// give it a name:
int led = 13;

// the setup routine runs once when you press reset:
void setup() {
  // initialize the digital pin as an output.
  pinMode(led, OUTPUT);
}

// the loop routine runs over and over again forever:
void loop() {
  digitalWrite(led, HIGH);   // turn the LED on (HIGH is the voltage level)
  delay(1000);               // wait for a second
  digitalWrite(led, LOW);    // turn the LED off by making the voltage LOW
  delay(1000);               // wait for a second
}
```

In 'the Cloud :
Search,
Clone,
Go!

Sketch size: **1090** bytes | Number of lines: **24**

TIJD VOOR ACTIE

OEFENING 1

1. Bord aansluiten aan USB – Power LEDs ?
2. IDE starten
3. Blink.ino openen
4. Eventueel aanpassen waar nodig – op welke pin zit de LED ?
5. Compileren – Downloaden

OEFENING 2

Schrijf een programma dat tekst omzet naar Morse Code. Stuur uit op de LED

1. 2 subroutines schrijven : kort(), lang()
2. Gebruik Serial.read()
3. Compileren – Downloaden

WAAR KOOP IK EEN ARDUINO / ONDERDELEN ?
WAAR VIND IK INFORMATIE ?

KOPEN = ONLINE

- Belgie
  - http://Conrad.be
  - http://Antratek.be
  - http://www.electroshopdendermonde.be/ - ook winkel in Dendermonde
- US
  - http://Seeed.com
  - http://adafruit.com
  - http://www.sparkfun.com
- China
  - **http://AliExpress.com**

WAAR VIND IK INFORMATIE

- Google
- https://www.arduino.cc/
- http://www.instructables.com/ - projecten
- http://fritzing.org/home/
- http://hackster.io – projecten
- https://www.sparkfun.com – componenten – tutorials - projecten
- https://github.com/ - software
- https://codebender.cc/ - software

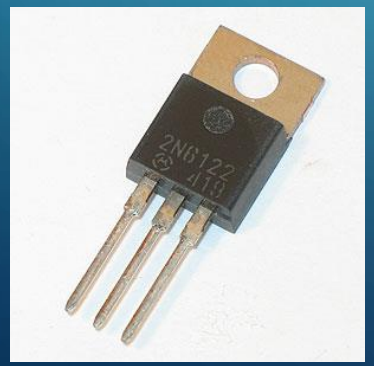
CURSUS ELEKTRONICA IN 5 MINUTEN

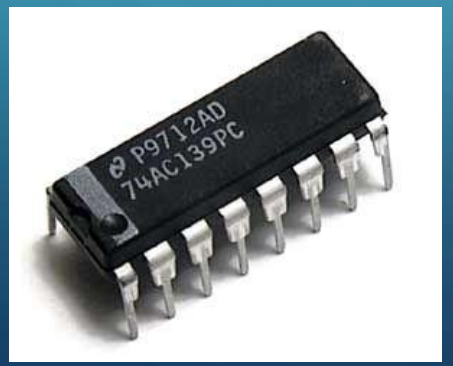
SPANNING EN STROOM

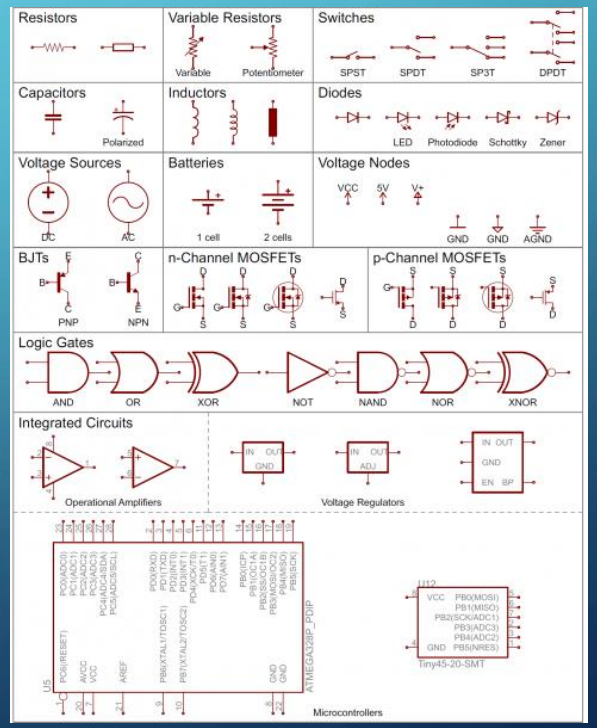
- Analogie : water (druppels) = elektriciteit (electronen)
- Spanning : hoogte-verschil – drukverschil – Volt - V
- Stroom : debiet – Ampere - I
- Vermogen = Spanning * Stroom = V * I – Watt - W

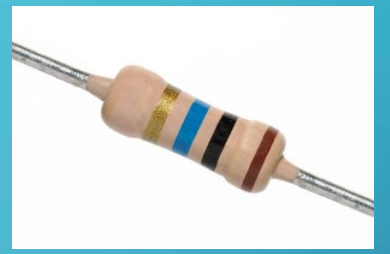
COMPONENTEN

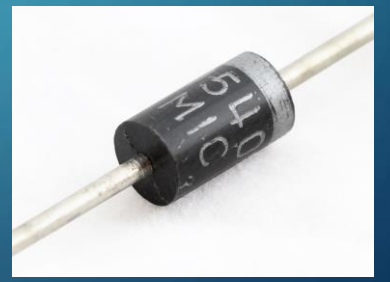
- Weerstand – R – Ohm
- Condensator (C) en Spoel (L)
- Diode – D – Light Emitting Diode – LED
- Transistor
- Geïntegreerde schakeling – IC

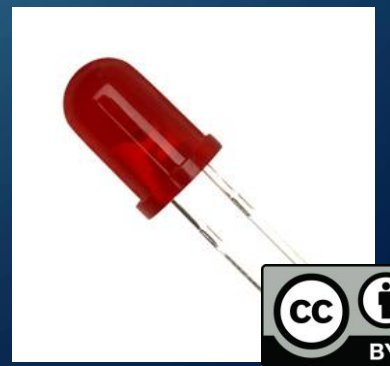






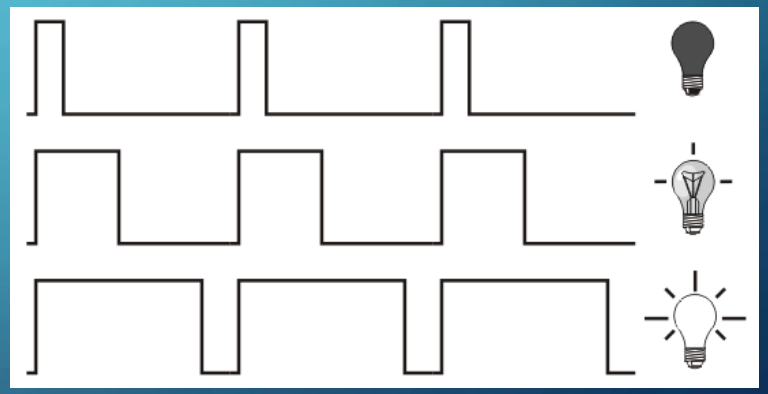




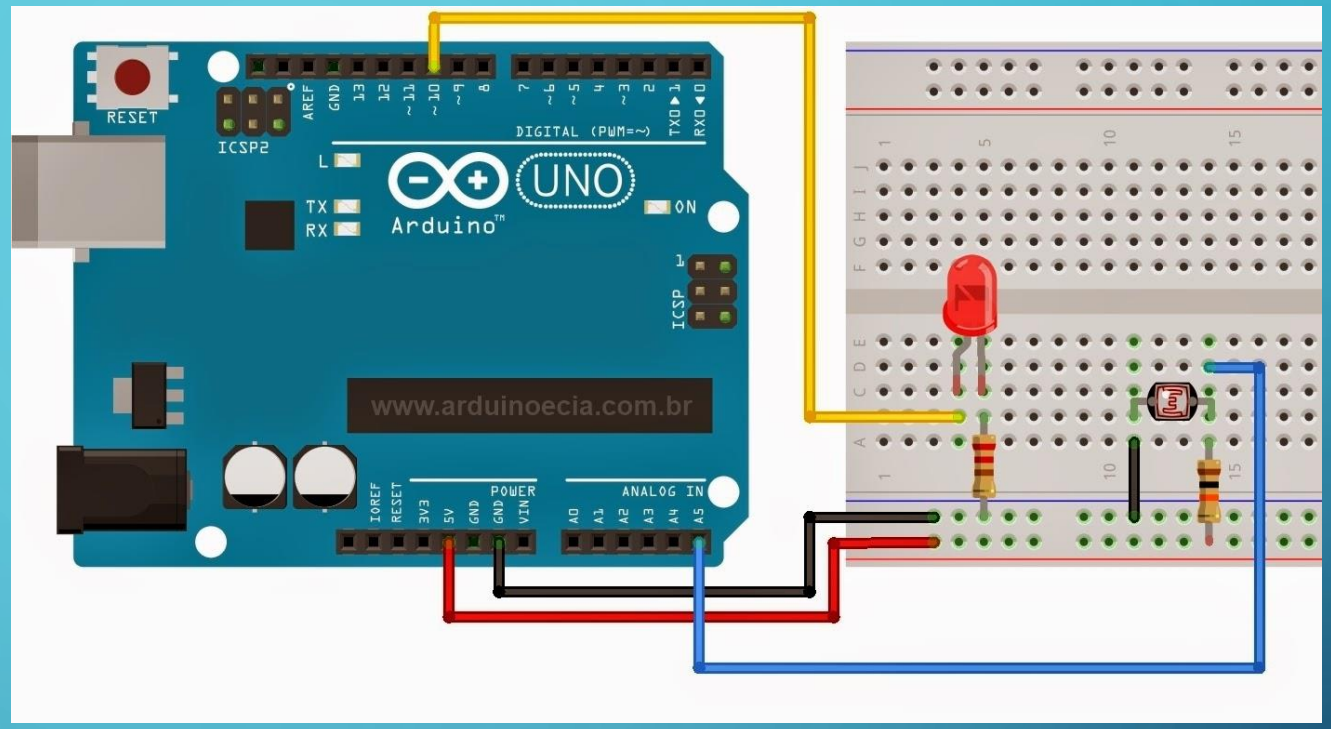


ANALOOG - DIGITAAL

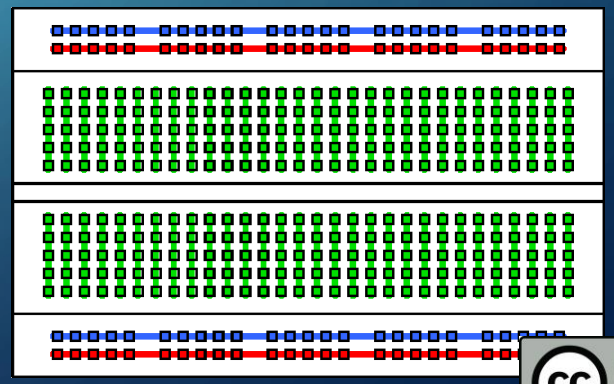
- Digitaal : alleen 0 of 5 V, in de SW weergegeven als 0 en 1
  - Input : digitalRead()
  - Output : digitalWrite()
- Analoog : elke waarde, bvb tussen 0 en 5 V
  - Input : Analoog naar Digitaal conversie : 0 -255
  - Output : 0-255 : Pulse-Width-Modulation - PWM



OEFENING



- Laat een LED branden, in functie van het omgevingslicht
- LED, LDR, R1=10K, R2=470
- Oefening3.ino
- Variant : Buzzer, Servomotor, RGB-LED



SENSOREN


Flame sensor


Magnet-ring sensor


Laser-transmit

Relay module

Obstacle avoidance sensor


Metal touch sensor

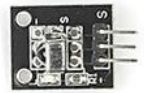

18b20 Temperature sensor


Photo resistor sensor


Joystick PS2


Rotate-encode


Digital-temperature sensor


Infrared-Receive sensor


Analog-temperature sensor


RGB LED


Microphone sensor


Passiver buzzer

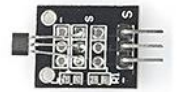

Humiture sensor


Two-color commoncathode LED

Finger-Pulse Sensor module


Magnetic spring

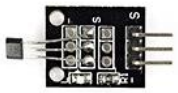

Tilt-Swith


Analogy-hall sensor


Knock sensor


Linear-Hall sensor


Active buzzer


Hall sensor

Colorful Auto-flash


Common-Cathode RED&GREEN LED module


High-Sensitive voice sensor


Push button


Light break sensor


Hydrargyrum-switch sensor


Tracking sensor

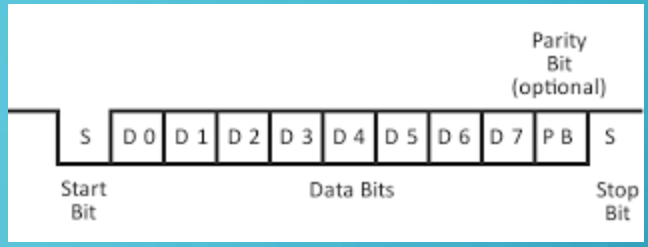

Shock-switch sensor


RGB LED module

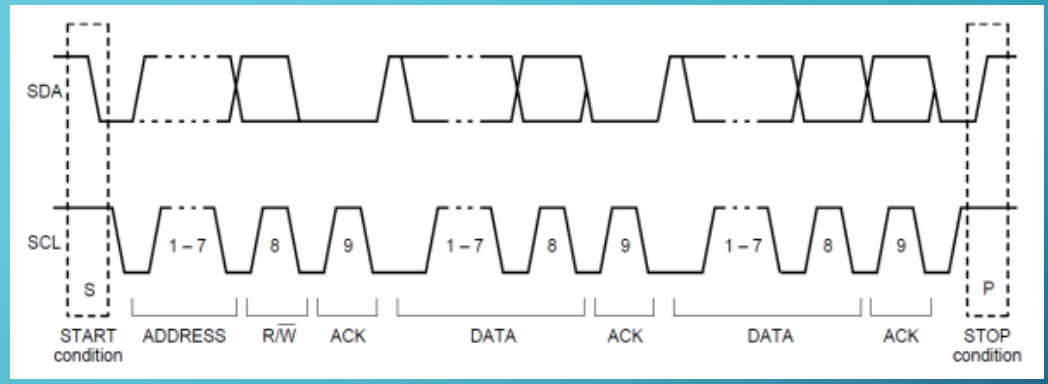

Infrared-transmit

ARDUINO INTERFACES

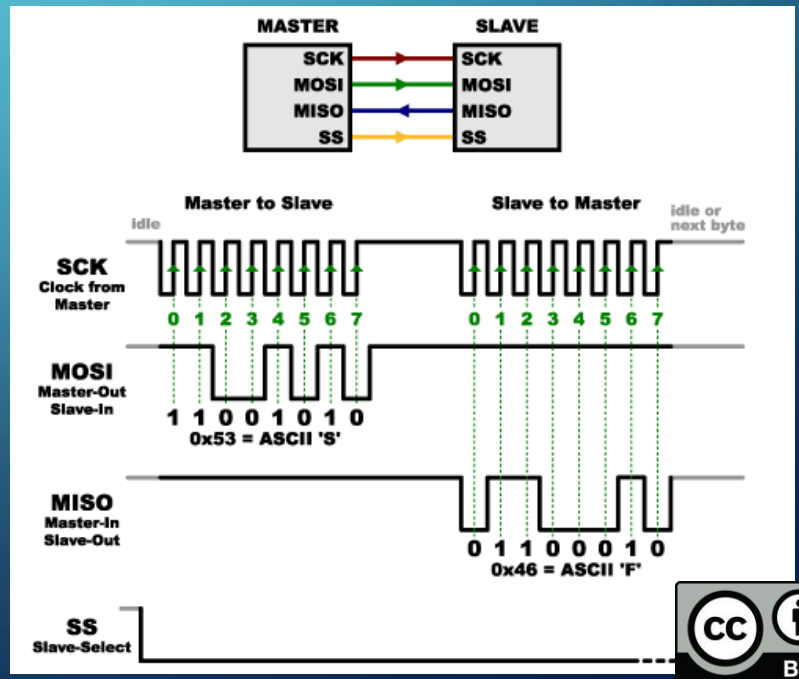
UART : Rx – Tx - GND



I²C : SDA - SCL - GND



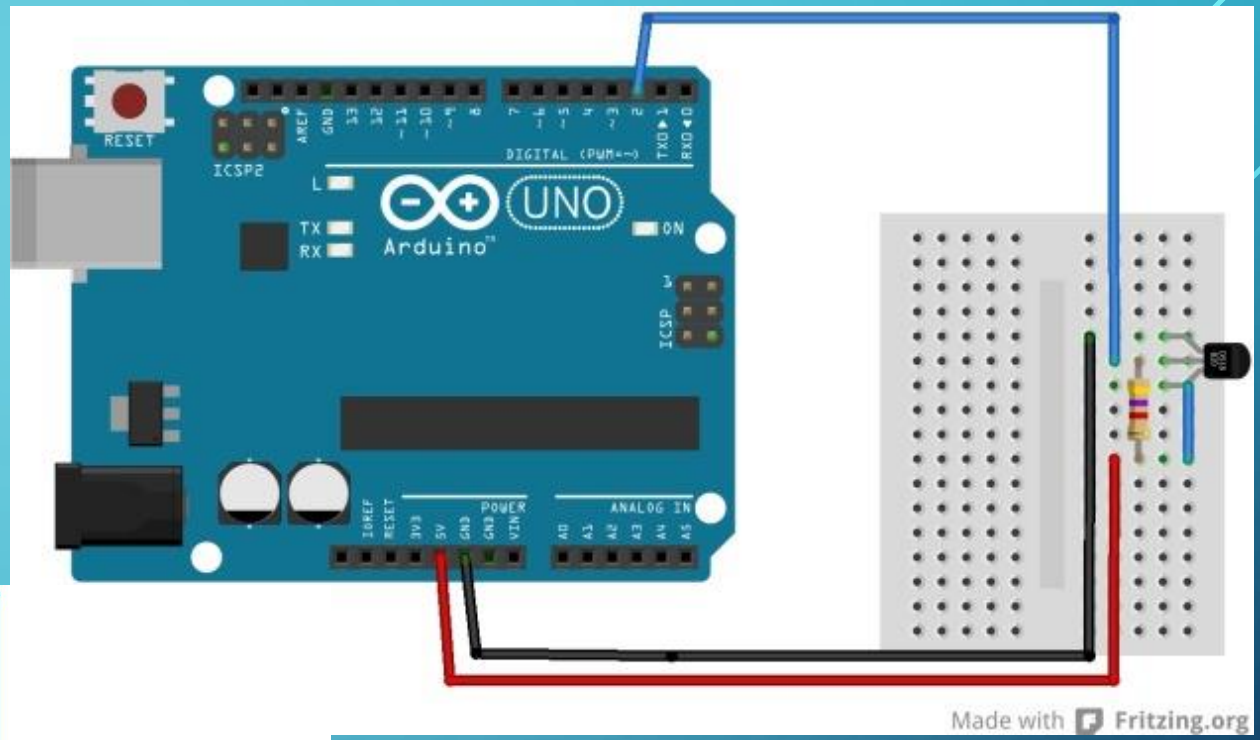
SPI : SCK – MOSI – MISO - SS - GND

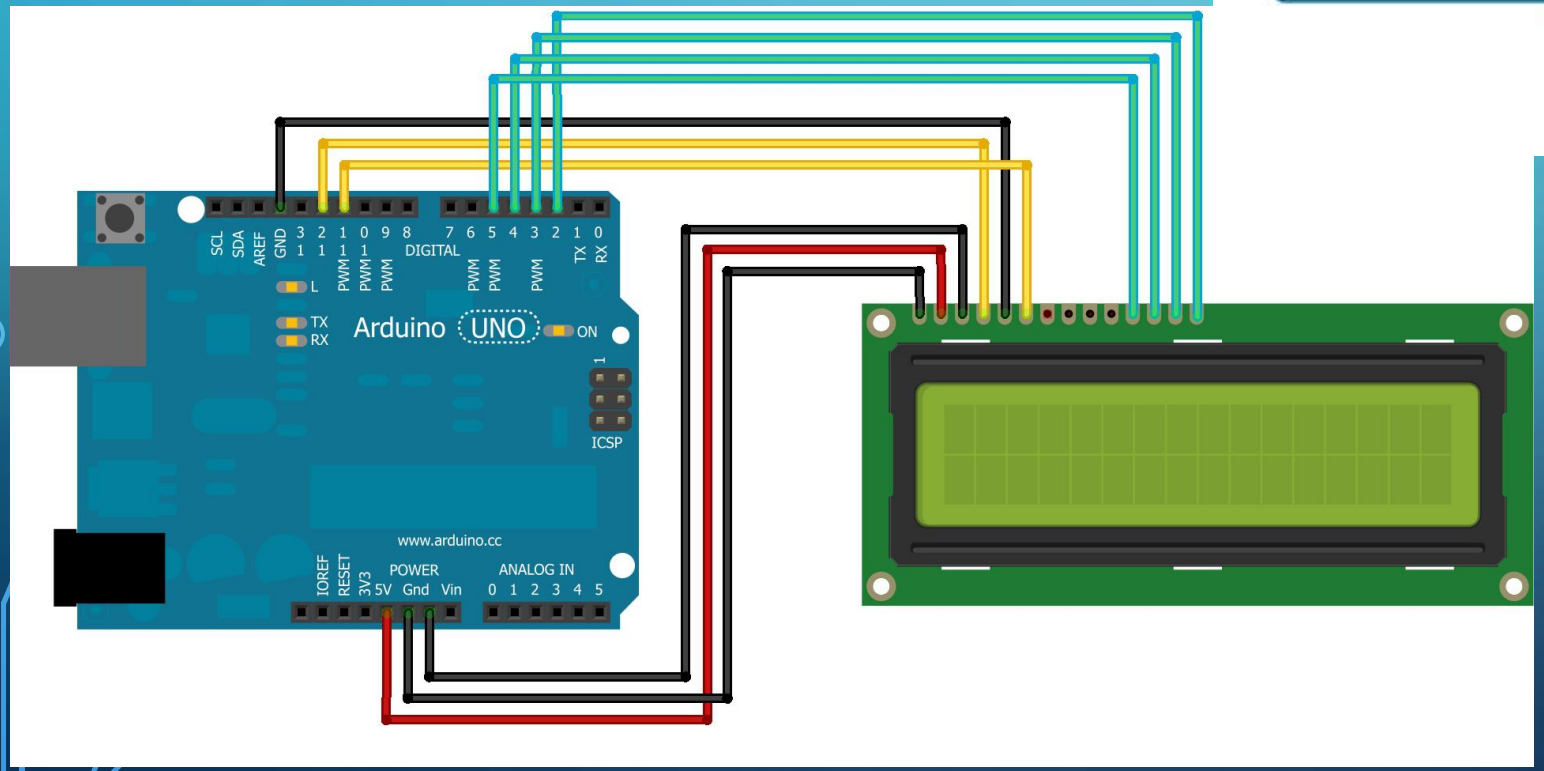


1-Wire - Data - GND

OEFENING

- Digitale Kamerthermostaat





OEFENING

- GPS ontvanger

DEMO

- Kamerthermostaat met Smartphone