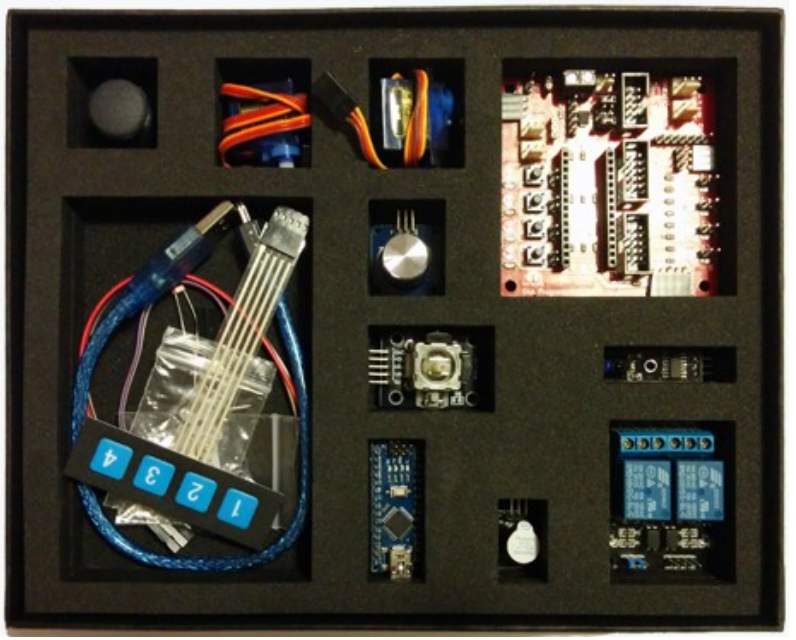
Descobreix Arduino amb Make It!



LLIBRERIA HISPANO AMERICANA

21 /juny / 2016

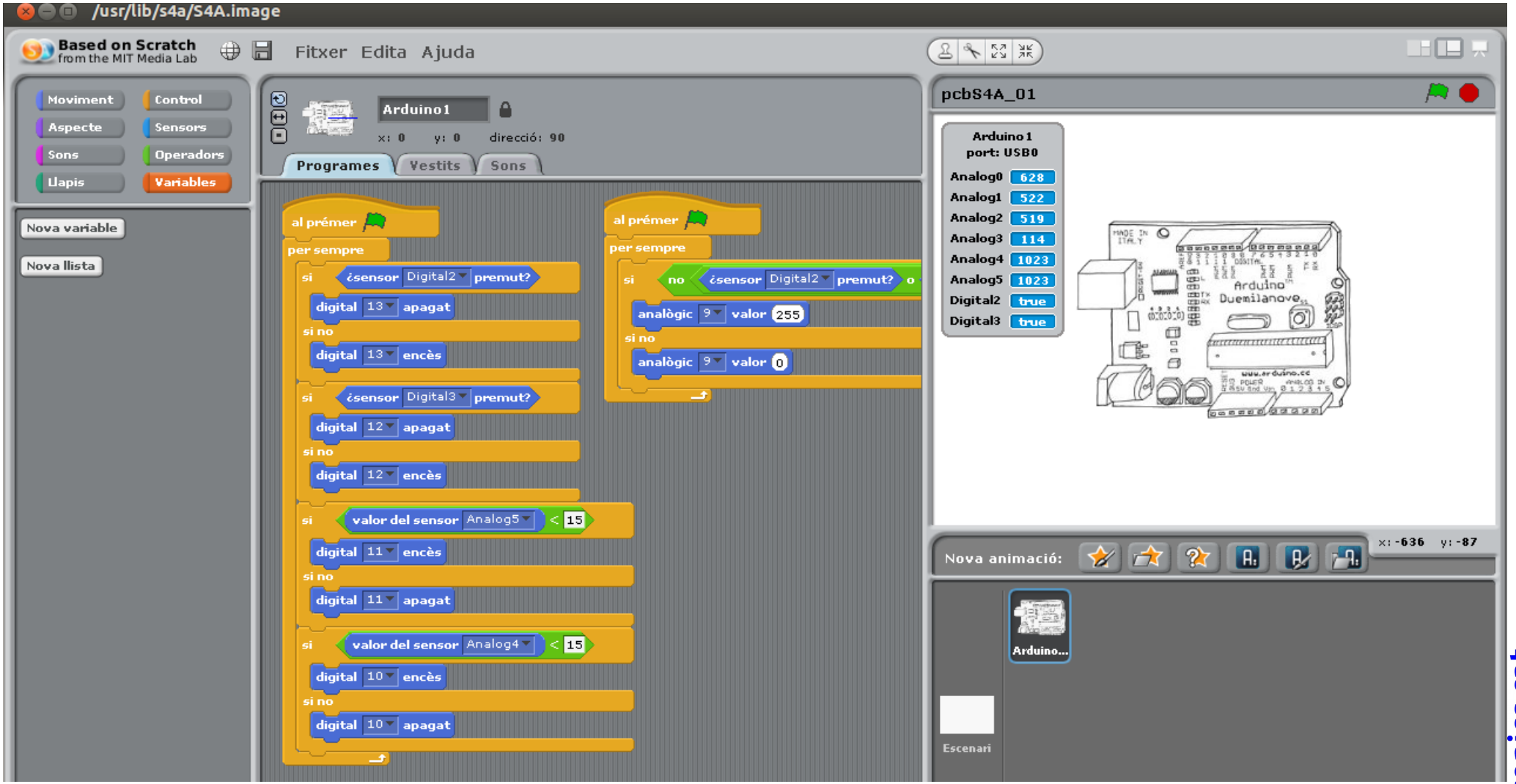
Jordi Binefa i Martínez

Responsable d'R+D+i a electronics.cat
OPEN SOURCE HARDWARE & TRAINING

Professor de cicles formatius a JESUÏTES El Clot
Escola del Clot

S4A Progamming Learning Board

Entorn de l'S4A



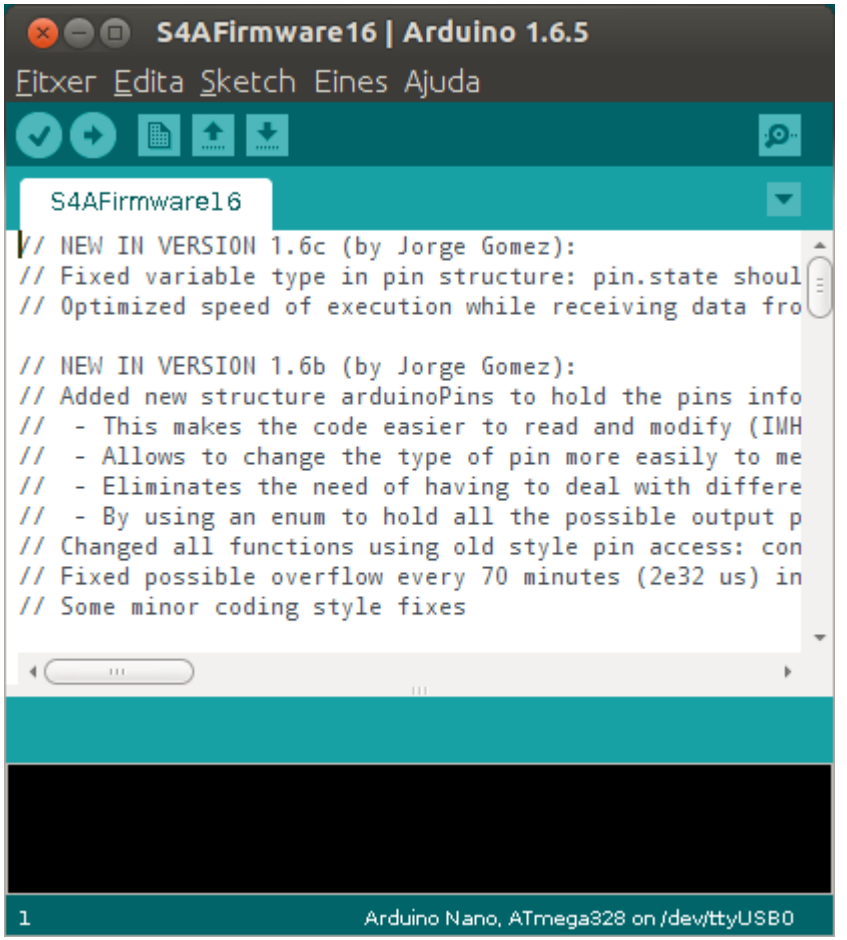
www.s4a.cat

S4A Progamming Learning Board

Microprogramari de l'S4A

El microprogramari és el programari del maquinari

Català	*Anglès*
Programari	**Software**
Maquinari	**Hardware**
Microprogramari	**Firmware**



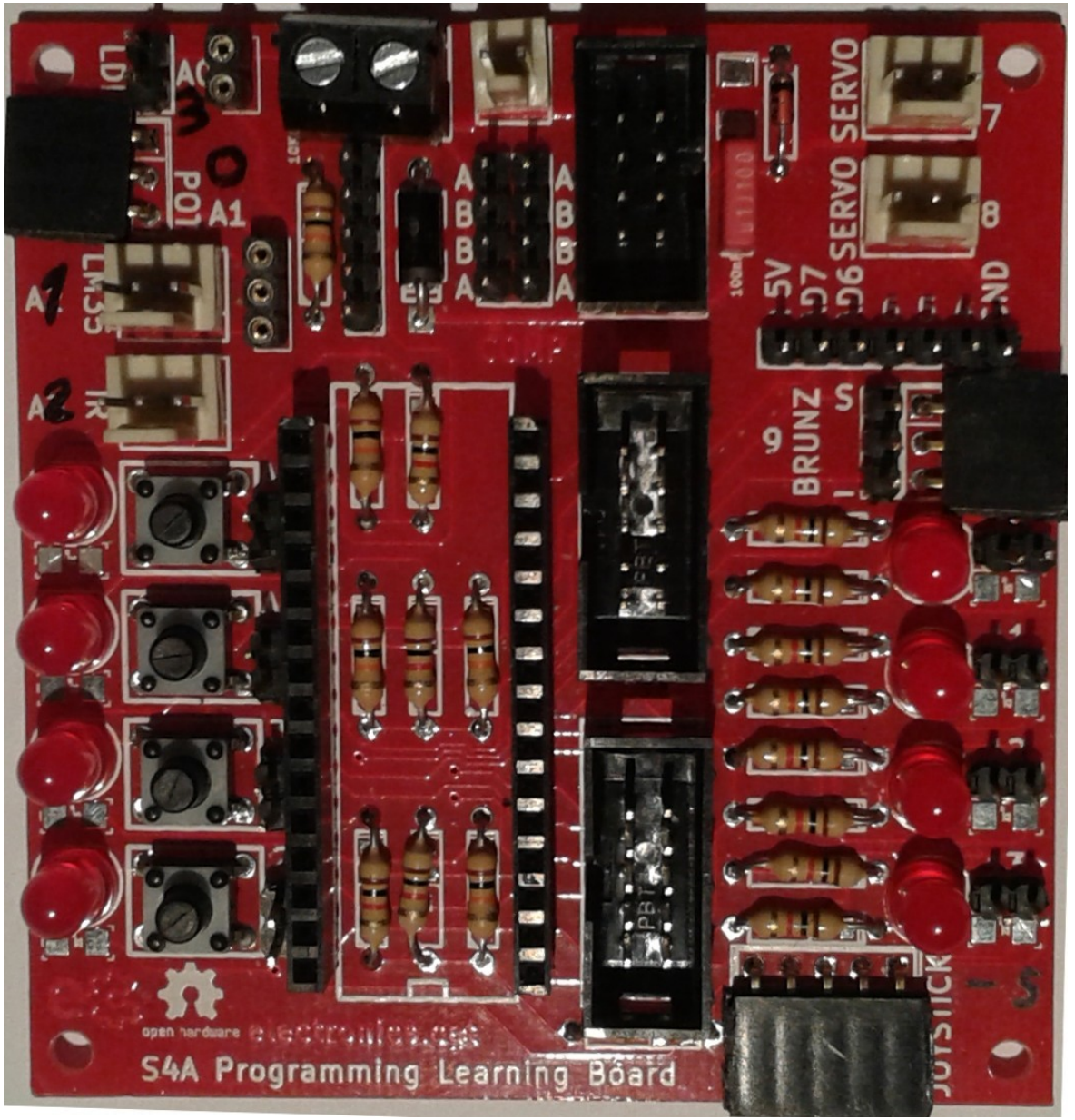
ARDUINO

Arduino Nano

Microprogramari per l'Arduino per funcionar amb l'S4A :
http://vps34736.ovh.net/S4A/S4AFirmware16.ino

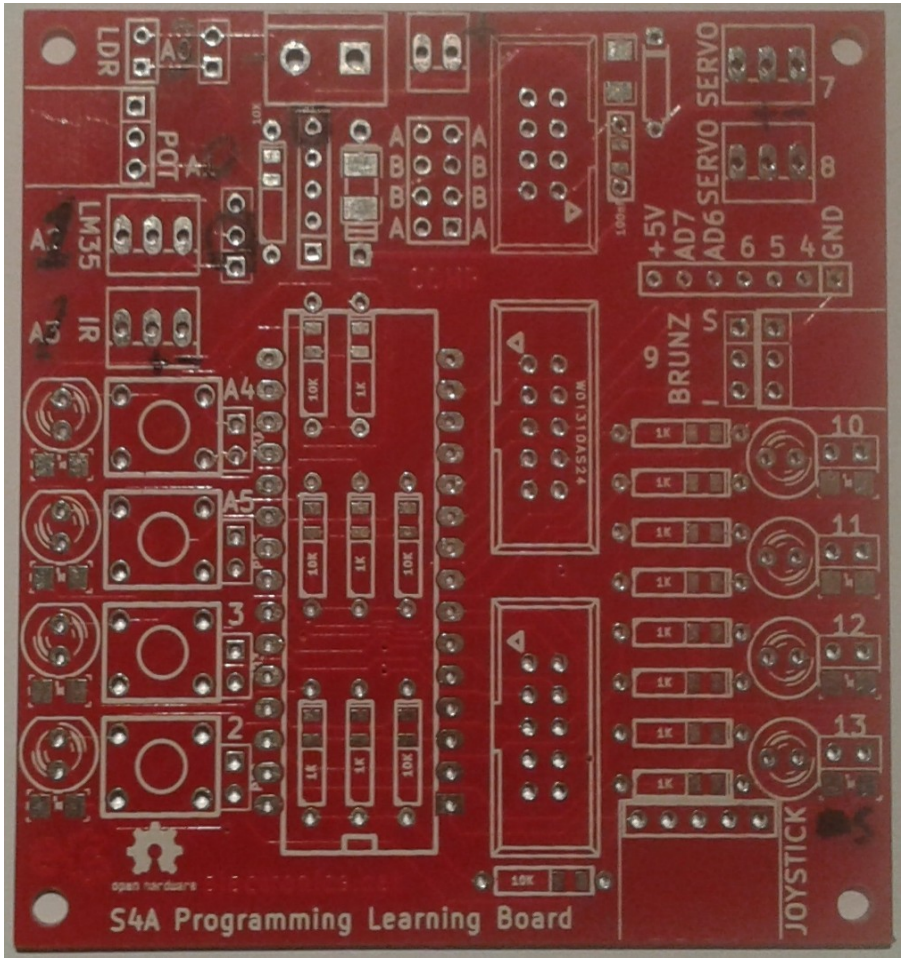
S4A Progamming Learning Board

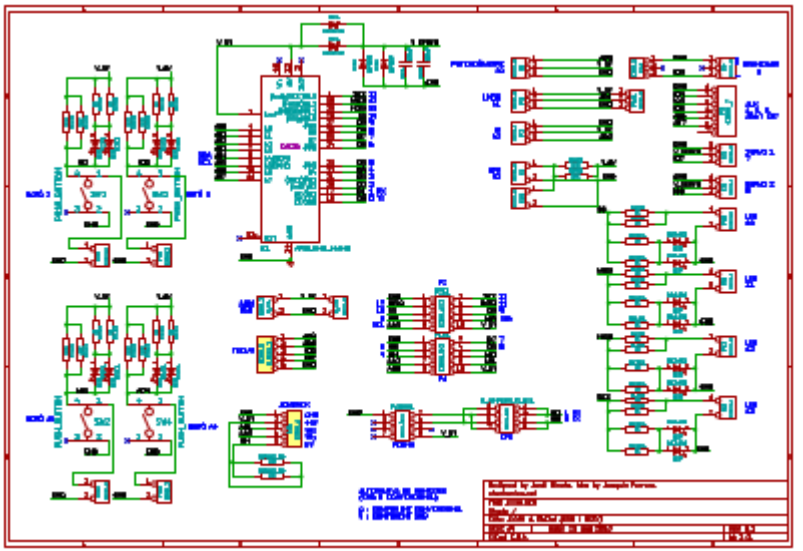
La placa

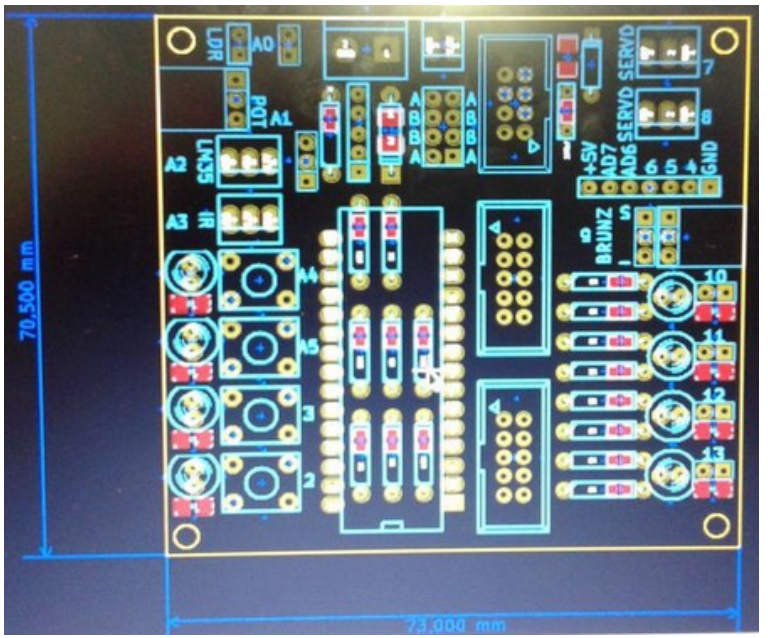


S4A Progamming Learning Board

La placa





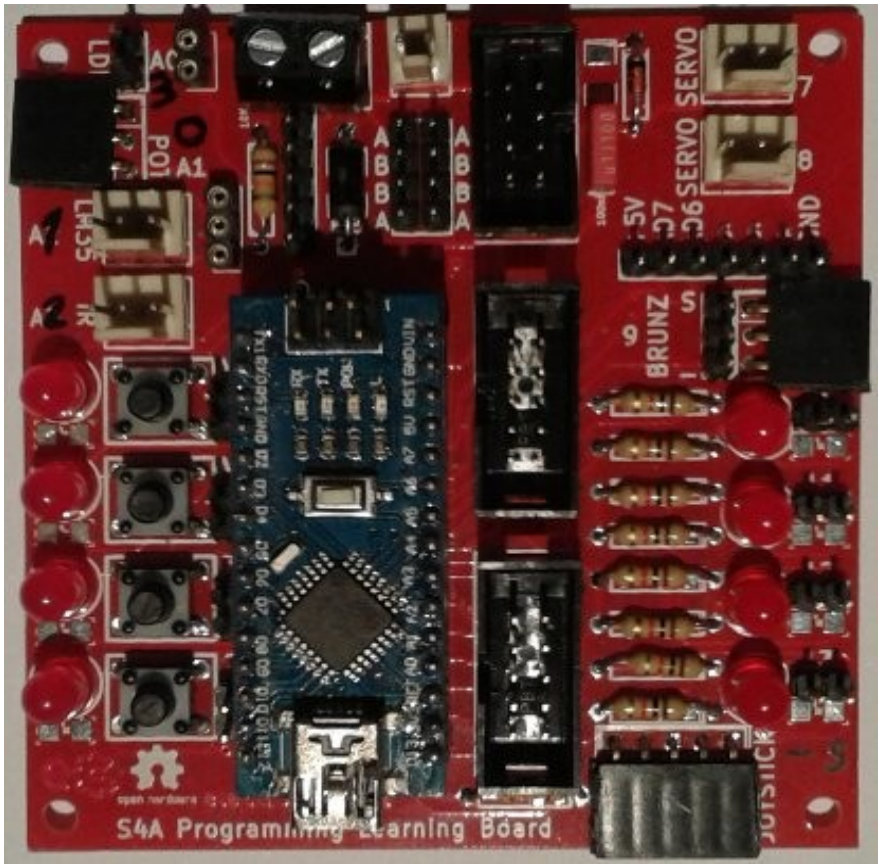


Placa desenvolupada amb l'entorn de disseny integrat de programari lliure KiCad

S4A Progamming Learning Board

Botons i leds

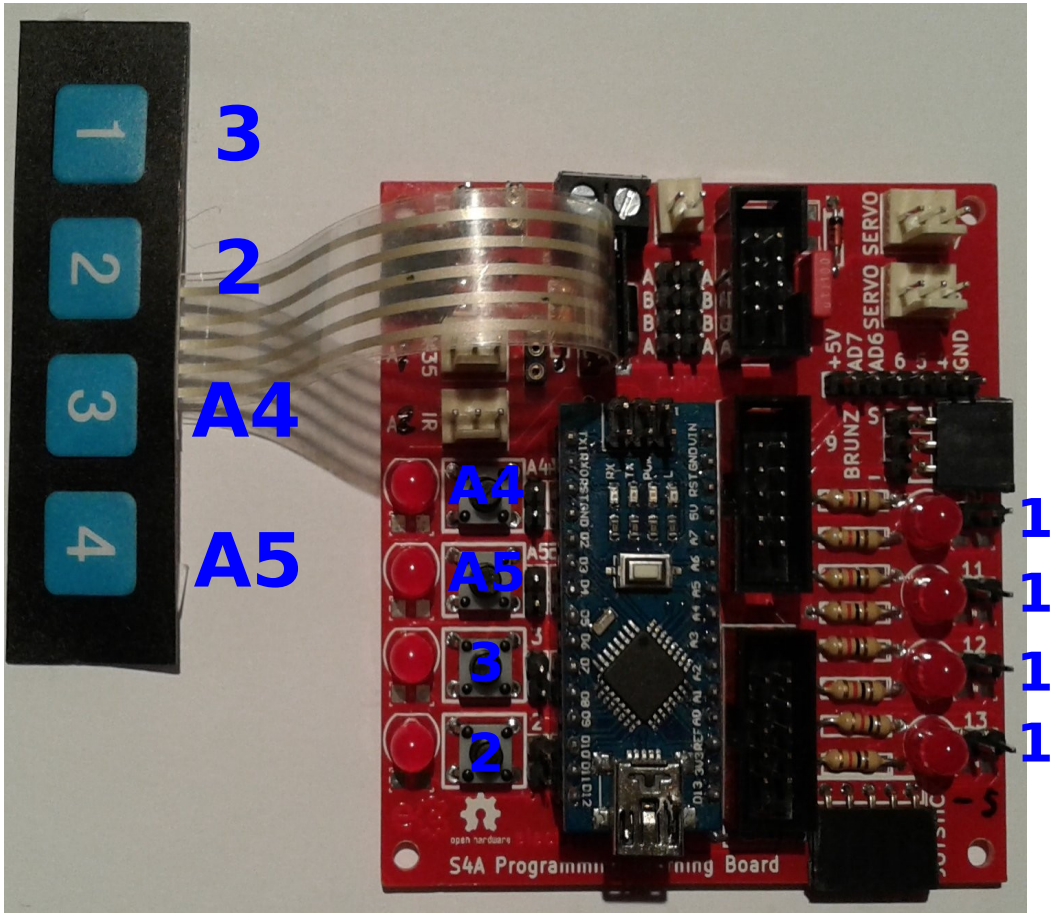
A4
A5
3
2



10
11
12
13

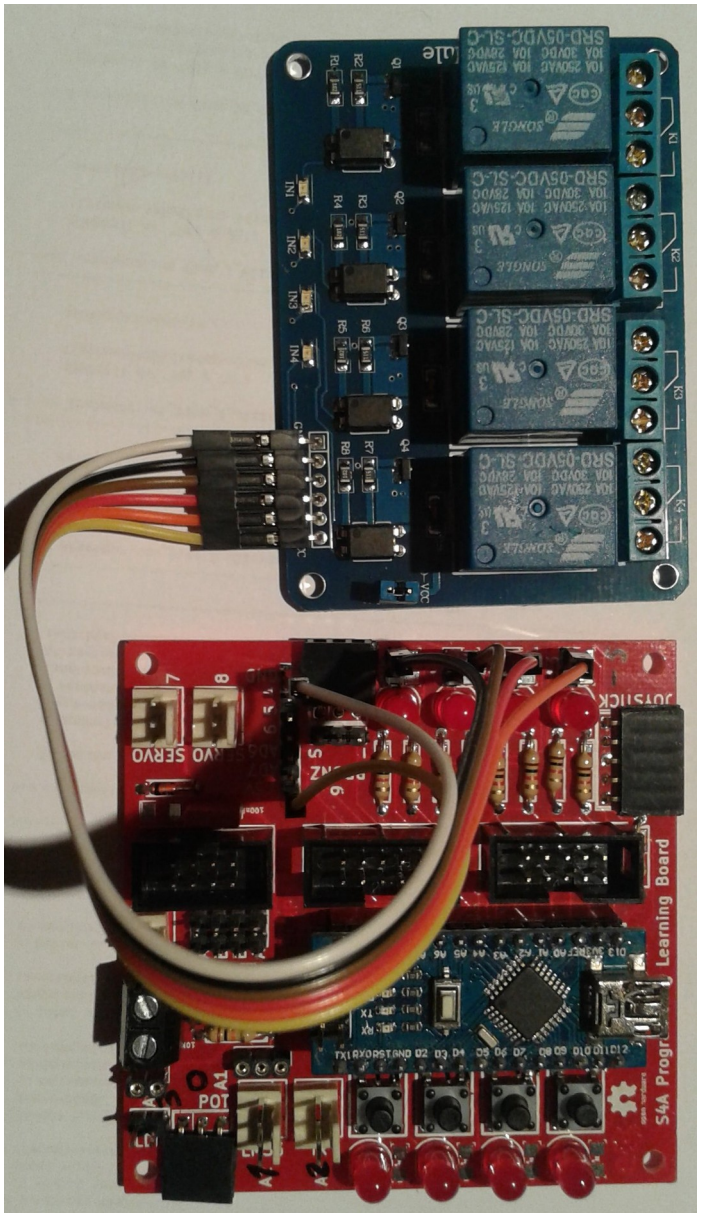
S4A Progamming Learning Board

Teclat de membrana i leds



S4A Progamming Learning Board

Botons, leds i relés



S4A Progamming Learning Board

Concepte de relé

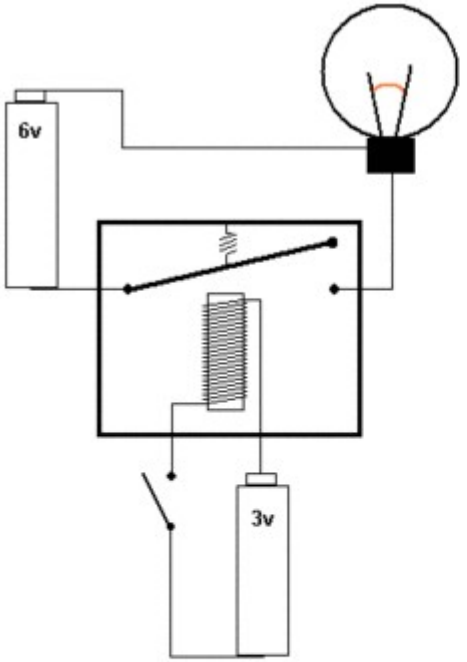


Figure 1: Relay off

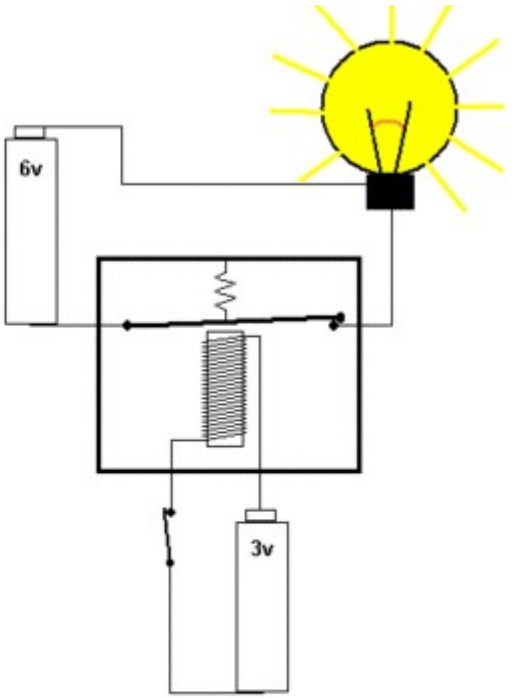
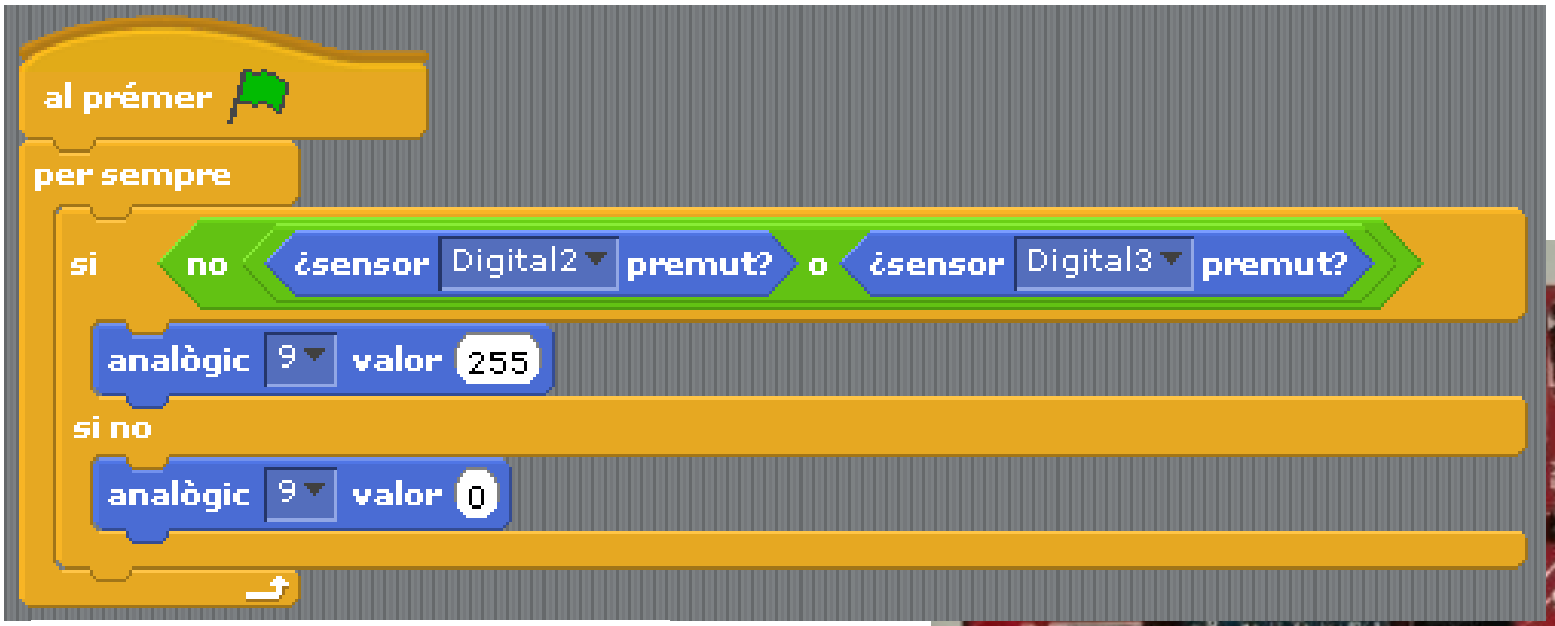
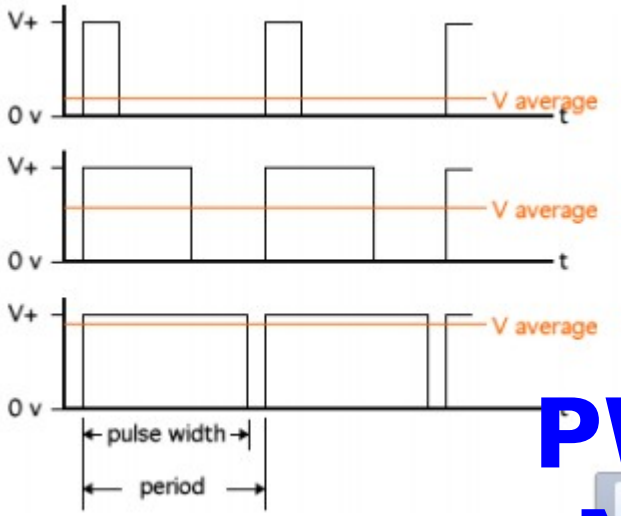


Figure 2: Relay on

S4A Progamming Learning Board

Botons i brunzidor





A4

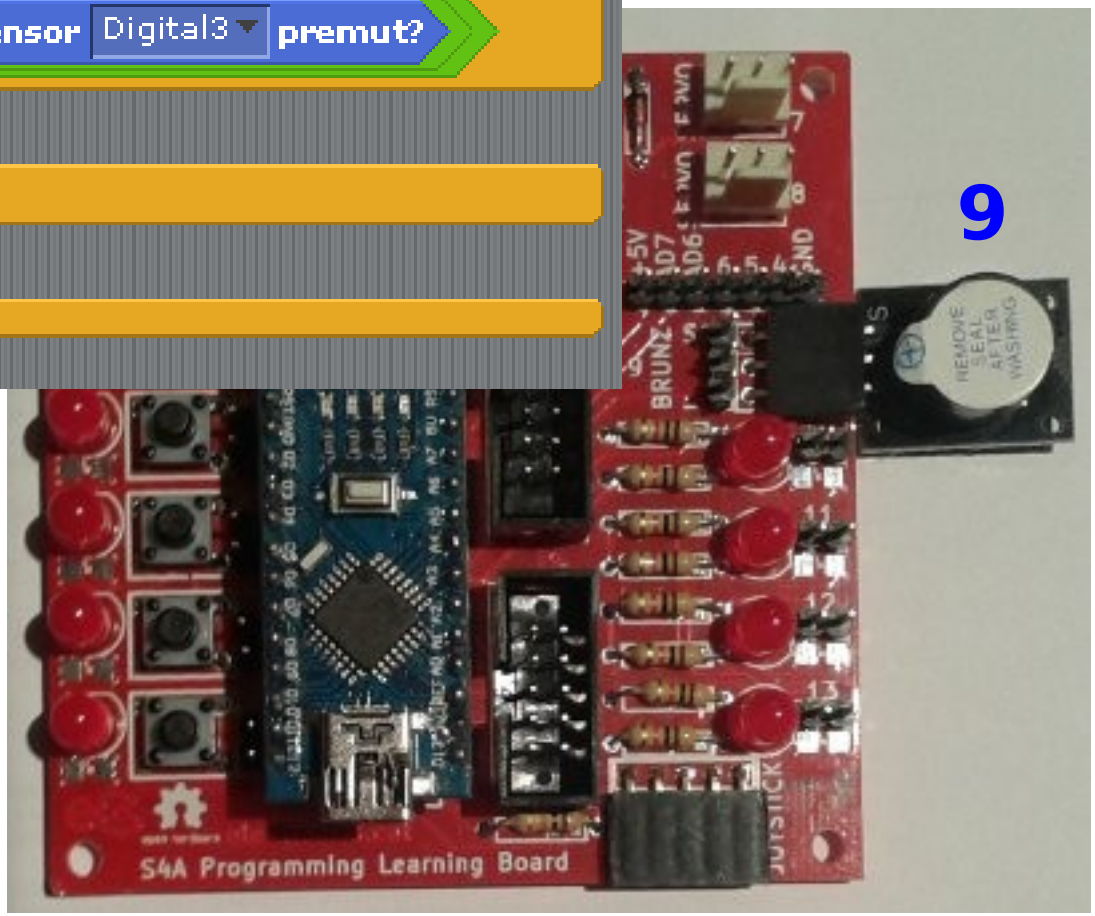
A5

3

2

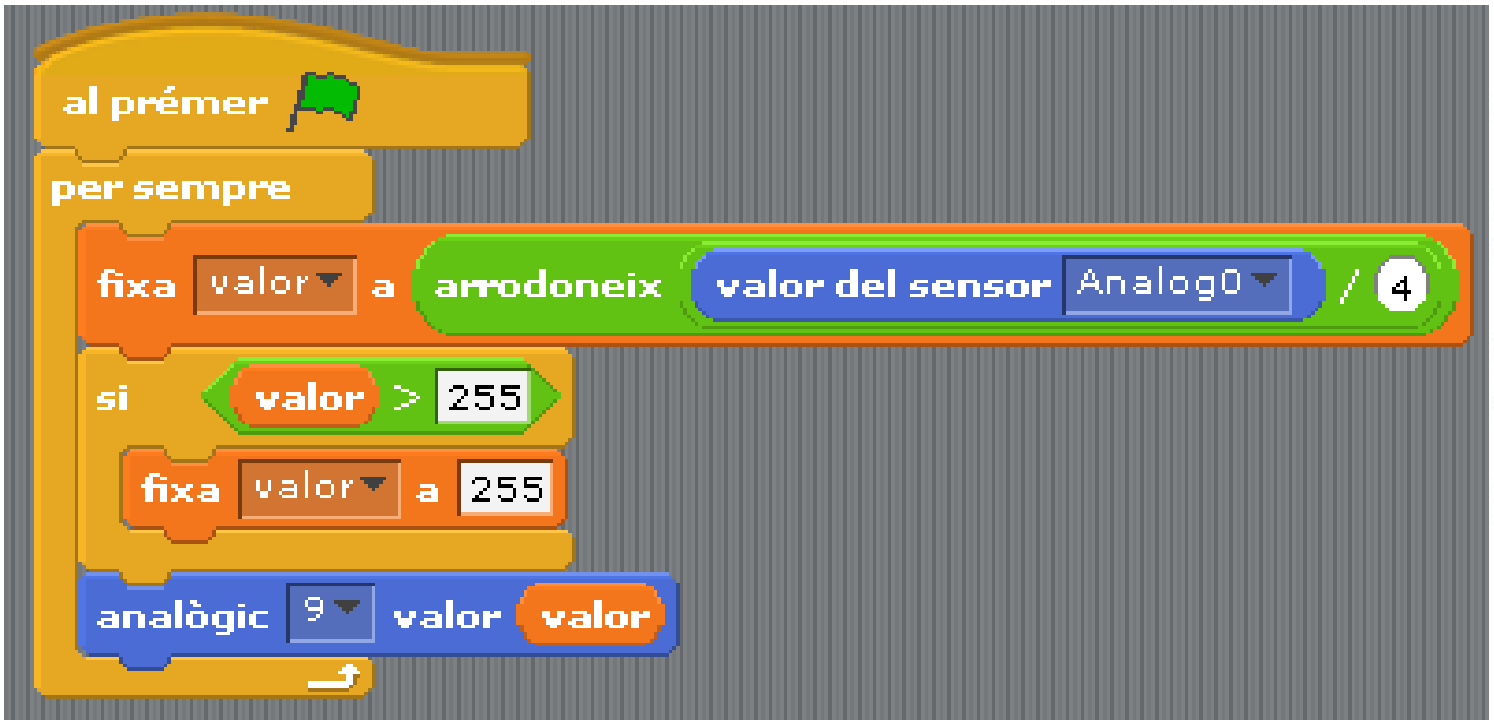
PW

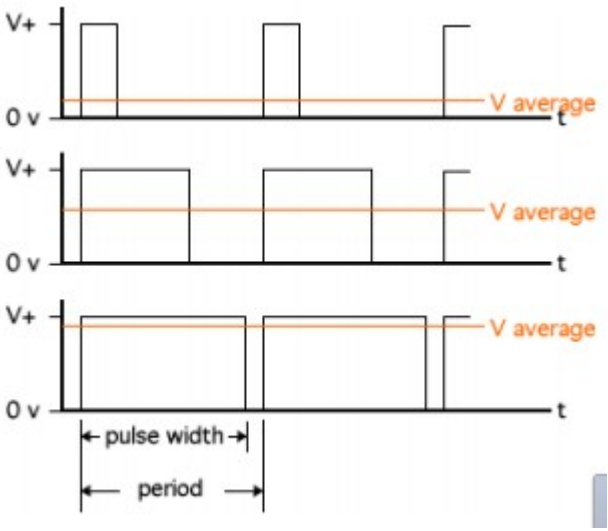
M



S4A Progamming Learning Board

Potenciòmetre i brunzidor



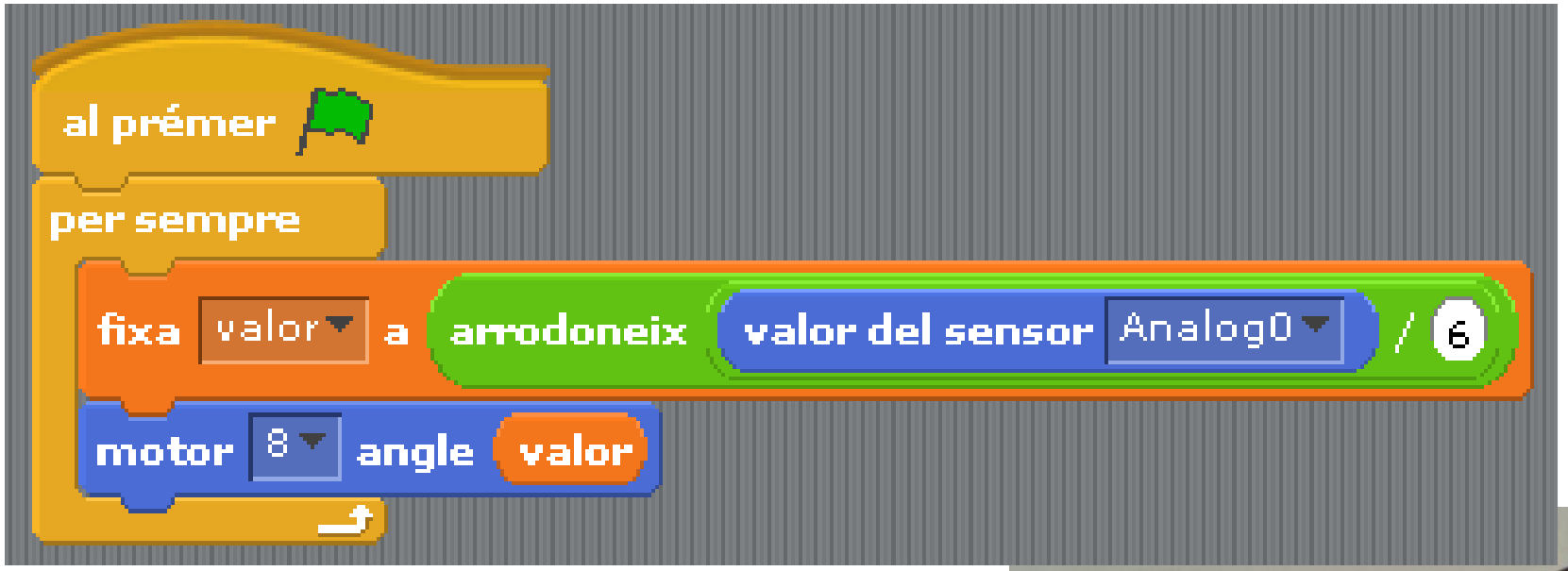


A0

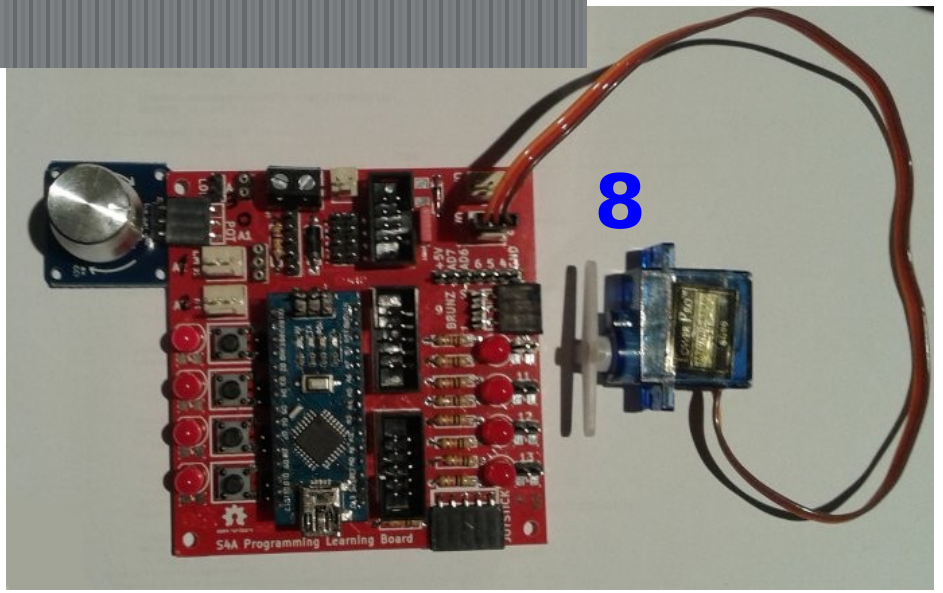
9

S4A Progamming Learning Board

Potenciòmetre i servomotor

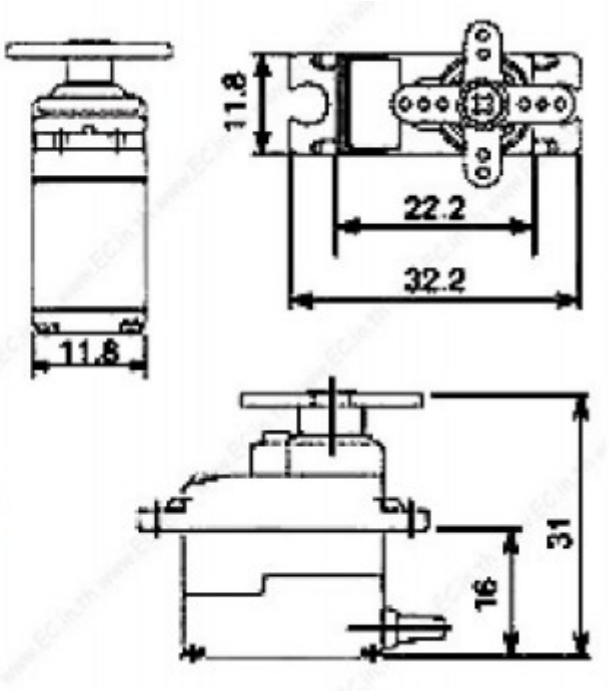


A0



S4A Progamming Learning Board

Servo



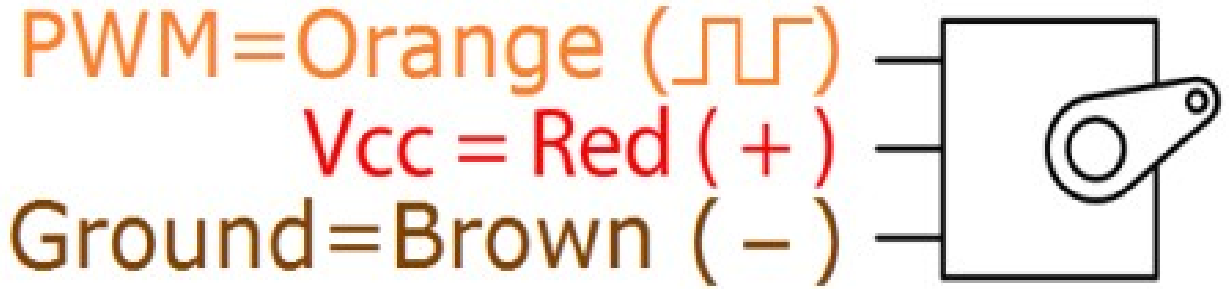
Specifications

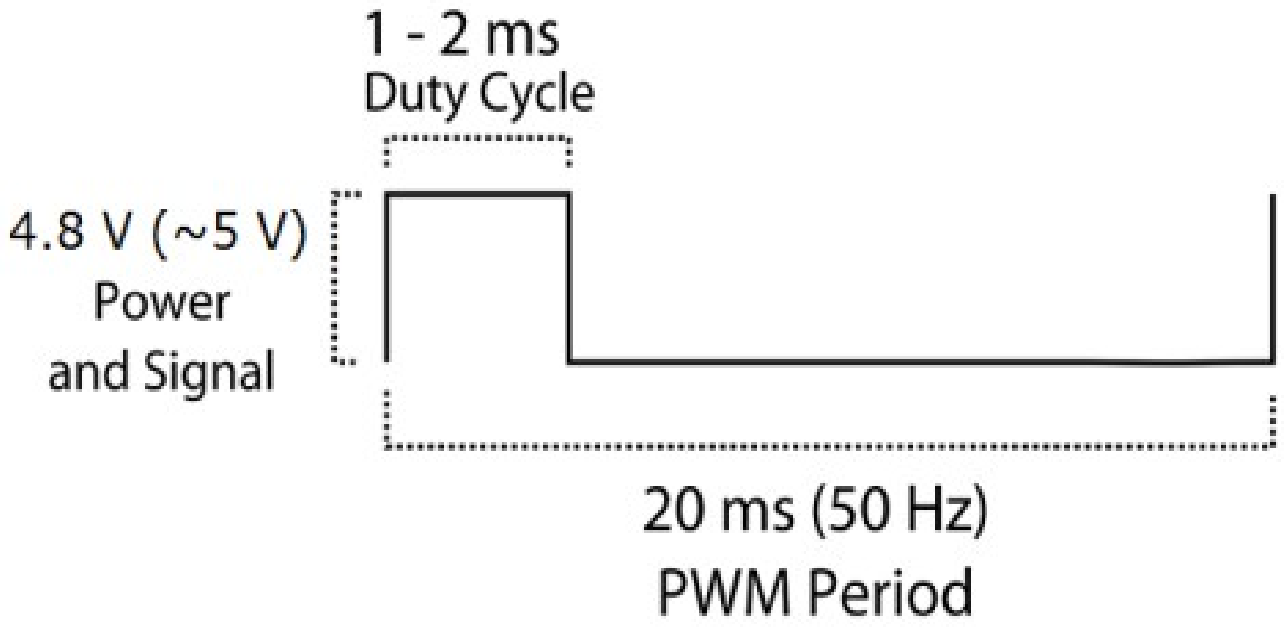
- Weight: 9 g
- Dimension: 22.2 x 11.8 x 31 mm approx.
- Stall torque: 1.8 kgf·cm
- Operating speed: 0.1 s/60 degree
- Operating voltage: 4.8 V (~5V)
- Dead band width: 10 µs
- Temperature range: 0 ºC – 55 ºC

http://datasheet.sparkgo.com.br/SG90Servo.pdf

S4A Progamming Learning Board

Servo



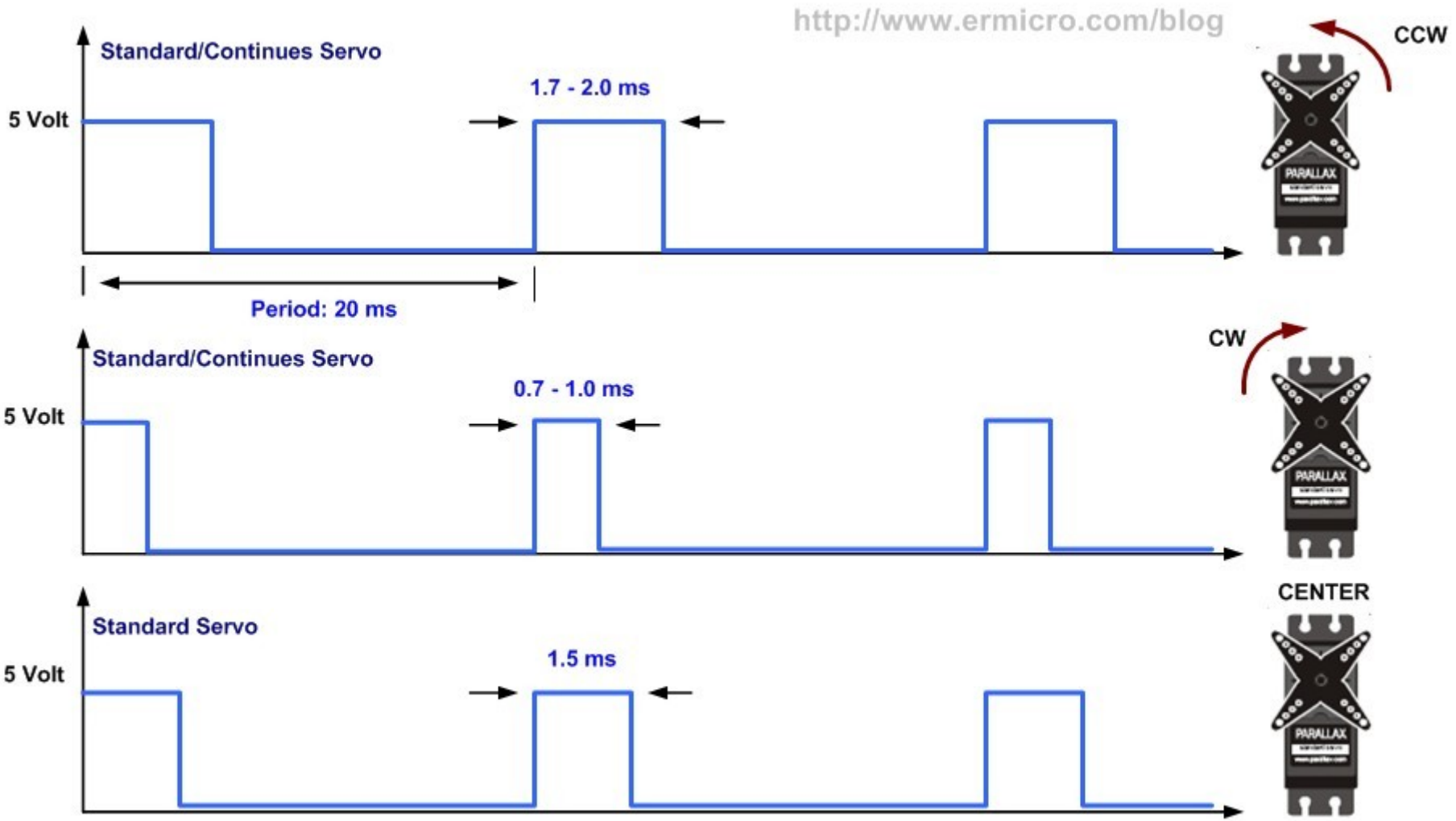


Position "0" (1.5 ms pulse) is middle, "90" (~2 ms pulse) is all the way to the right, "-90" (~1 ms pulse) is all the way to the left.

http://datasheet.sparkgo.com.br/SG90Servo.pdf

S4A Progamming Learning Board

Servo

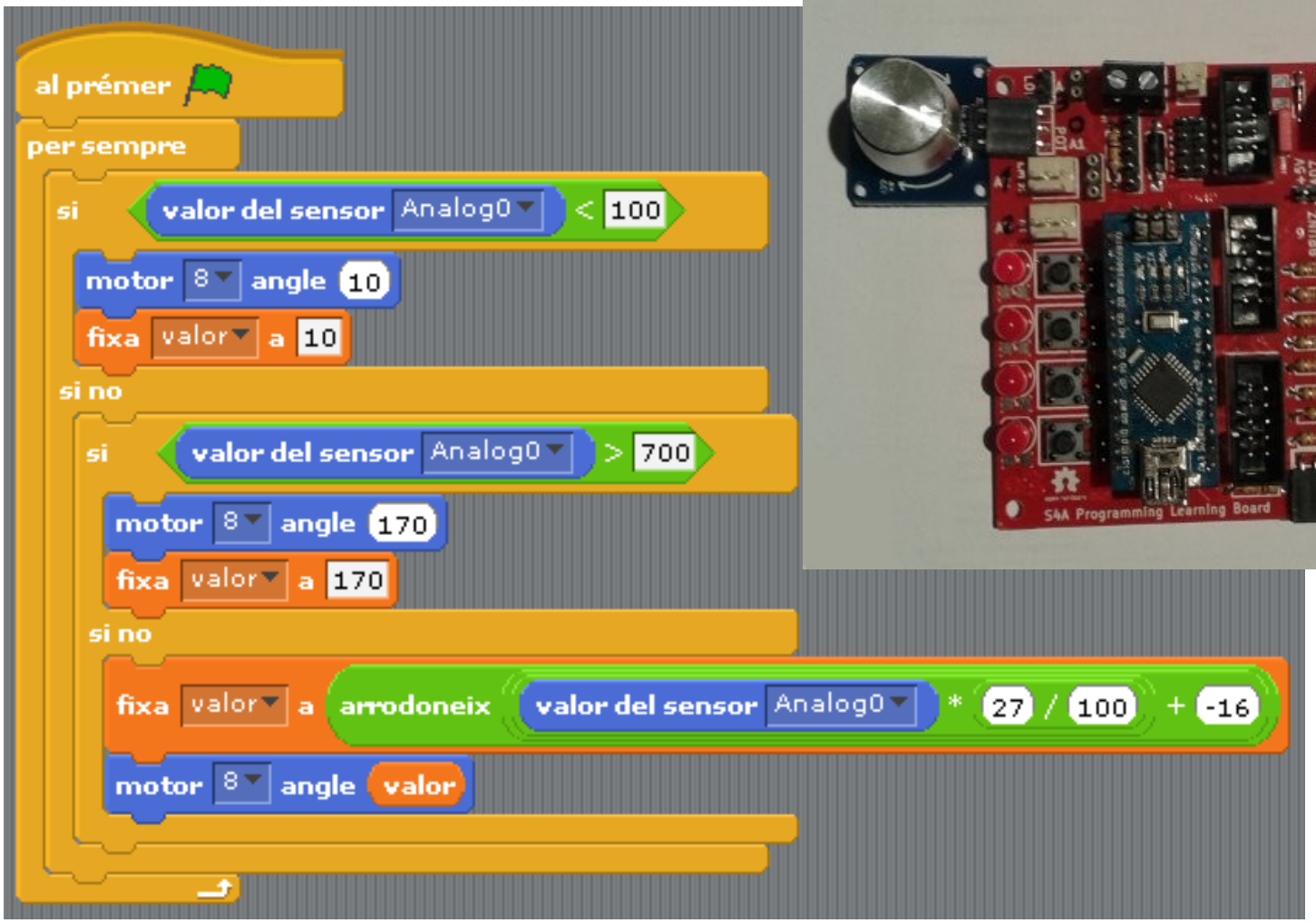


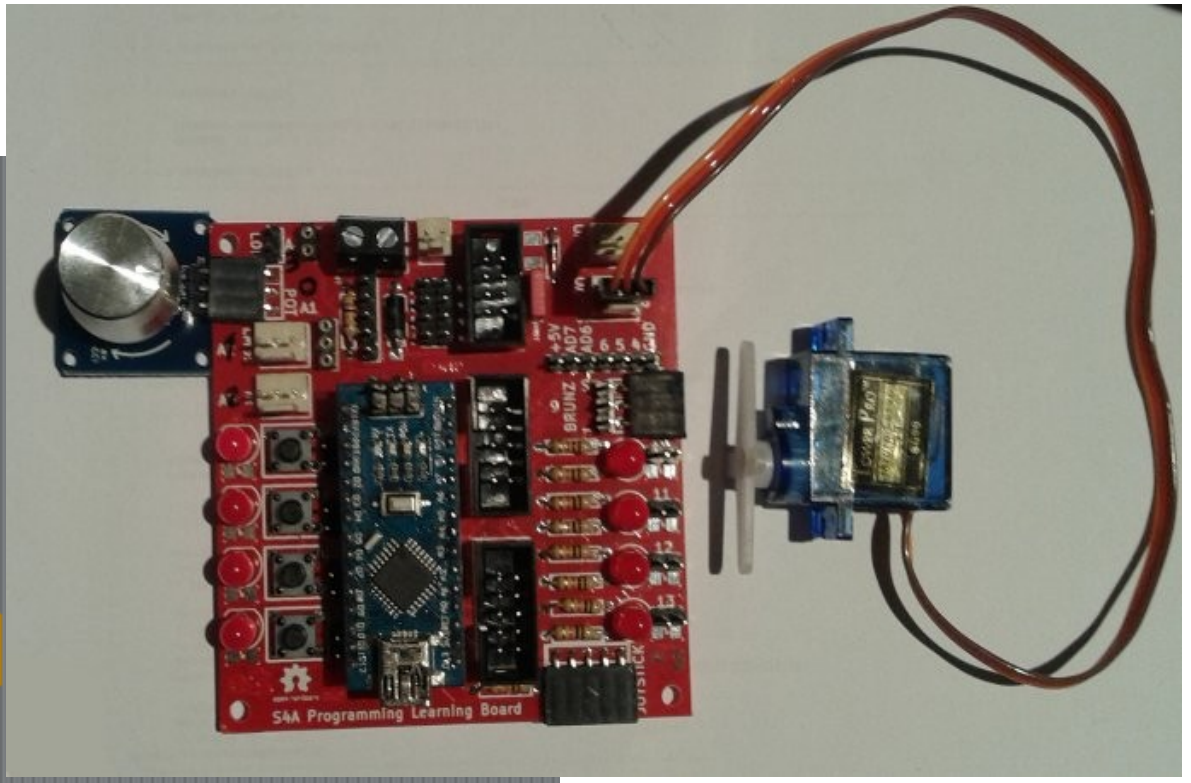
Servo Motor PWM Timing Diagram

http://www.ermicro.com/blog/wp-content/uploads/2009/02/servo_01.jpg

S4A Progamming Learning Board

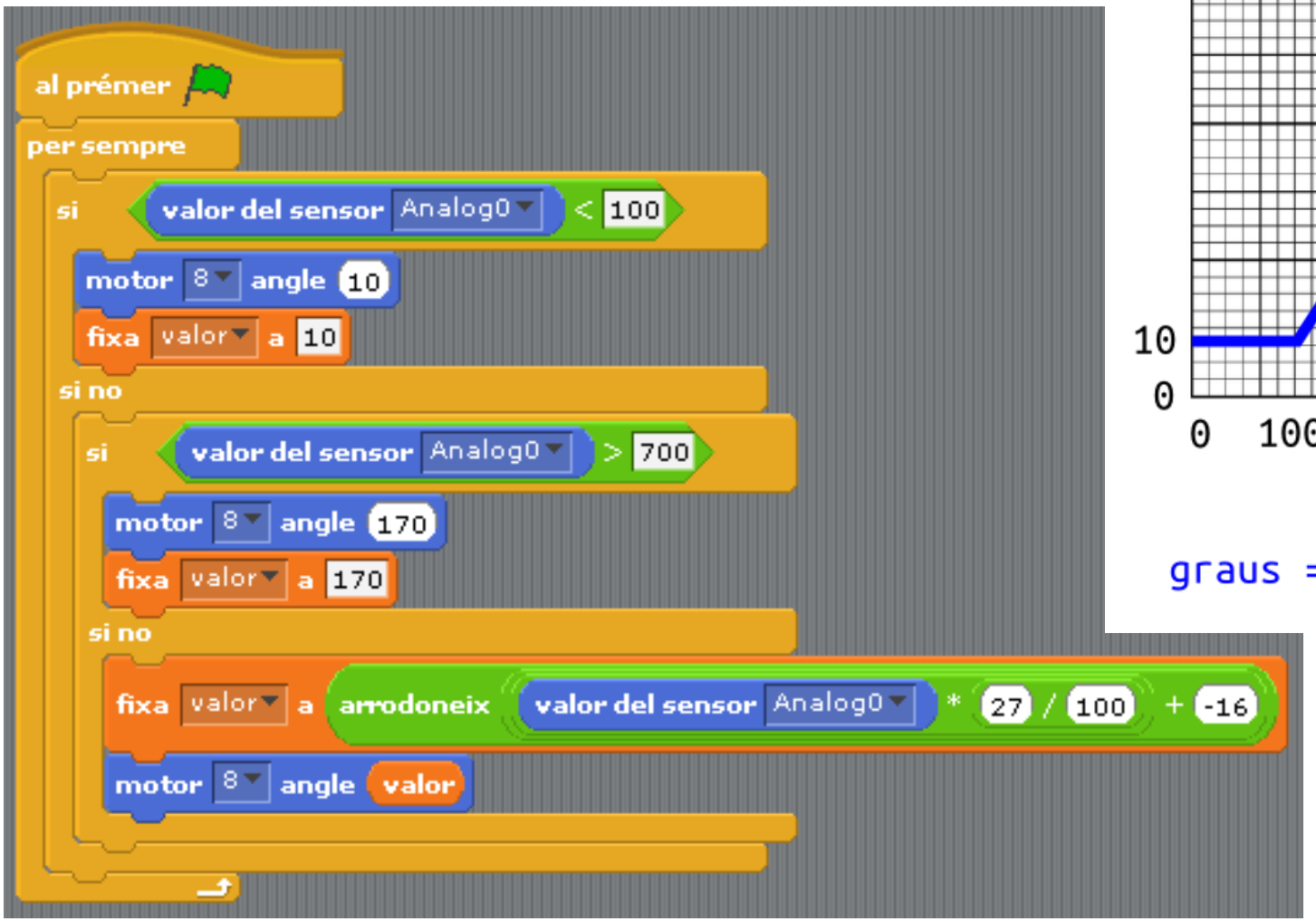
Potenciòmetre i servomotor

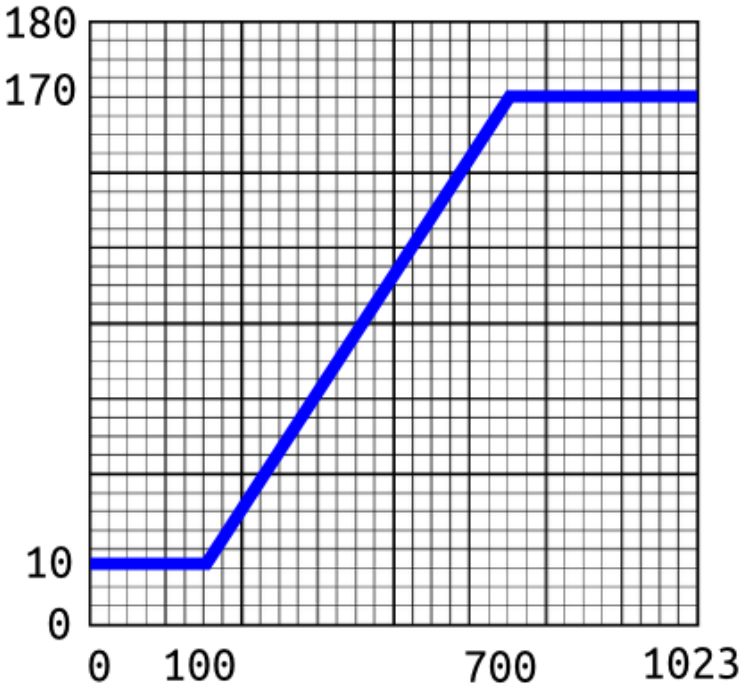




S4A Progamming Learning Board

Potenciòmetre i servomotor

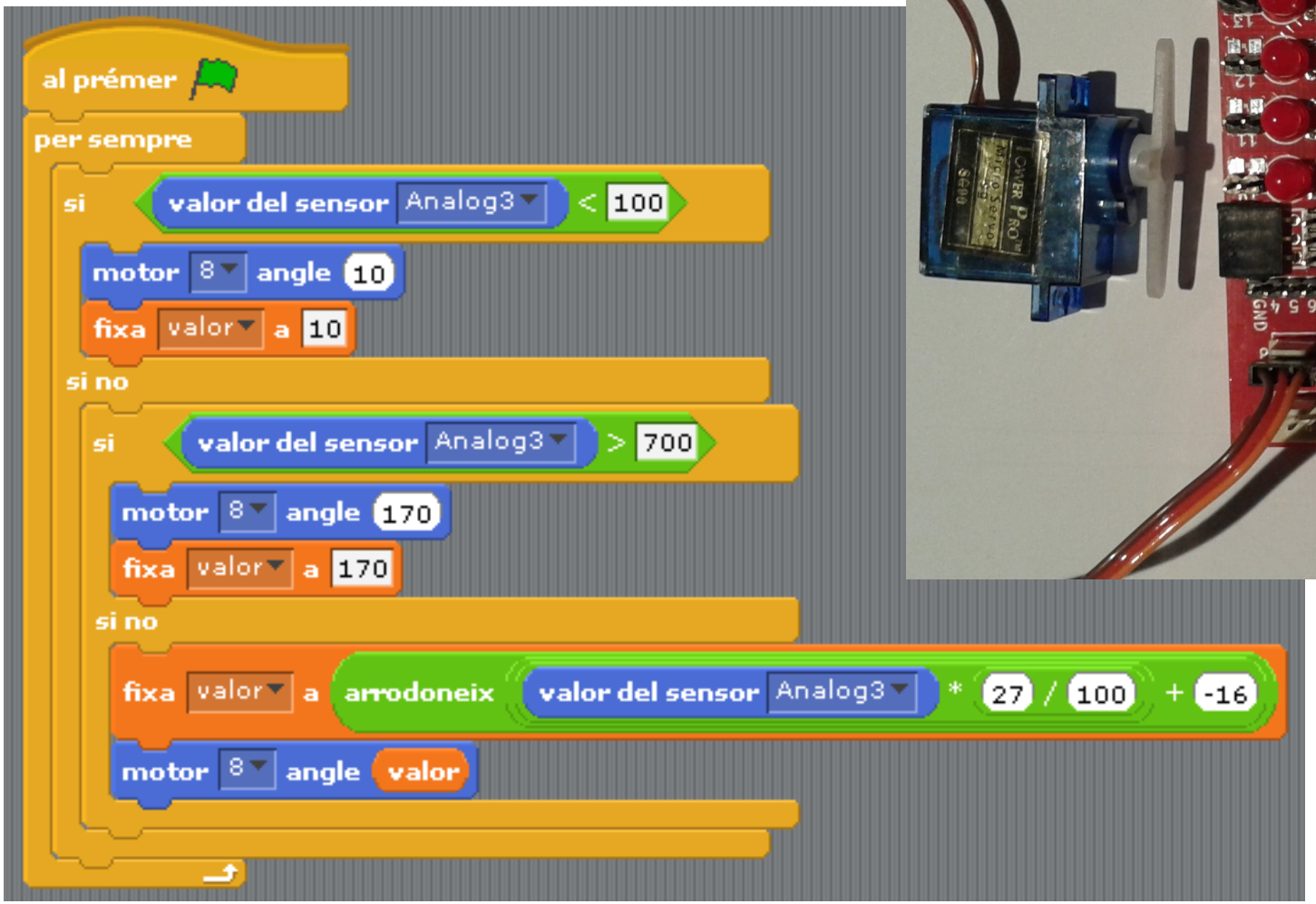


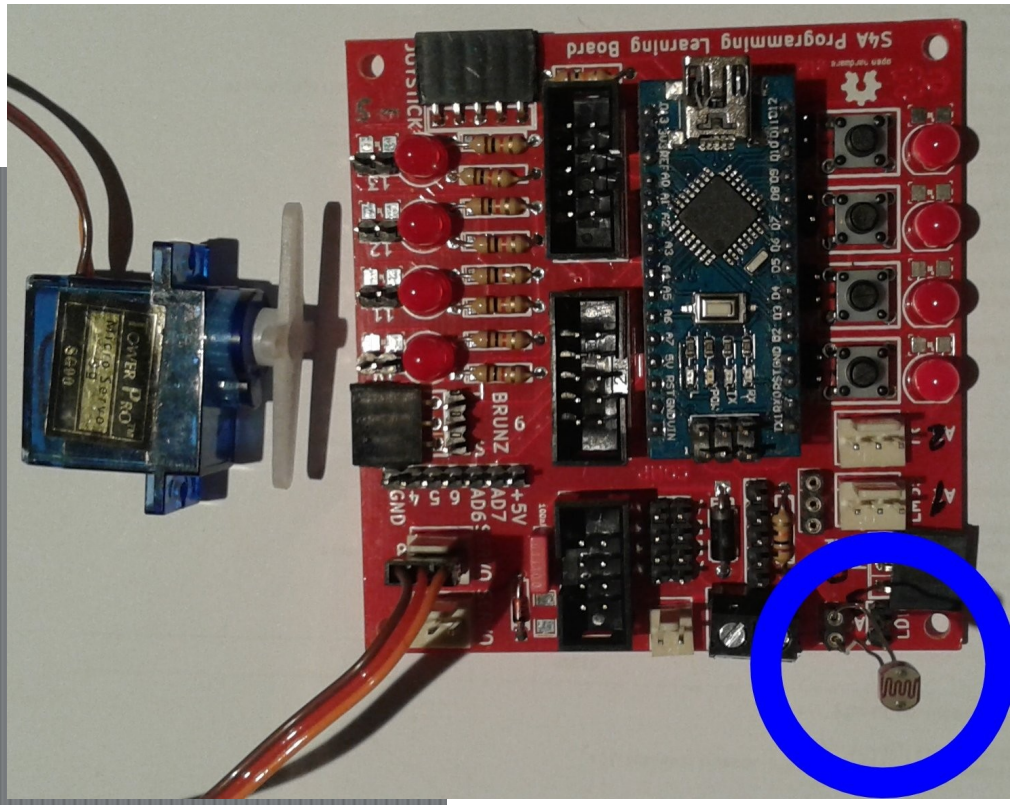


$$graus = Analog0 \frac{27}{100} - 16$$

S4A Progamming Learning Board

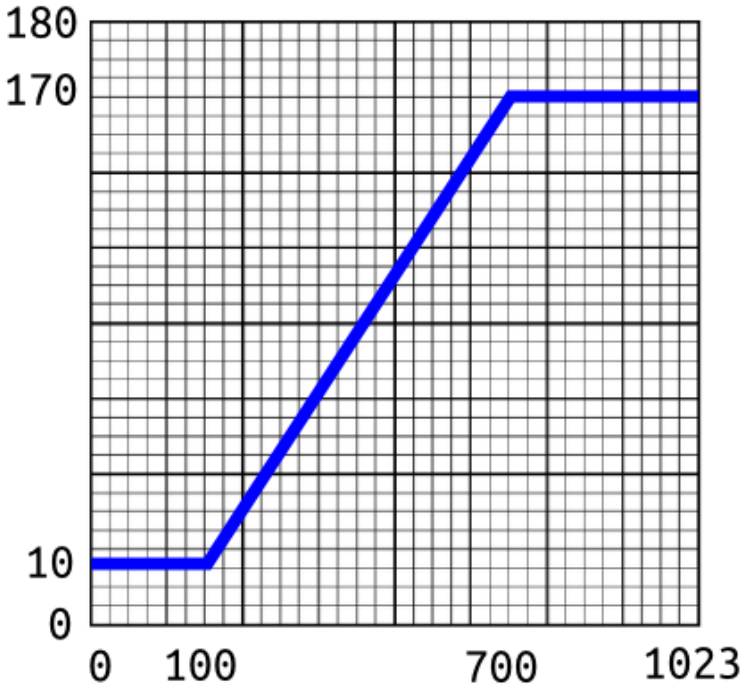
LDR i servomotor





S4A Progamming Learning Board

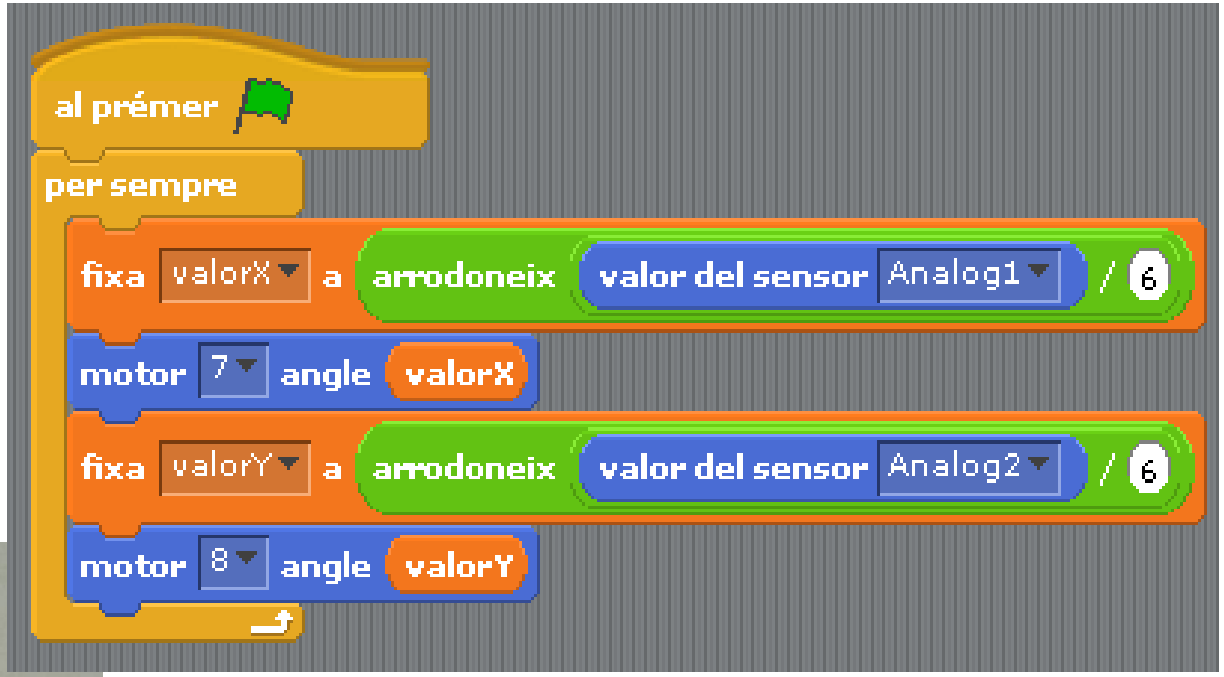
LDR i servomotor

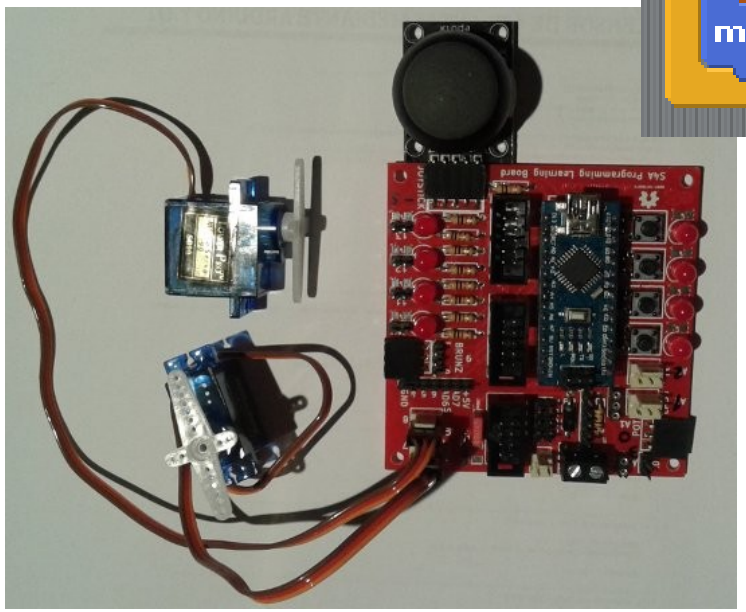


$$graus = Analog0 \frac{27}{100} - 16$$

S4A Progamming Learning Board

Joystick i servomotors

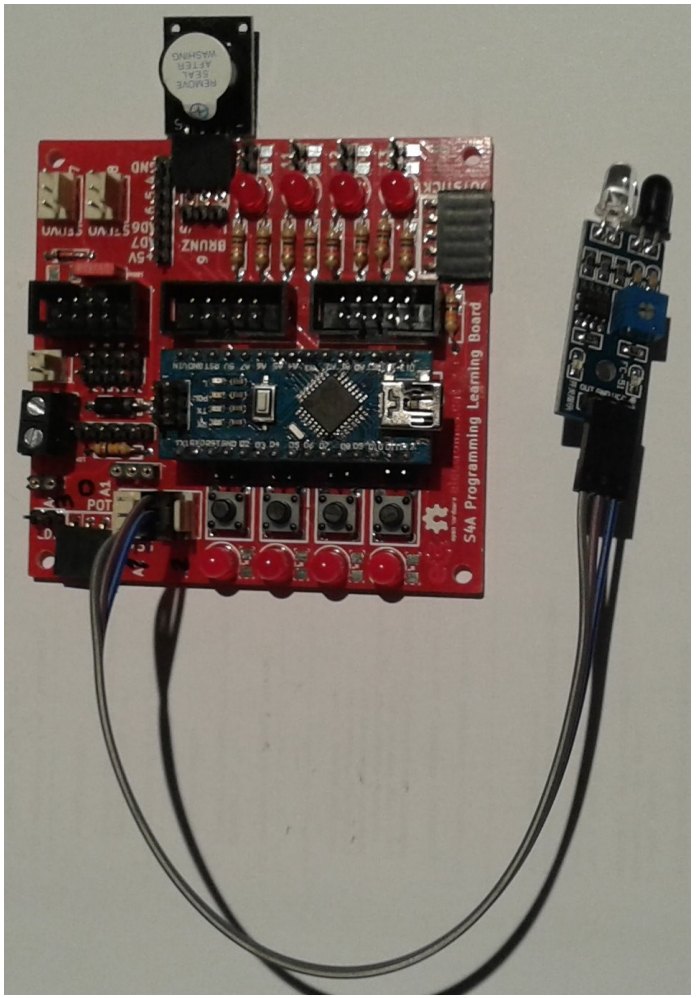




Per a fer servir el joystick desconnecteu el sensor de temperatura i el sensor infraroig

S4A Progamming Learning Board

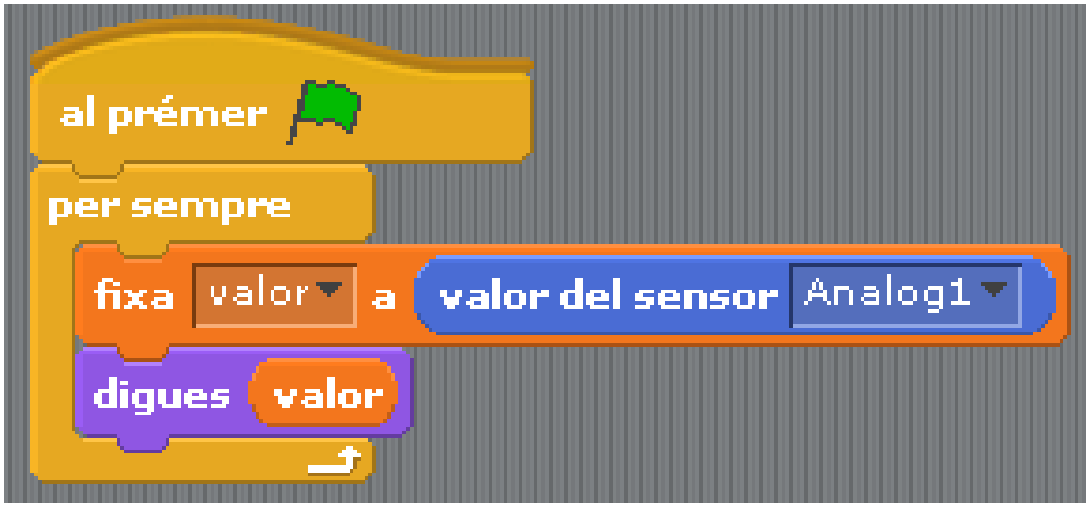
Sensor d'infrarojos i brunzidor

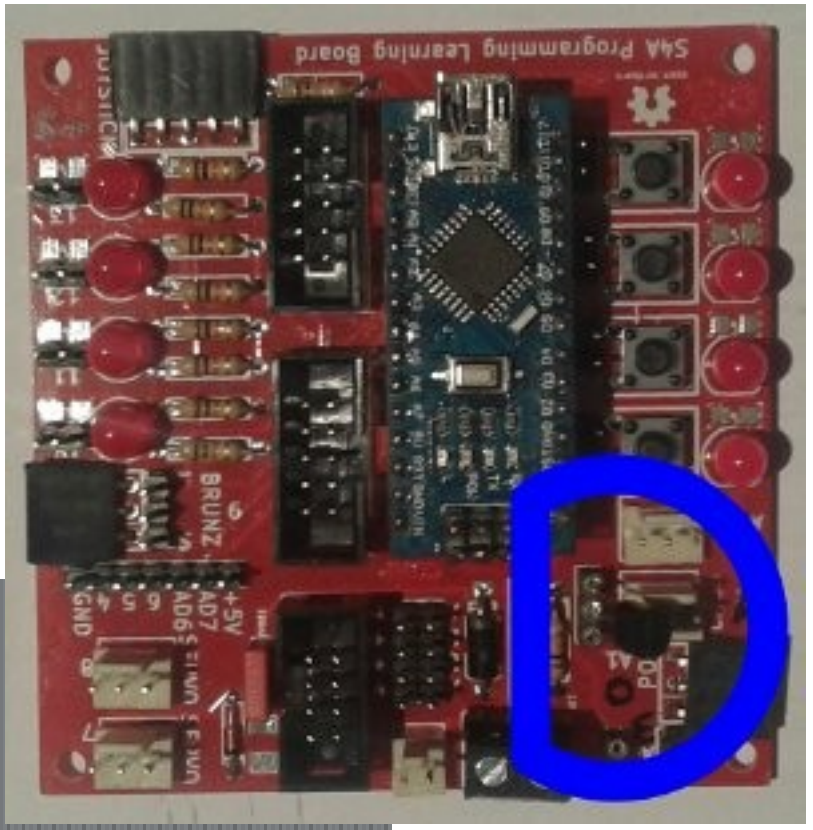


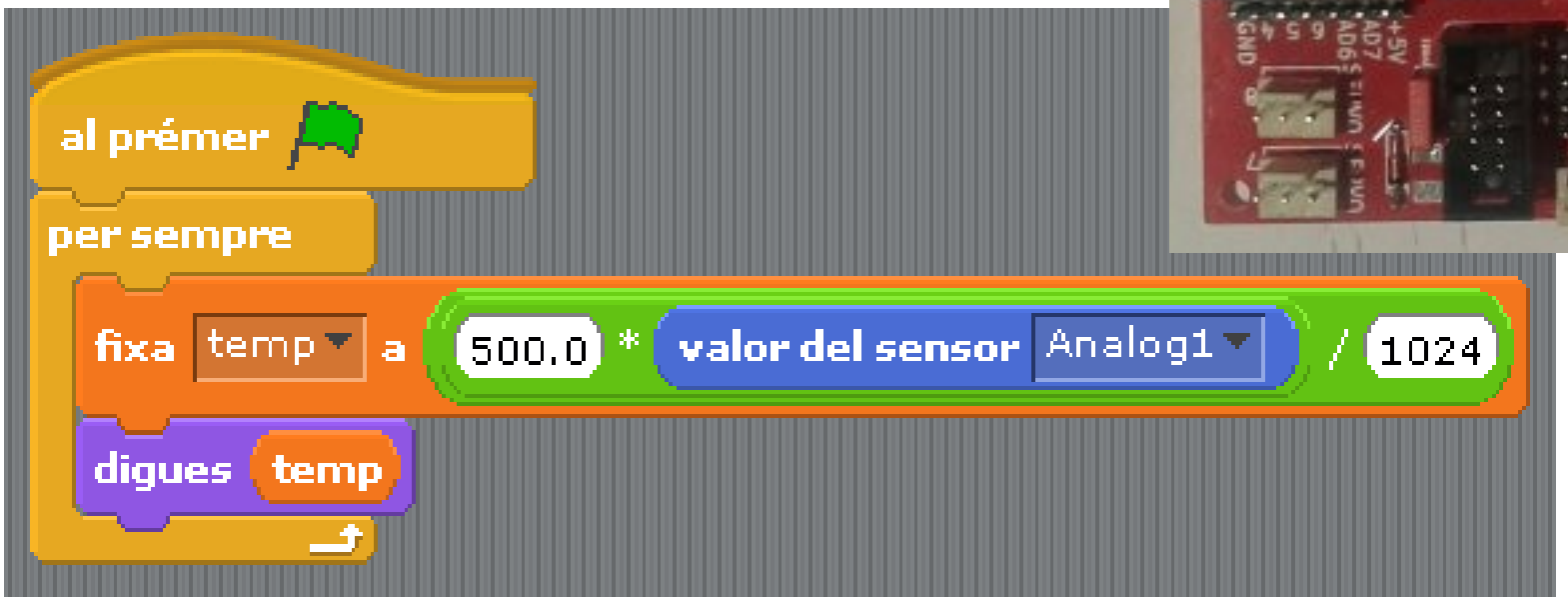
Per a fer servir el sensor infraroig desconnecteu el joystick

S4A Progamming Learning Board

Sensor de temperatura LM35

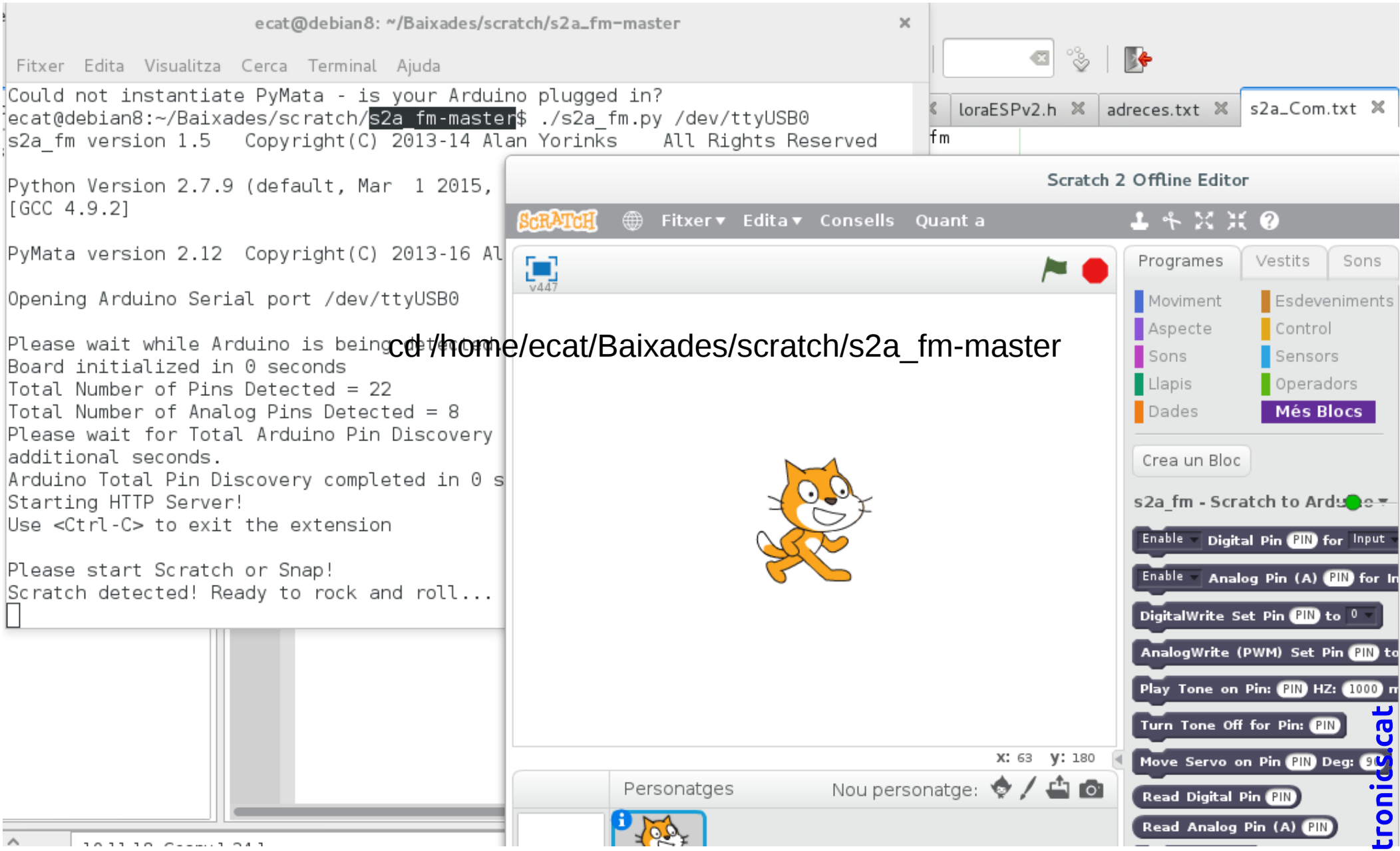






Per a fer servir el sensor de temperatura desconnecteu el joystick

Scratch 2 Offline Editor



cd /home/ecat/Baixades/scratch/s2a_fm-master

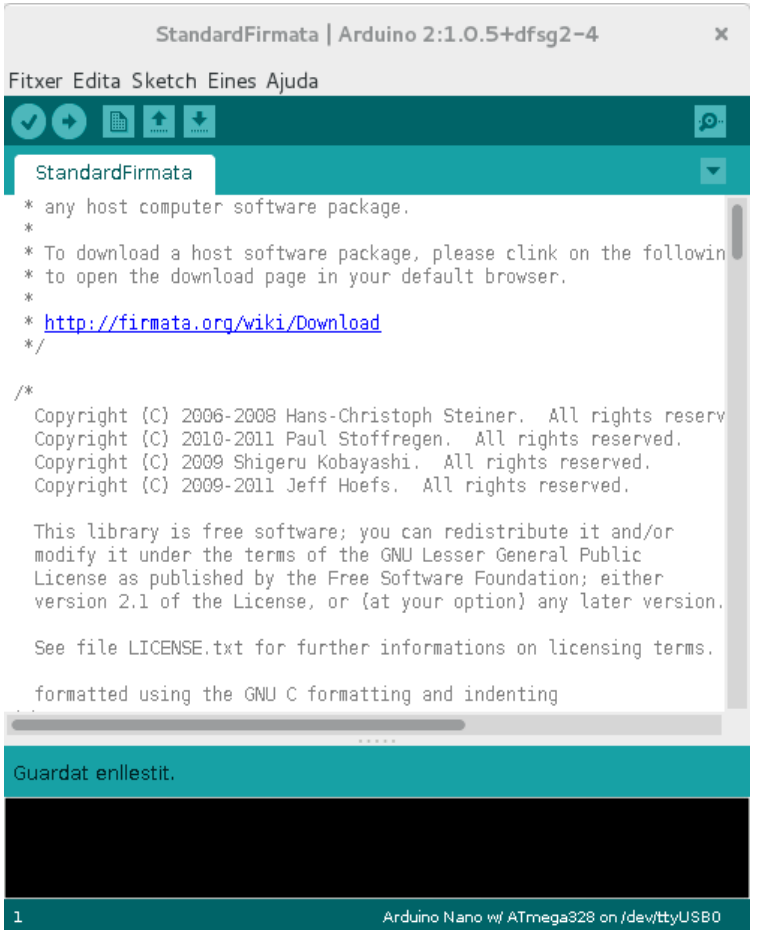
https://github.com/MrYsLab/s2a_fm

S4A Progamming Learning Board
Microprogramari per l'Scratch 2

El microprogramari és el programari del maquinari

Català	*Anglès*
Programari	**Software**
Maquinari	**Hardware**
Microprogramari	**Firmware**

Arduino Nano



Microprogramari per l'Arduino per funcionar amb l'Scratch 2 Offline Editor:
http://binefa.cat/php/training/s4a/StandardFirmata.tar.gz

Scratch 2 Offline Editor

Hardware Extension

s2aio https://github.com/MrYsLab/s2aio/wiki

The Arduino Hardware Extension For Snap! and the Scratch 2.0 Offline Editor

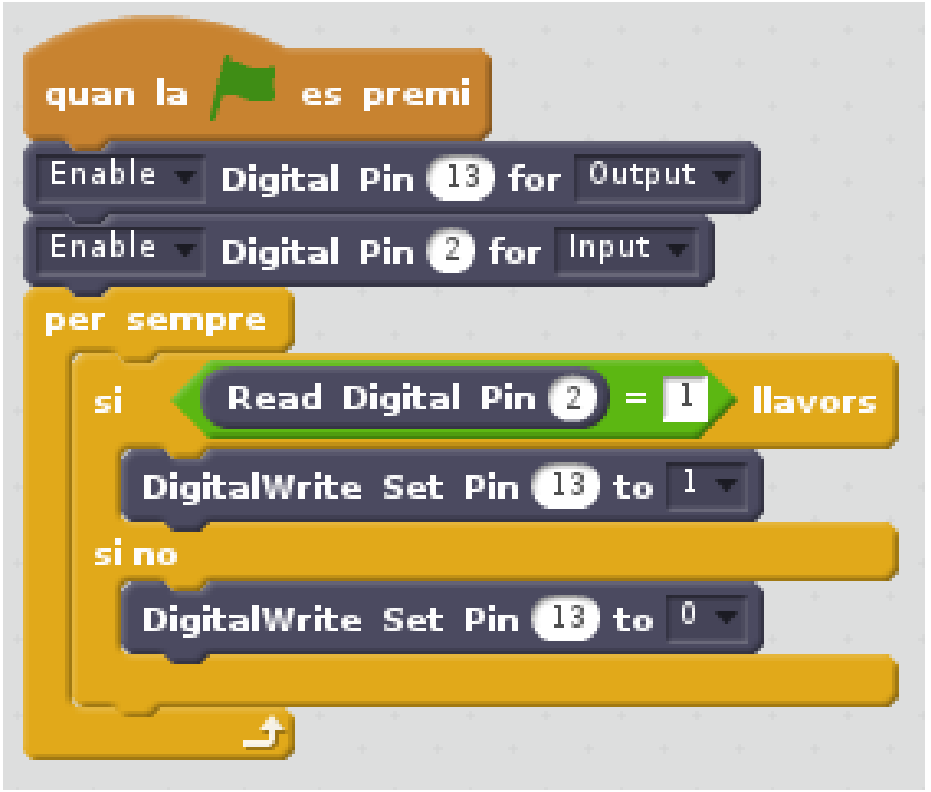
s2a_fm

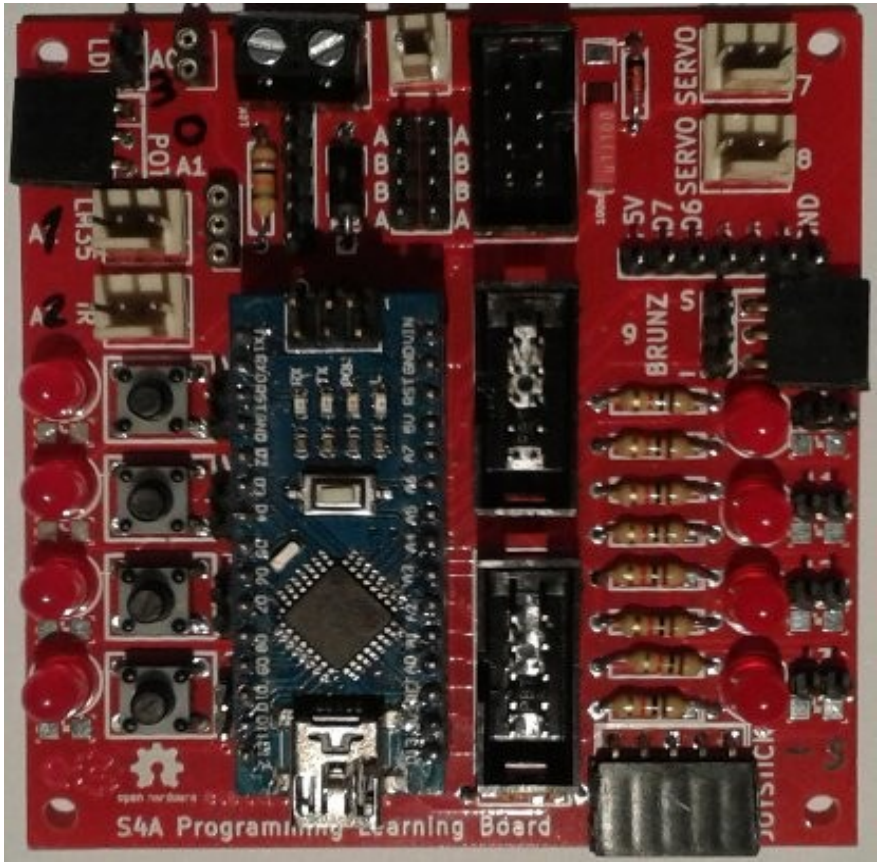
Previous version of ***s2aio*** https://github.com/MrYsLab/s2a_fm

Scratch 2 Offline Editor

Hardware Extension (s2a_fm.s2e)

sc2_prova00.sb2

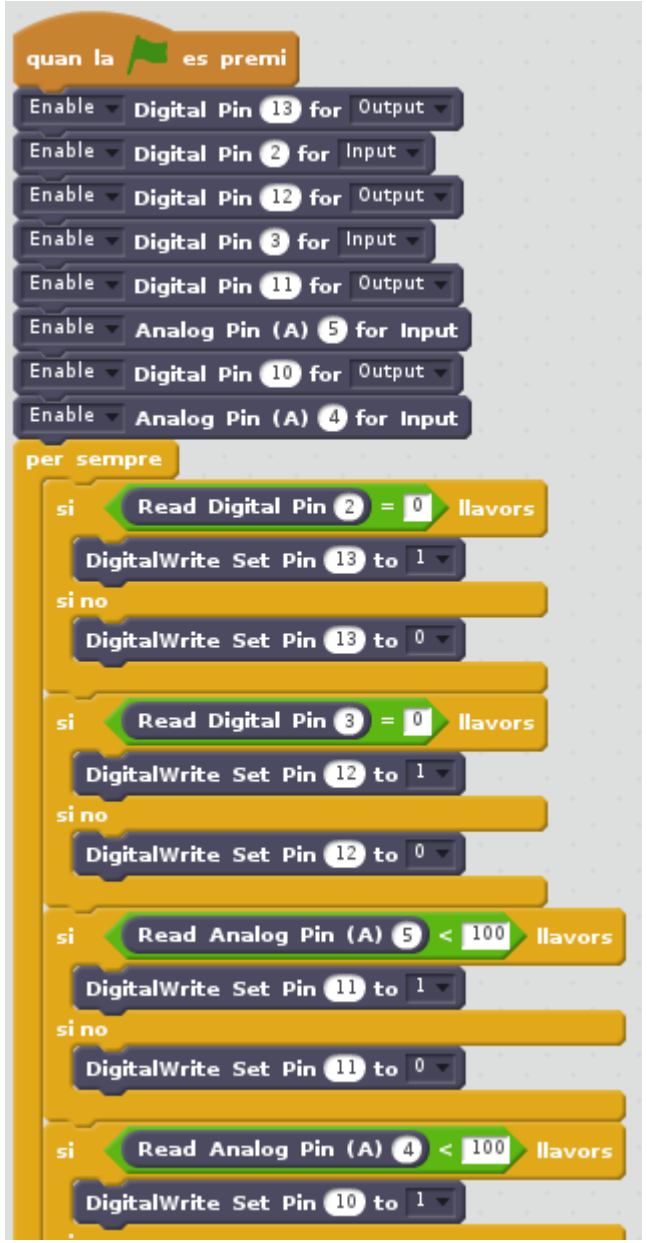




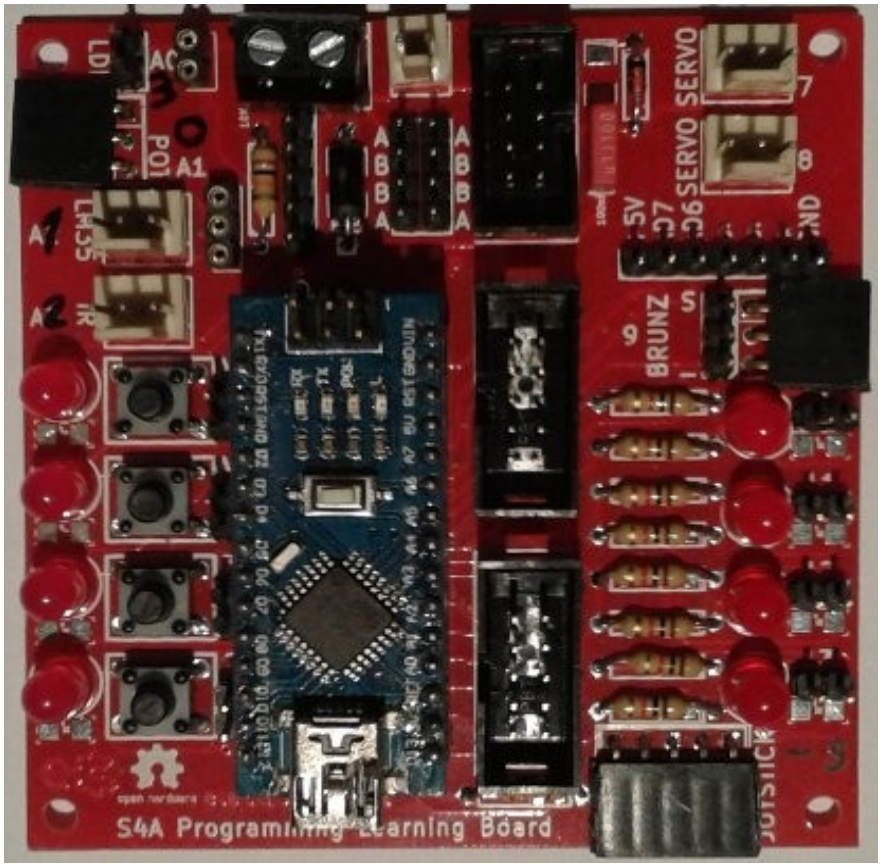
http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor

Hardware Extension (s2a_fm.s2e)



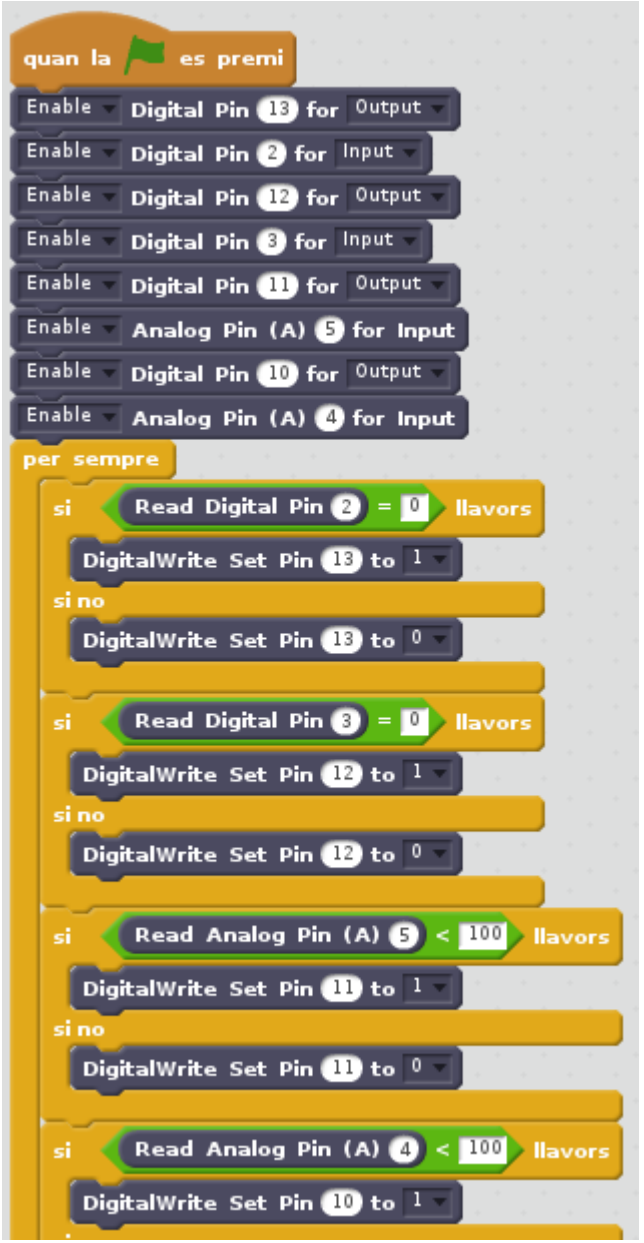
sc2_prova01.sb2



http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor

Hardware Extension (s2a_fm.s2e)



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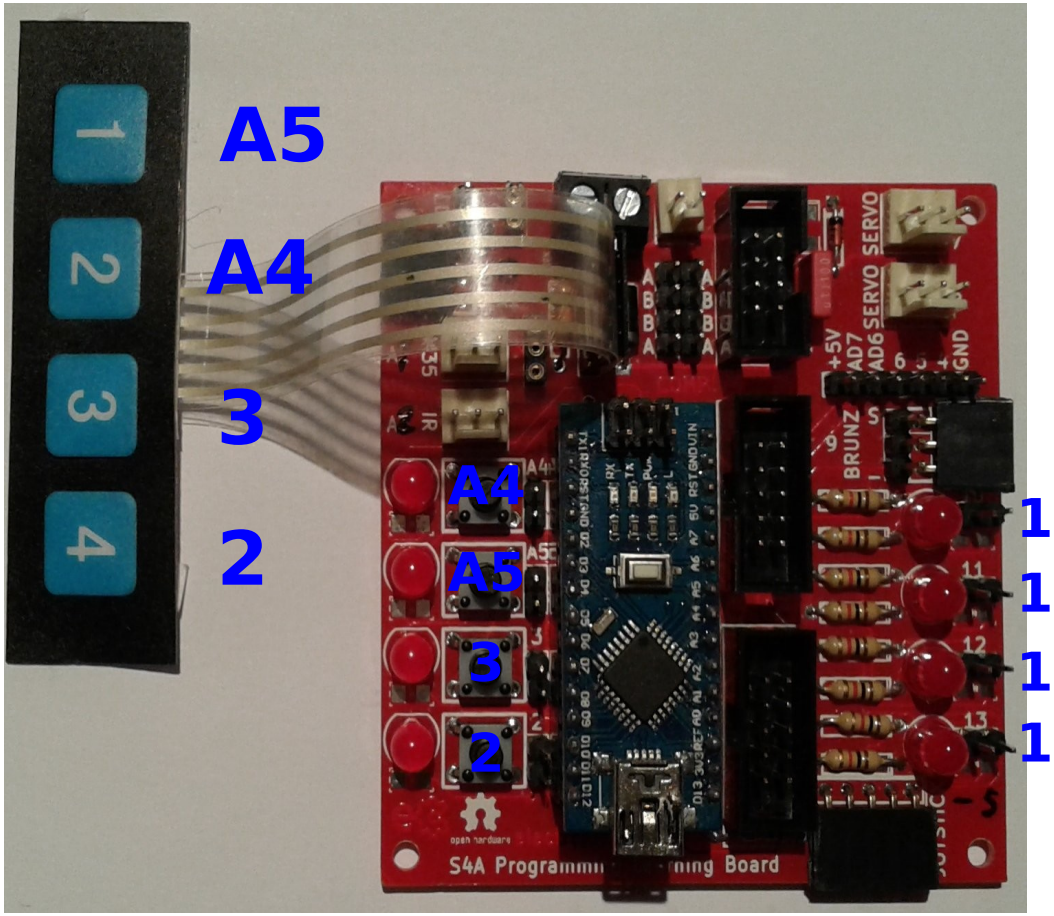
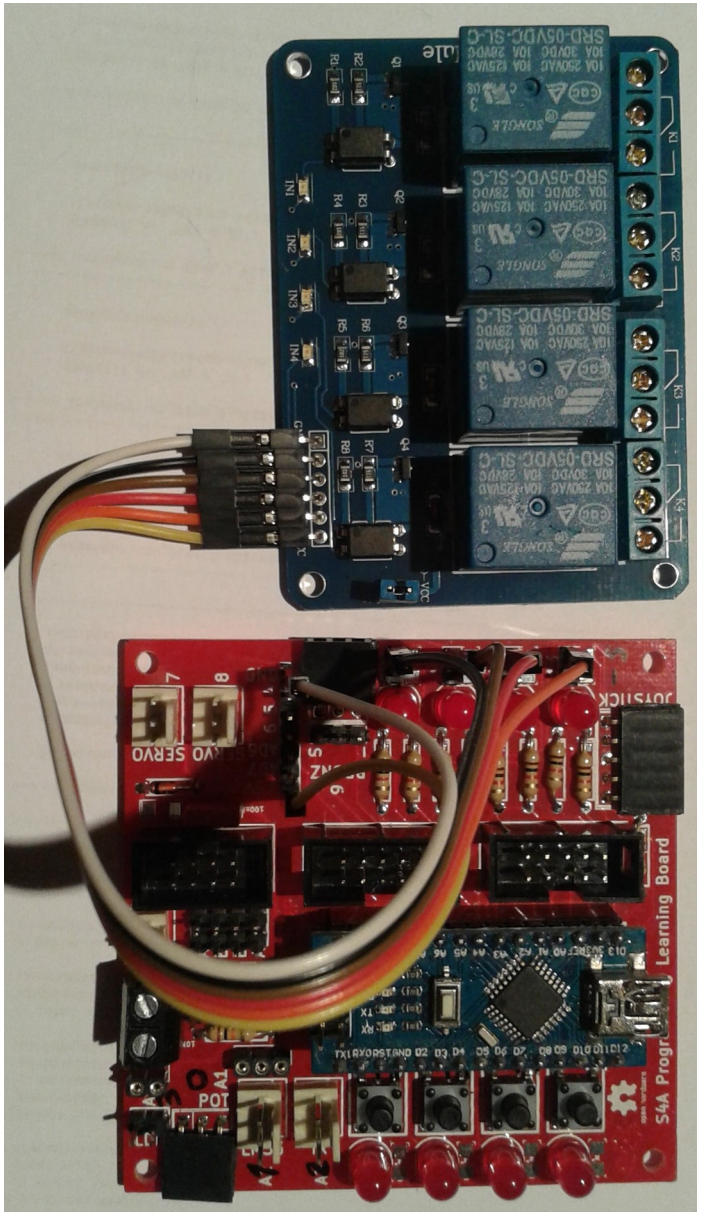


http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor

Hardware Extension (s2a_fm.s2e)



sc2_prova01.sb2

http://binefa.cat/php/training/s4a/codi.tar.gz

electronics.cat

S4A Progamming Learning Board

Concepte de relé

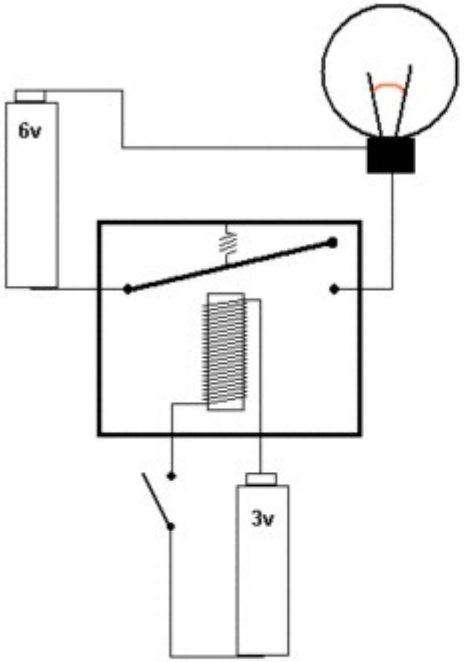


Figure 1: Relay off

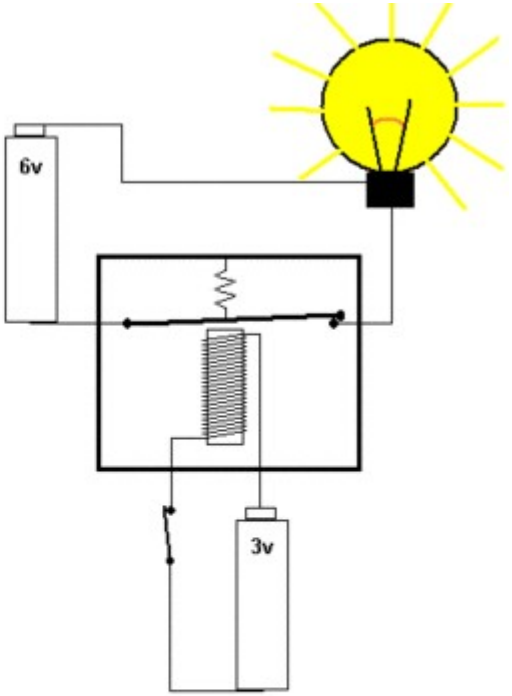
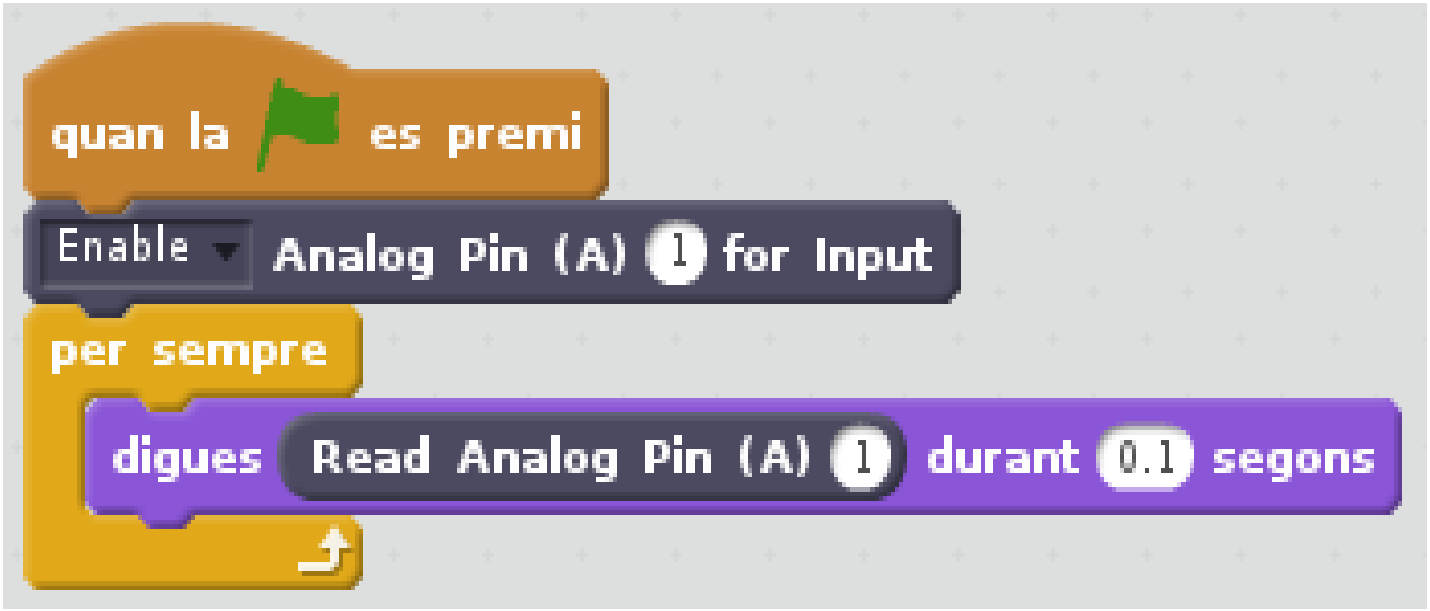


Figure 2: Relay on

Scratch 2 Offline Editor
Hardware Extension (s2a_fm.s2e)

sc2_prova04_potA1.sb2

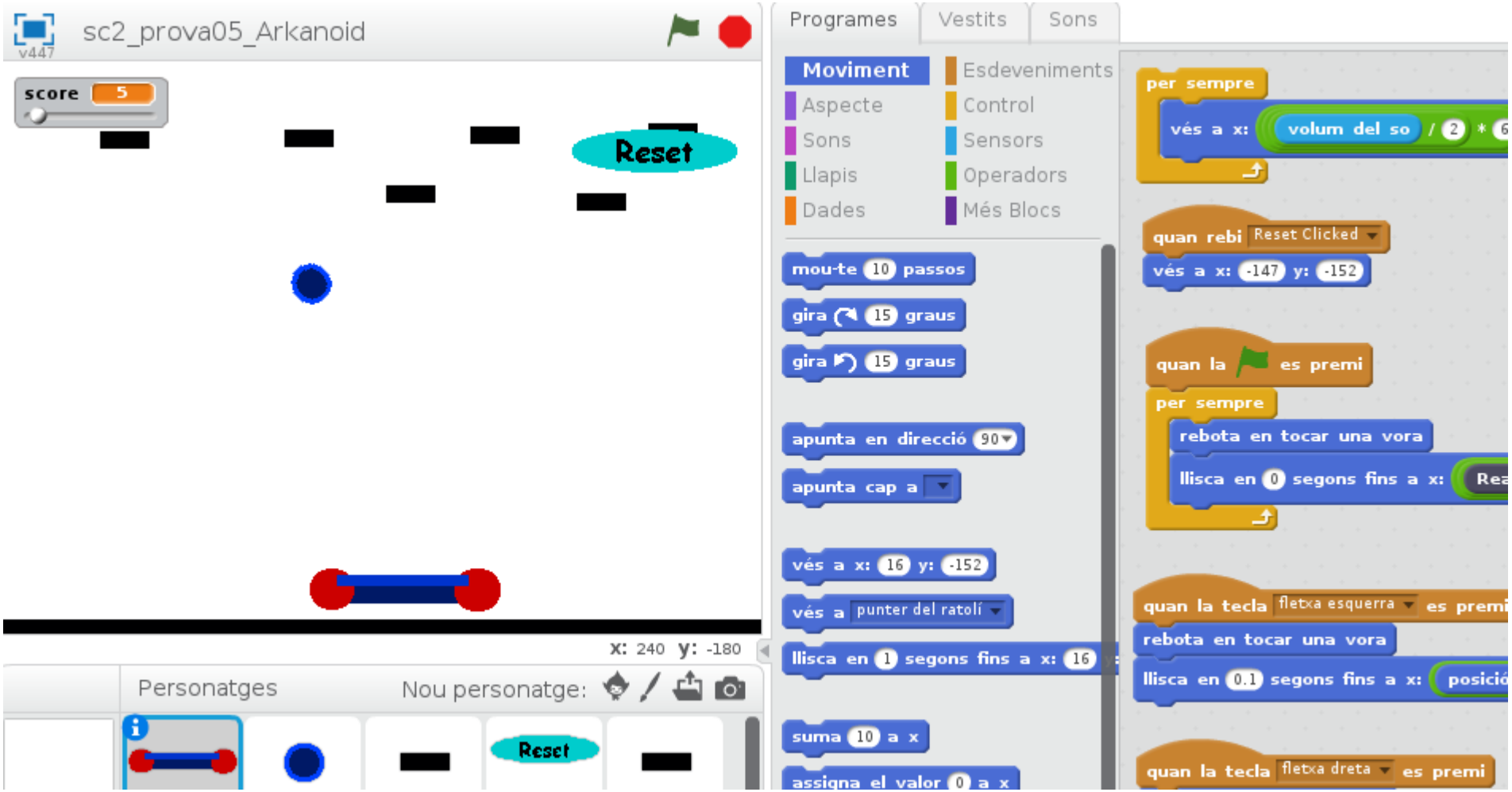


http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor

Hardware Extension (s2a_fm.s2e)

sc2_prova05_Arkanoid.sb2

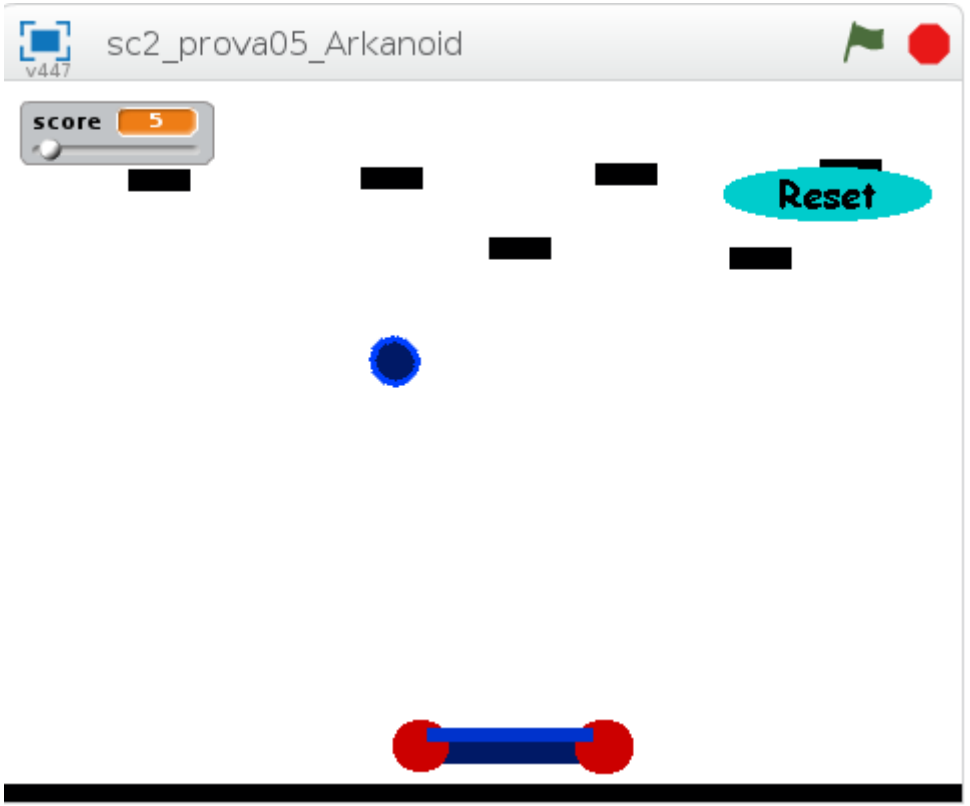


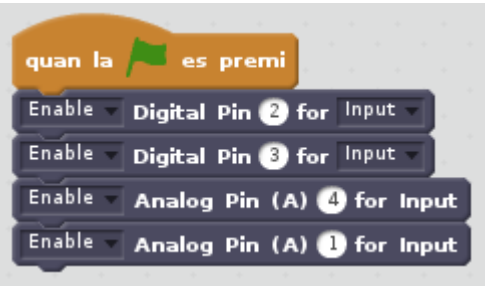
http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor

Hardware Extension (s2a_fm.s2e)

sc2_prova05_Arkanoid.sb2





http://binefa.cat/php/training/s4a/codi.tar.gz

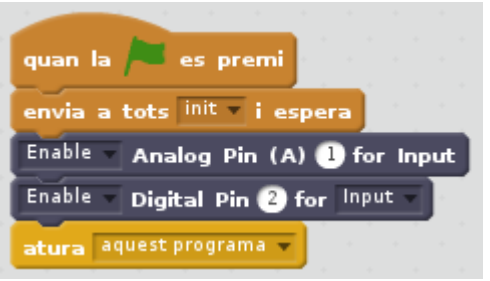
Scratch 2 Offline Editor
Hardware Extension (s2a_fm.s2e)

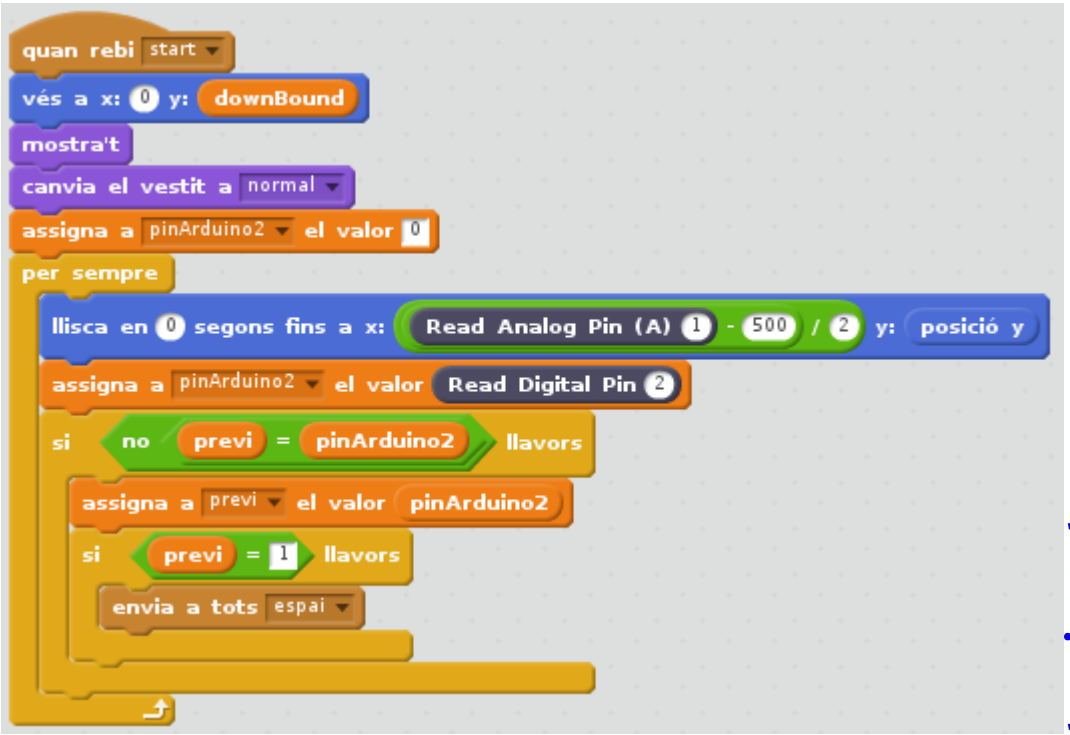
sc2_prova06_ScratchArkanoid.sb2

http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor
Hardware Extension (s2a_fm.s2e)

sc2_prova07_SpaceInvaders1.4.sb2





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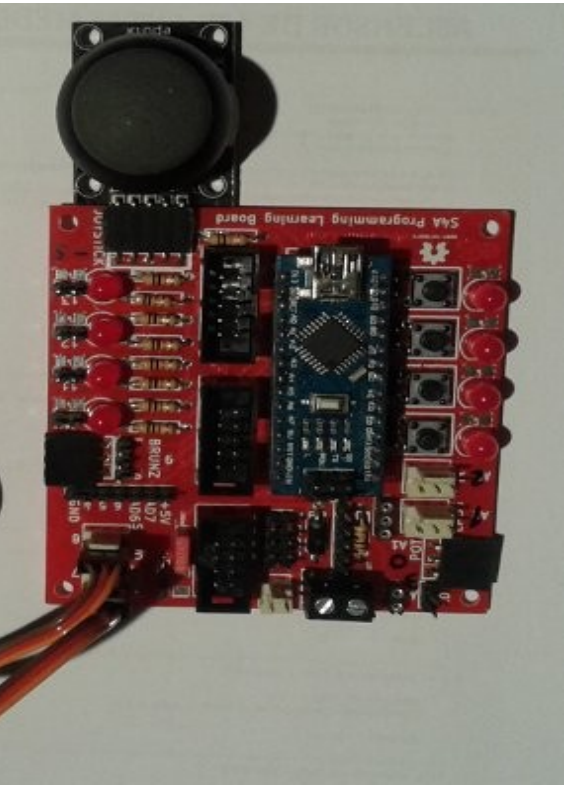
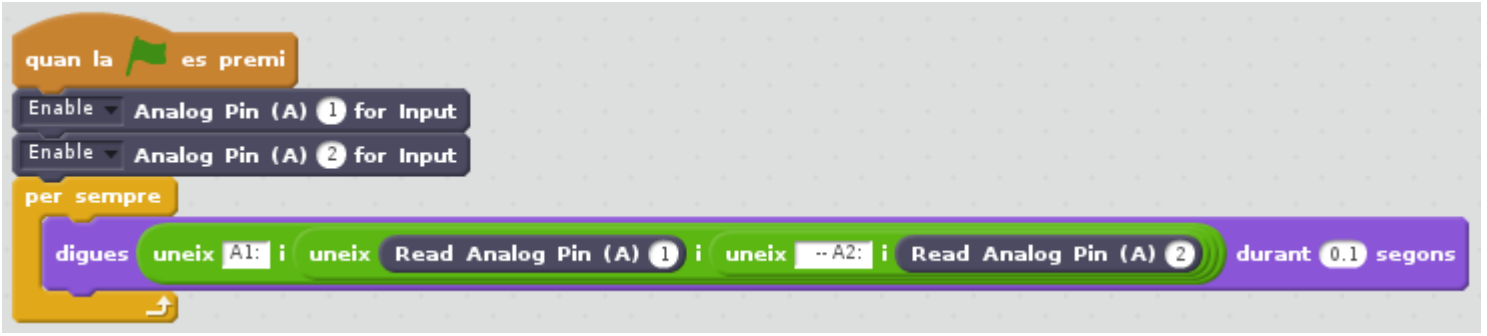
Scratch 2 Offline Editor
Hardware Extension (s2a_fm.s2e)



sc2_prova08_JoystickA1A2.sb2

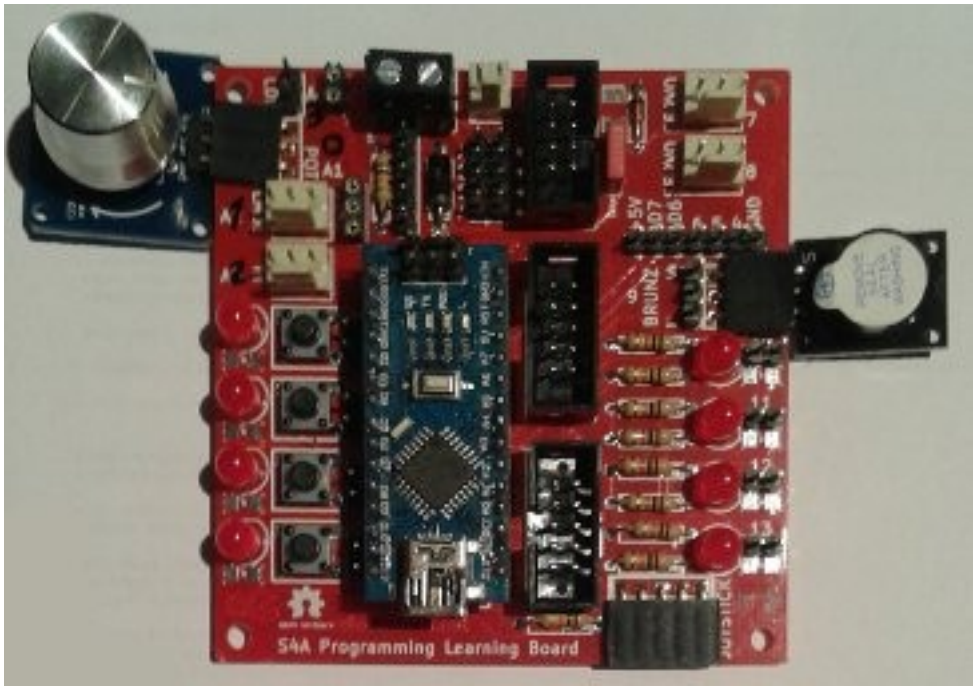


http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor
Hardware Extension (s2a_fm.s2e)

sc2_prova09_potA1brunz.sb2

A1



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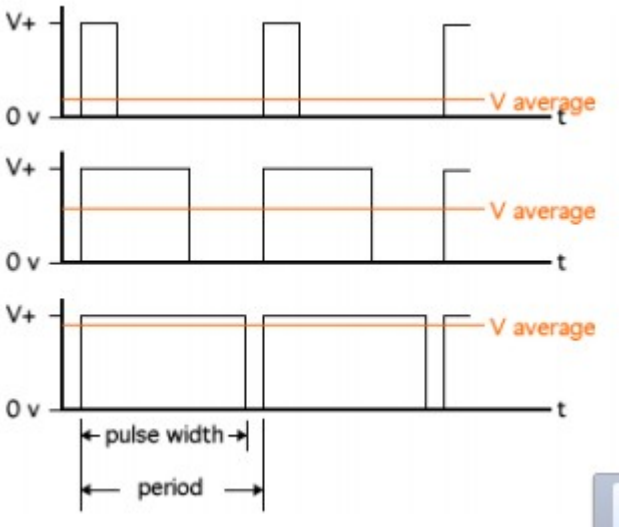
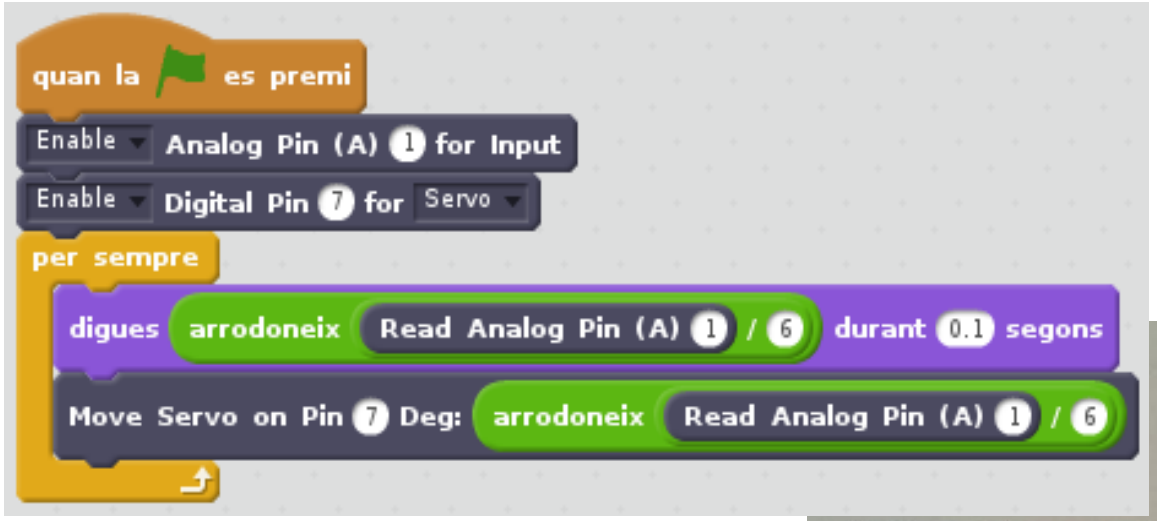


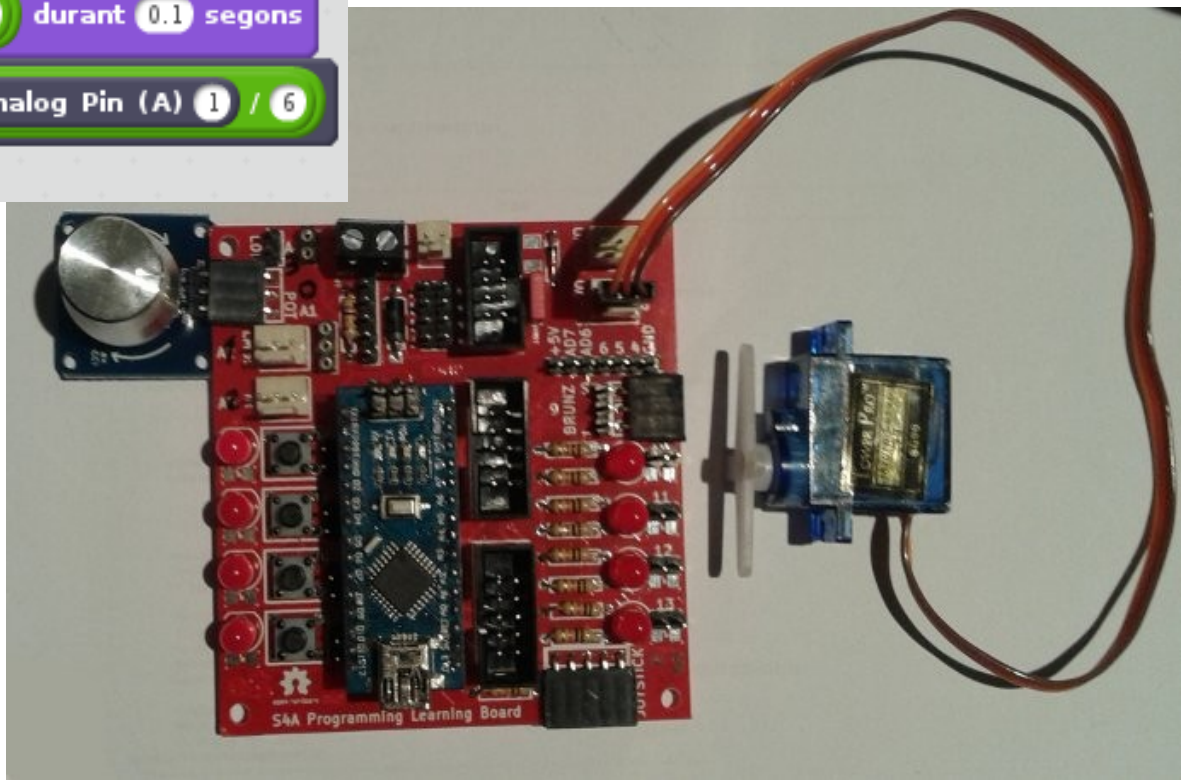
http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor

Hardware Extension (s2a_fm.s2e)

sc2_prova10_potA1_servo7.sb2



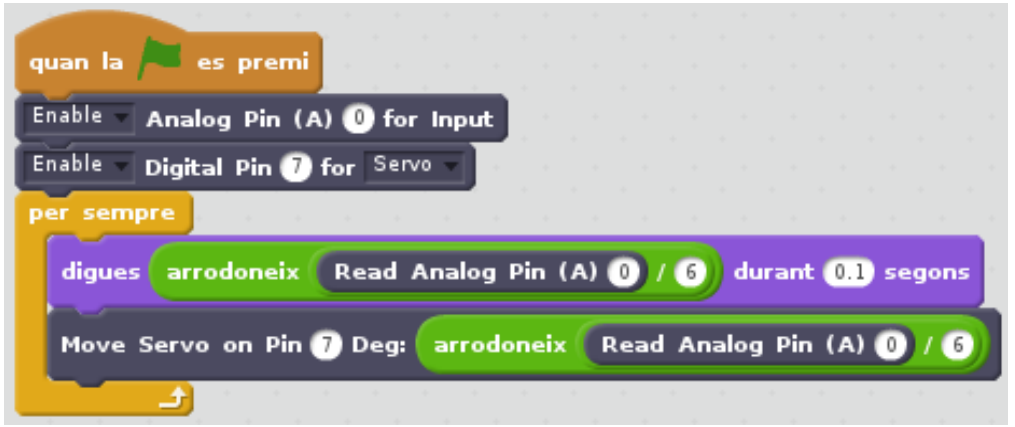


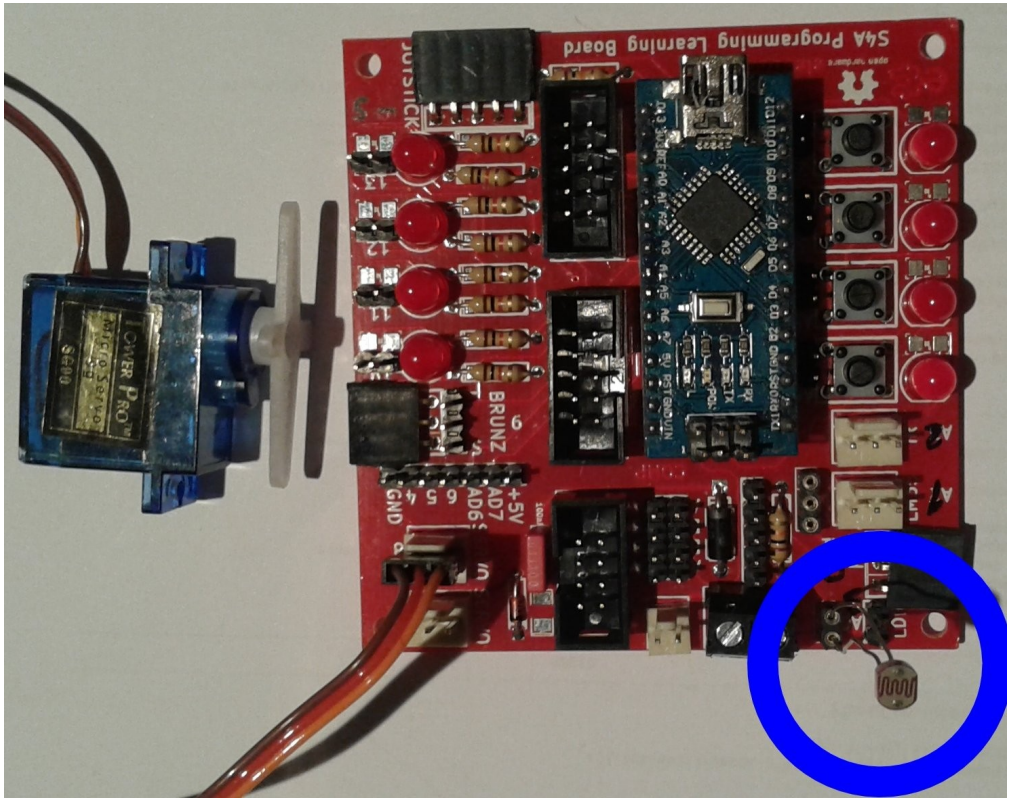
http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor

Hardware Extension (s2a_fm.s2e)

sc2_prova11_ldrA0_servo7.sb2

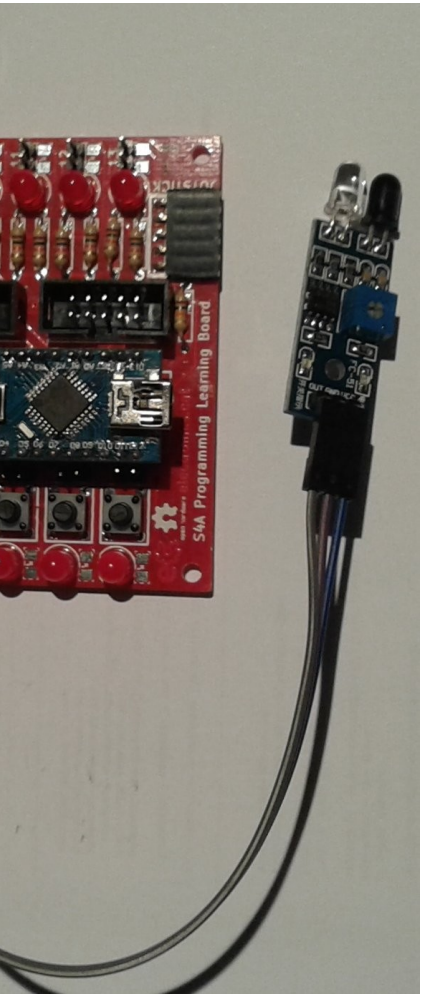




http://binefa.cat/php/training/s4a/codi.tar.gz

Scratch 2 Offline Editor
Hardware Extension (s2a_fm.s2e)

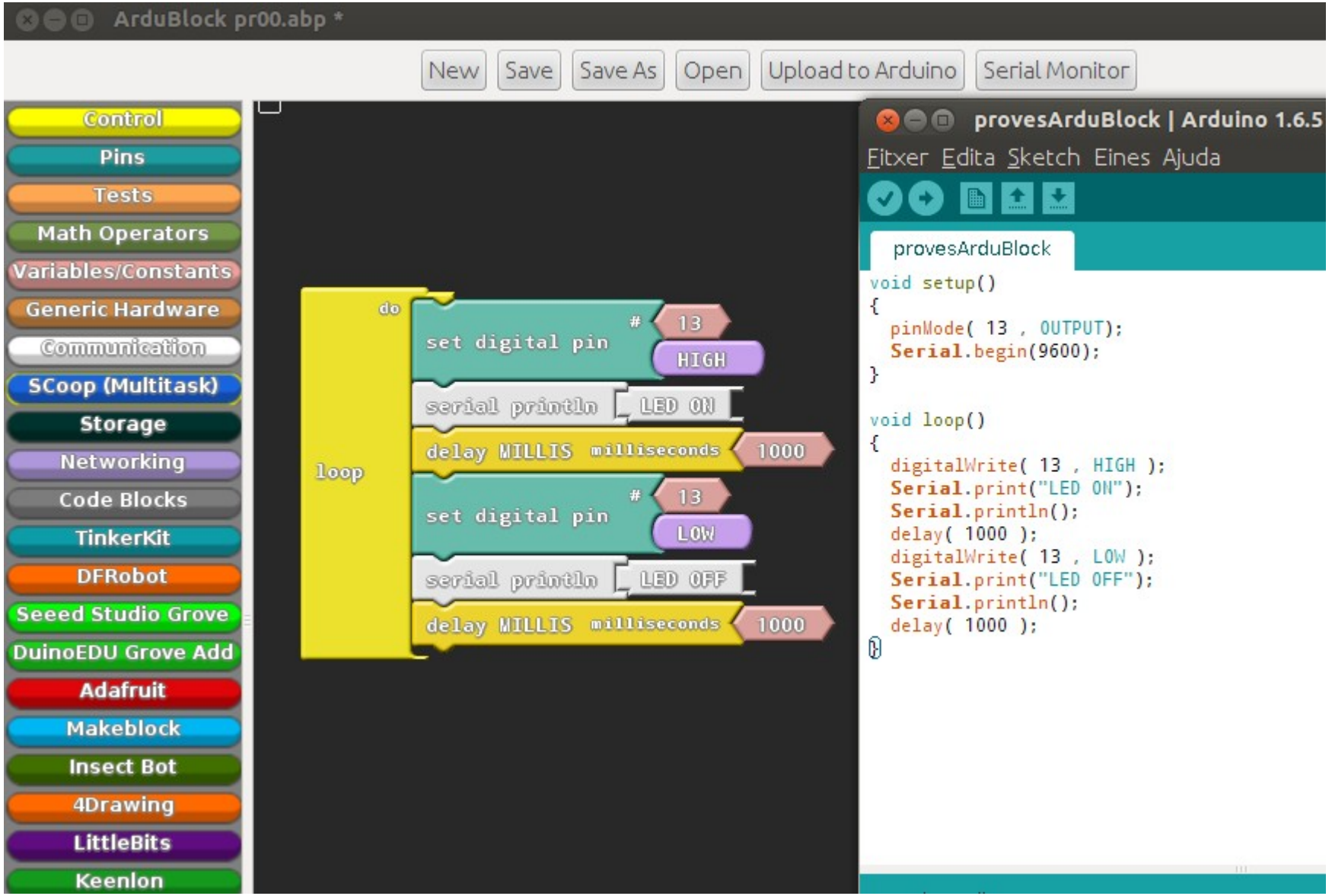
sc2_prova12irRelay.sb2



http://binefa.cat/php/training/s4a/codi.tar.gz

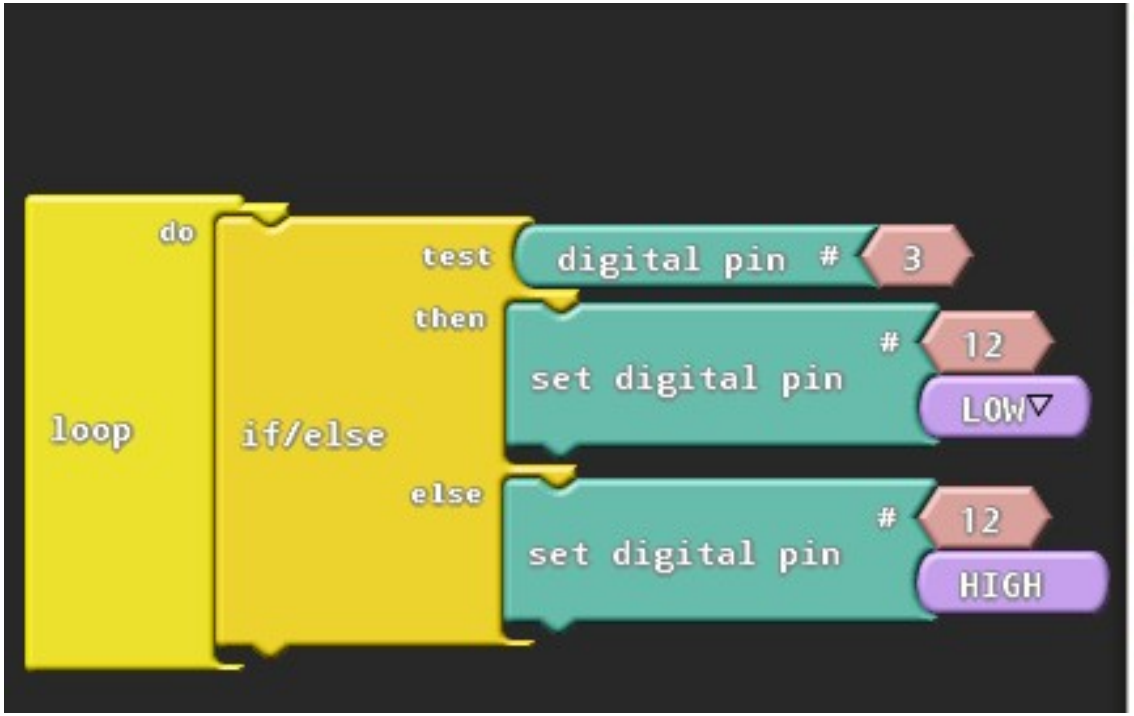
S4A Progamming Learning Board

Ús d'ArduBlock



S4A Progamming Learning Board

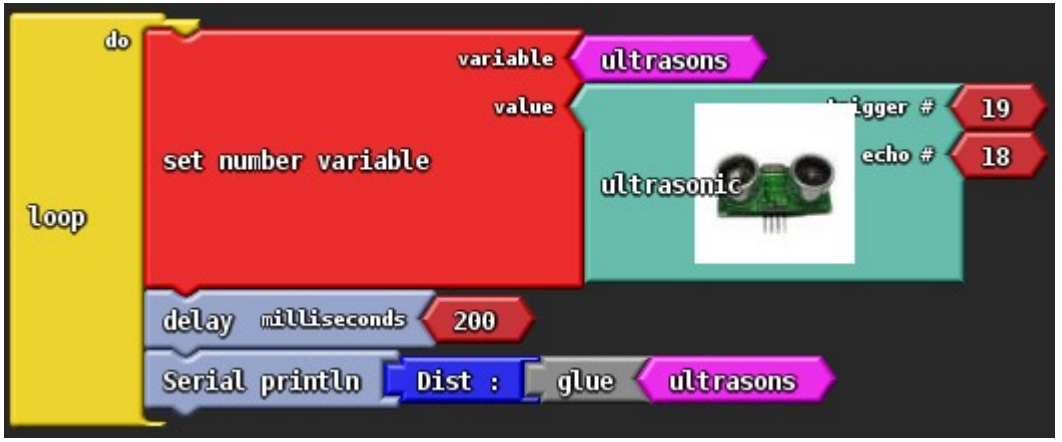
Ús d'ArduBlock

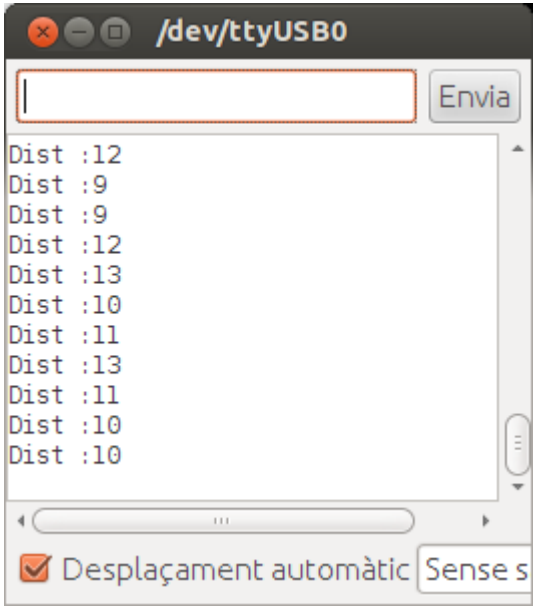


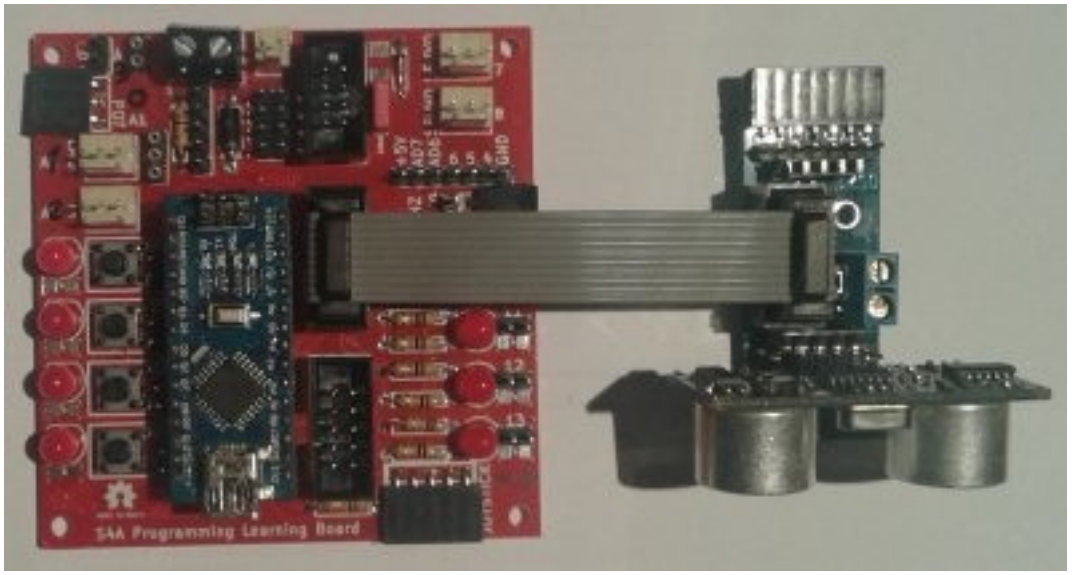

```
void setup()
{
  pinMode( 3 , INPUT);
  pinMode( 12 , OUTPUT);
}

void loop()
{
  if (digitalRead(3))
  {
    digitalWrite( 12 , LOW );
  }
  else
  {
    digitalWrite( 12 , HIGH );
  }
}
```

S4A Progamming Learning Board

Ús d'ArduBlock





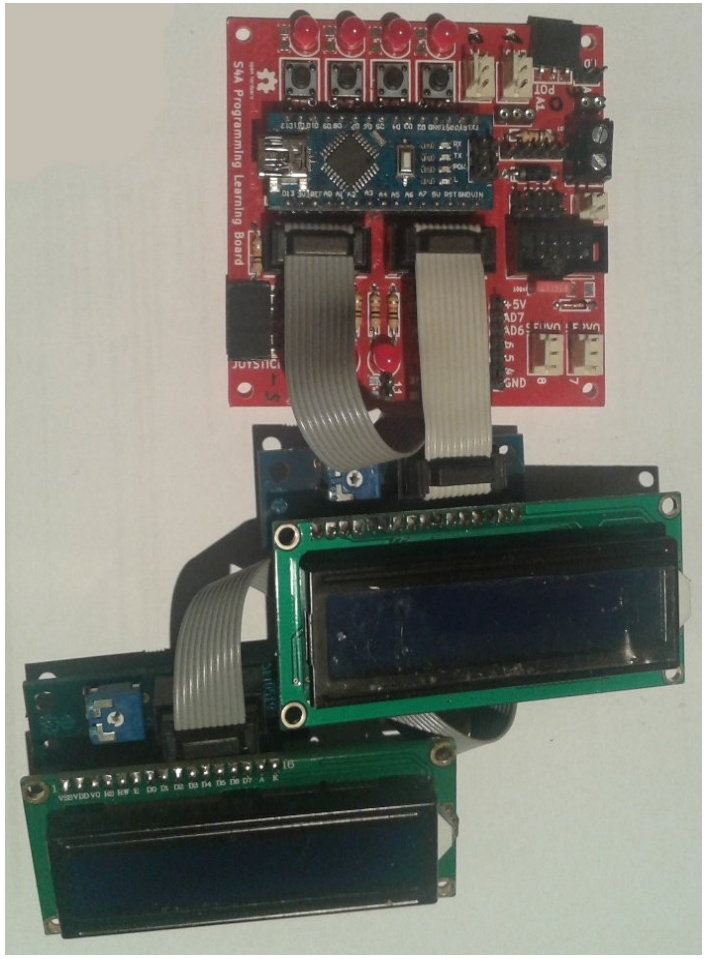


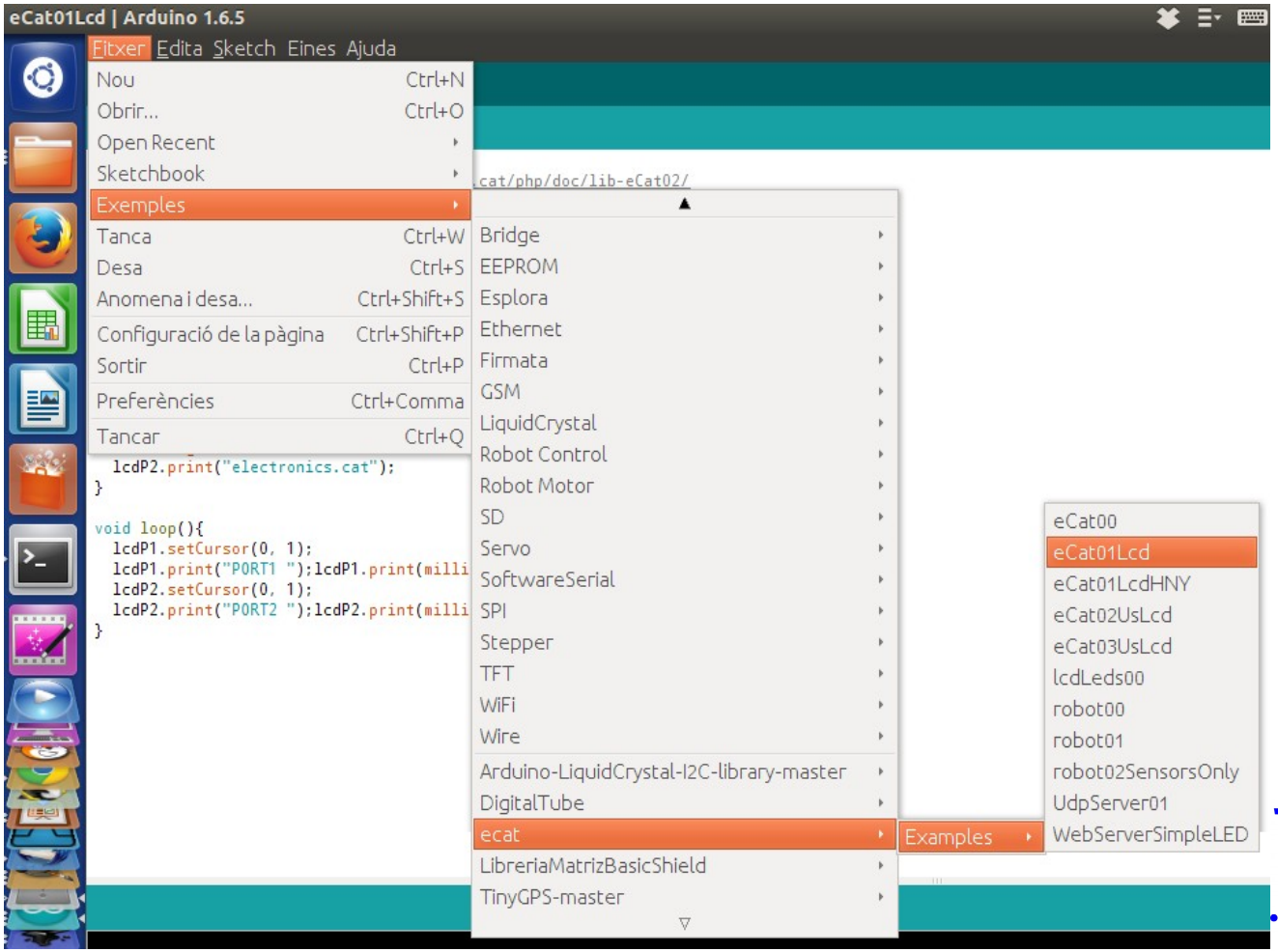
http://www.binefa.cat/php/arduino/ardublock/pr05ultrasons.abp

http://www.binefa.cat/php/doc/pr002/

S4A Progamming Learning Board

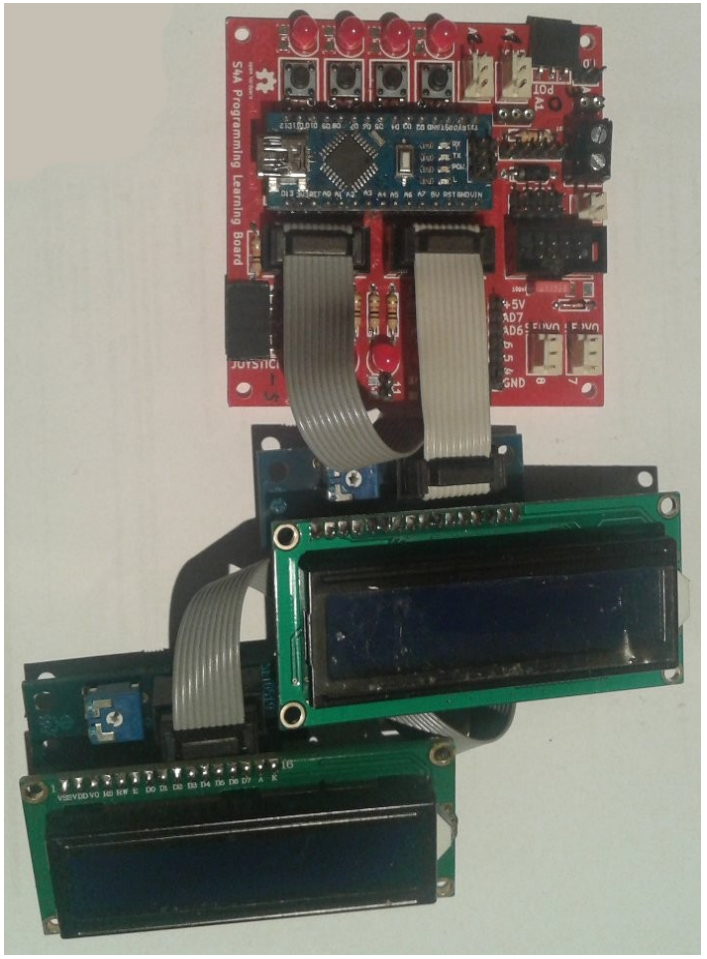
Ús de la biblioteca ecat.h





S4A Progamming Learning Board

Ús de la biblioteca ecat.h



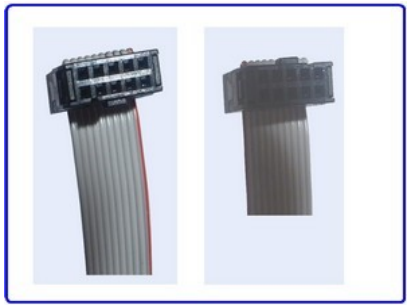

```
/*
Connection schematic at http://www.binefa.cat/php/doc/lib-eCat02/
*/

#include <ecat.h>
#include <LiquidCrystal.h>

Ecat ecat;
lcdP1_init();
lcdP2_init();

void setup(){
  lcdP1.begin(16, 2);
  lcdP1.print("ecat.h - v");lcdP1.print(ecat.fVersion());
  lcdP2.begin(16, 2);
  lcdP2.print("electronics.cat");
}

void loop(){
  lcdP1.setCursor(0, 1);
  lcdP1.print("PORT1 ");lcdP1.print(millis()/1000);lcdP1.print(" seconds");
  lcdP2.setCursor(0, 1);
  lcdP2.print("PORT2 ");lcdP2.print(millis()/1000);lcdP2.print(" seconds");
}
```

S4A Progamming Learning Board

BUS : Sistema digital que transfereix dades entre dispositius electrònics

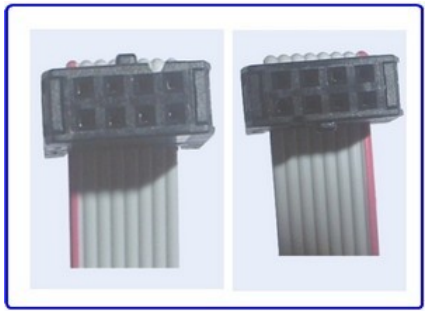
GND	b7
b6	b5
b4	b3
b2	b1
b0	+5V

Cable pla 5x2 a 5x2 (0104A)



	+5V o	CTS / RTS
CTS / RTS	o X	
TX / RX	o X	
RX / TX	o GND	

Cable pla 4x2 a 4x2 (0311)



eCat System : Dues tipologies de BUS, dades (8 bits) i comunicacions

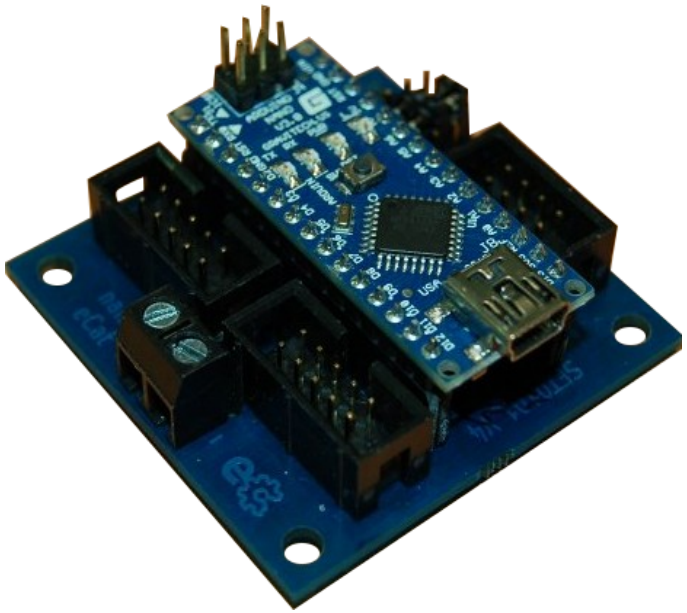
http://electronics.cat/php/common/index.php?lang=ca&page=044

S4A Progamming Learning Board

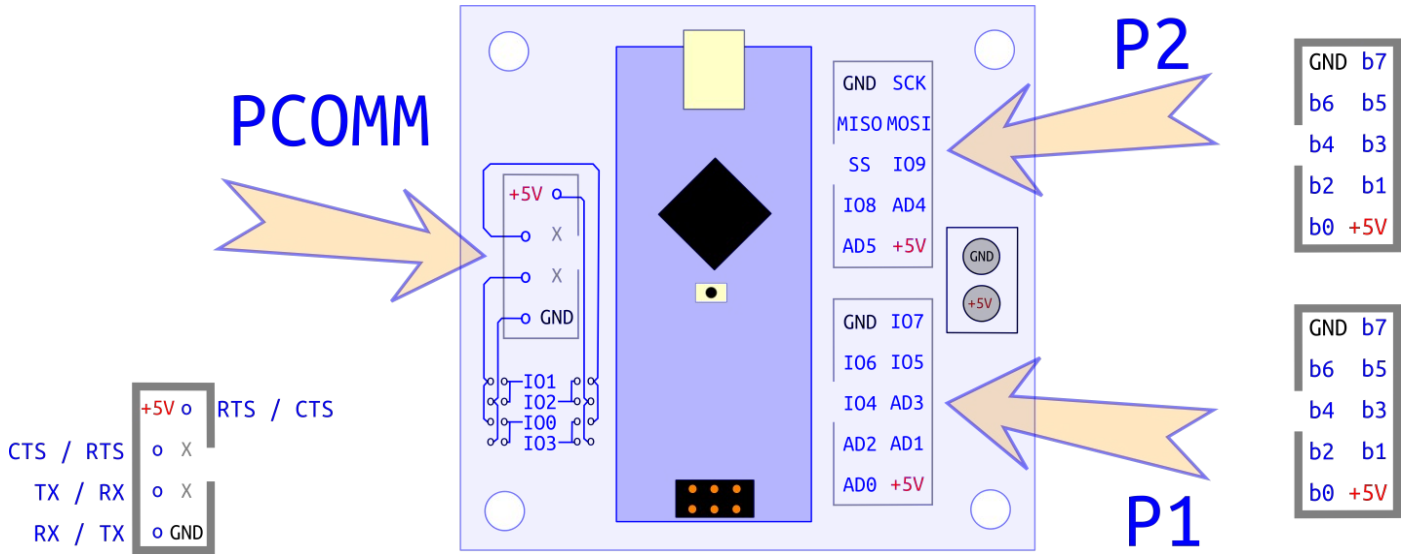
Plaques amb sistema de bus lliure eCat

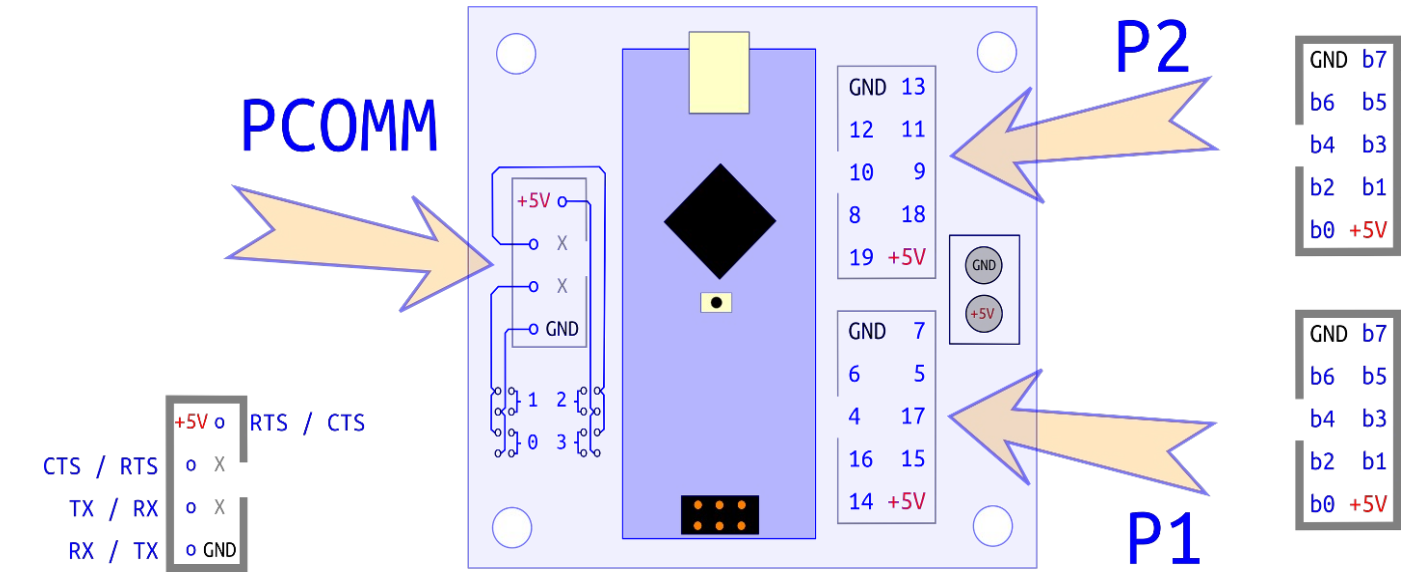
nano-eCat

Placa 0101 v4



Placa convertidora de l'Arduino Nano al sistema de bus lliure eCat System

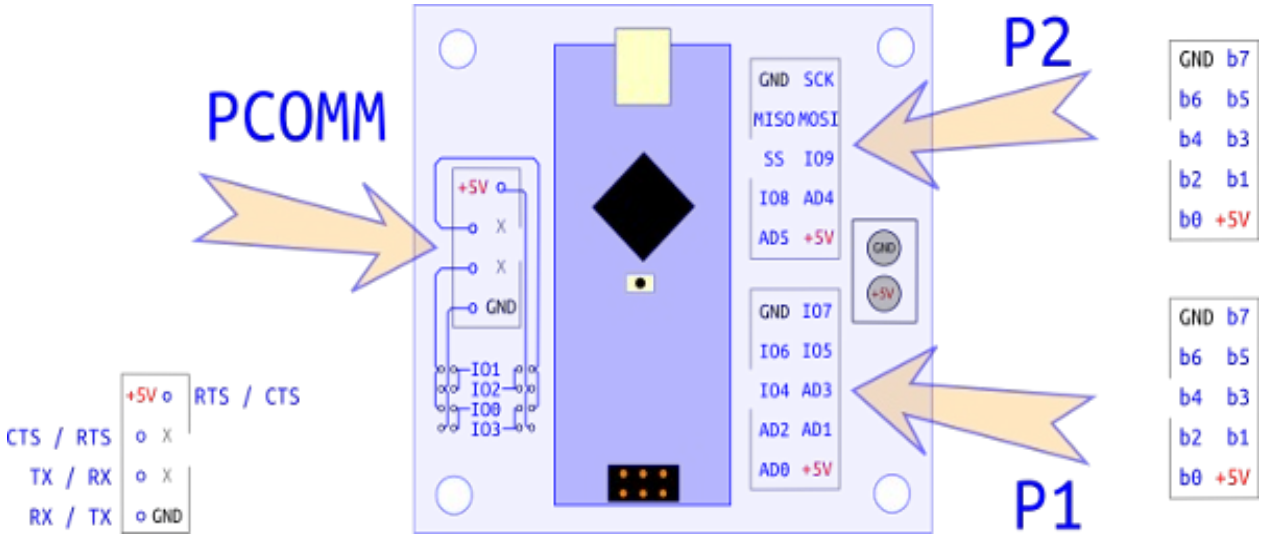


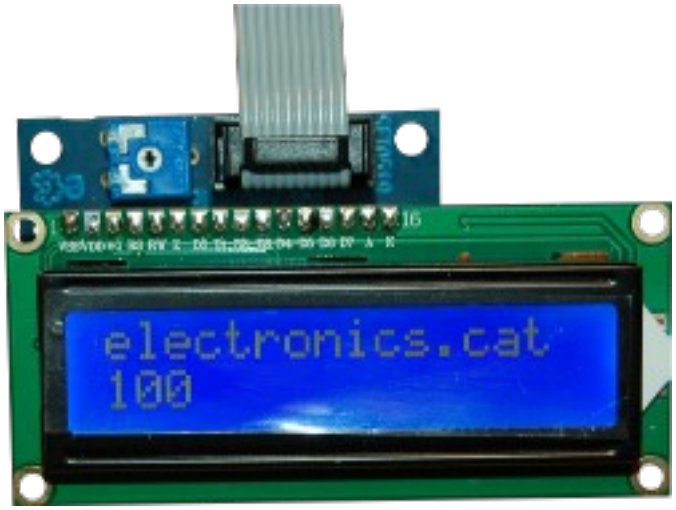


S4A Progamming Learning Board

LCD

Afegiu el mòdul de l'LCD a P1 de la nano-eCat :





http://www.binefa.cat/php/arduino/serialWrRd04LcdP1.zip

S4A Progamming Learning Board

Instal·lació de l'Scratch for Arduino (S4A)

Paquet de l'S4A per a Debian / Ubuntu

Es pot instal·lar fent servir el gestor de paquets per defecte o escrivint al terminal :

```
sudo dpkg -i S4A16.deb
```

S4A Progamming Learning Board

Instal·lació d'ArduBlock

Des del navegador web descarregueu-vos **ardublock-beta-20140828** :

http://sourceforge.net/projects/ardublock/files/ardublock-beta-20140828.jar/download

A les versions de l'IDE d'Arduino prèvies a la versió 1.6.1 :

Copieu **ardublock-beta-20140828.jar** a : ~/sketchbook/tools/ArduBlockTool/tool

A la versió de l'IDE d'Arduino 1.6.1 o superior :

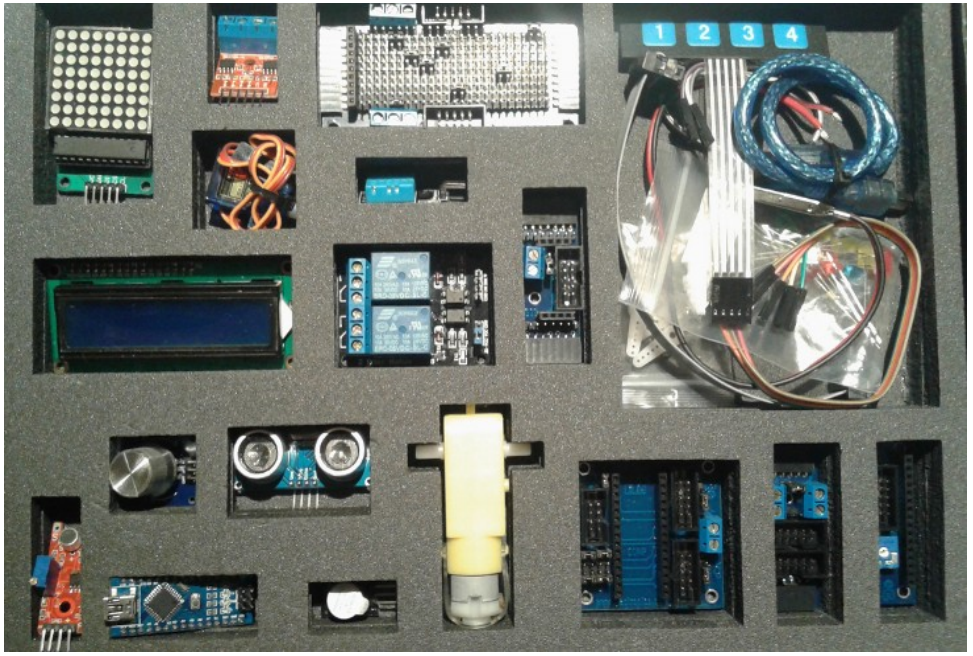
Copieu **ardublock-beta-20140828.jar** a : ~/Arduino/tools/ArduBlockTool/tool

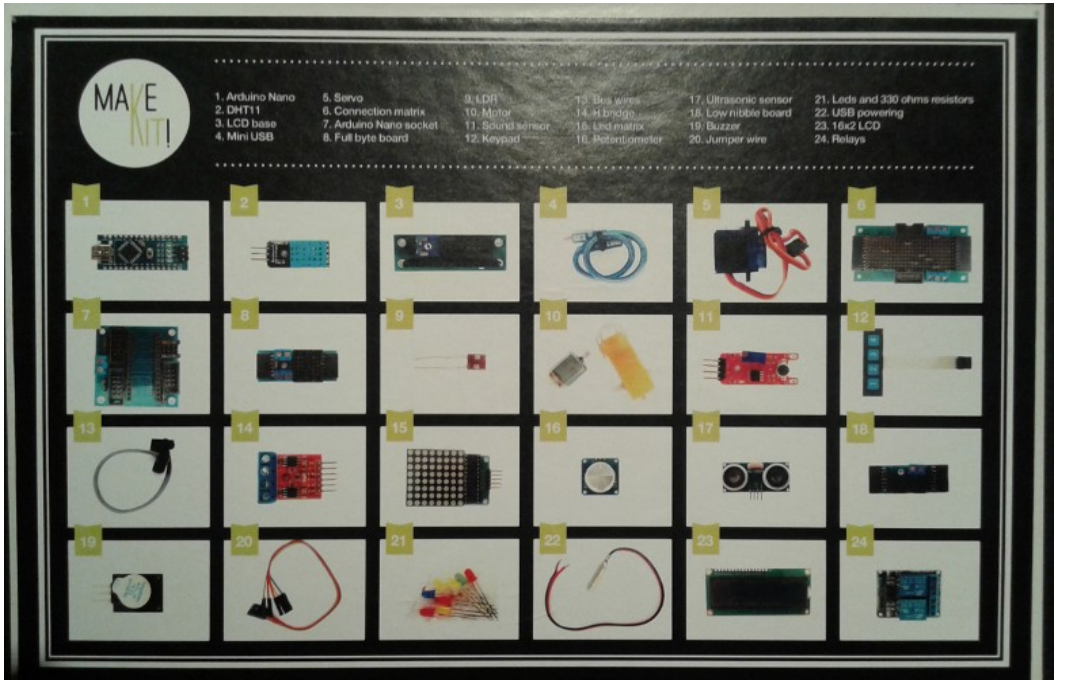
Altre maquinari lliure

Make It!

Altre maquinari lliure

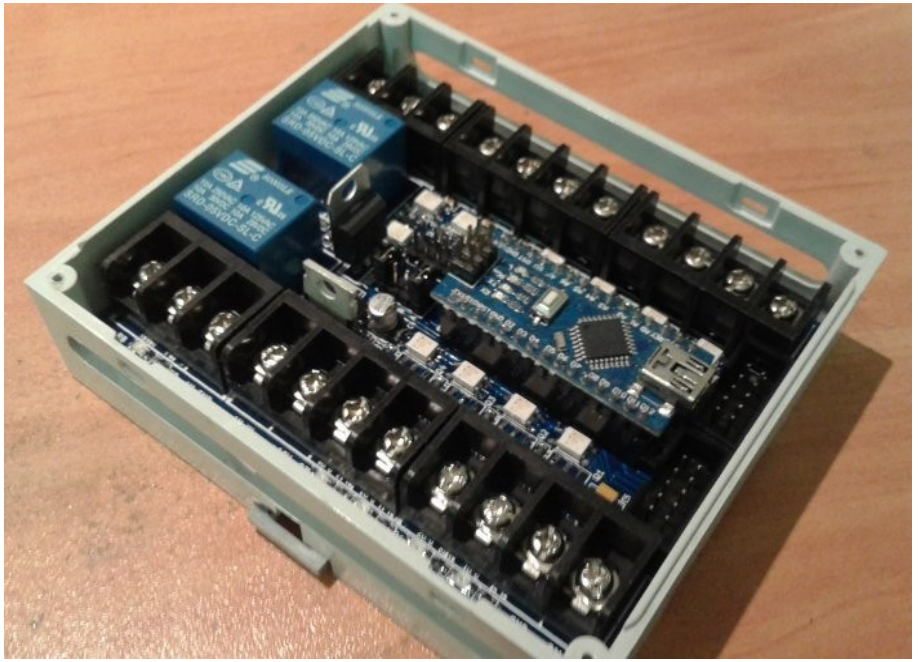
Make It!

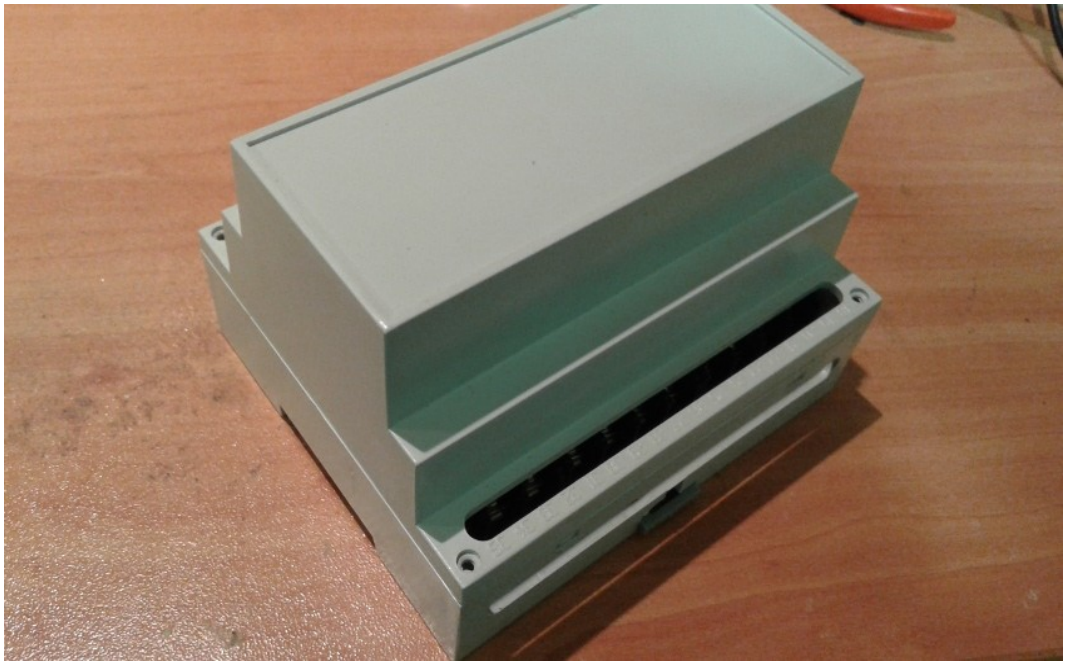




Altre maquinari lliure

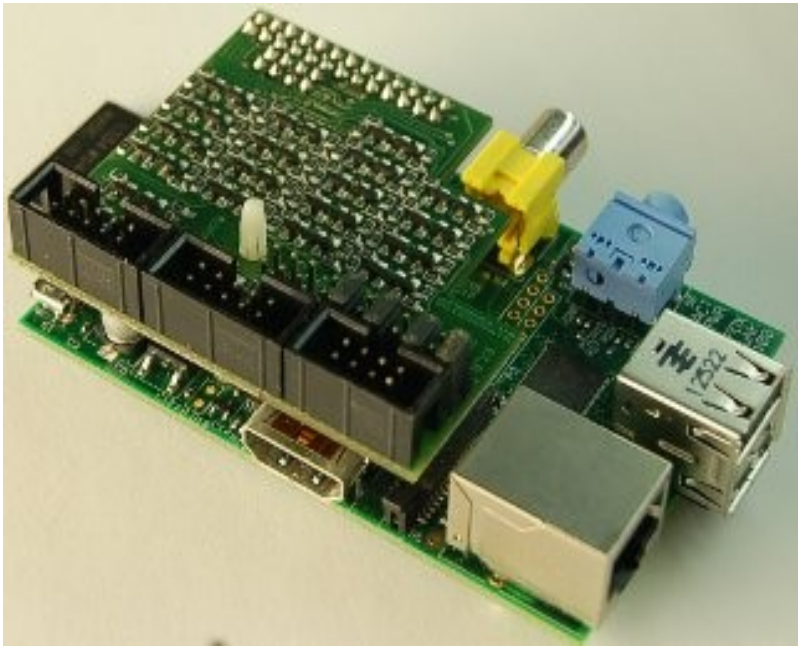
petitPLC

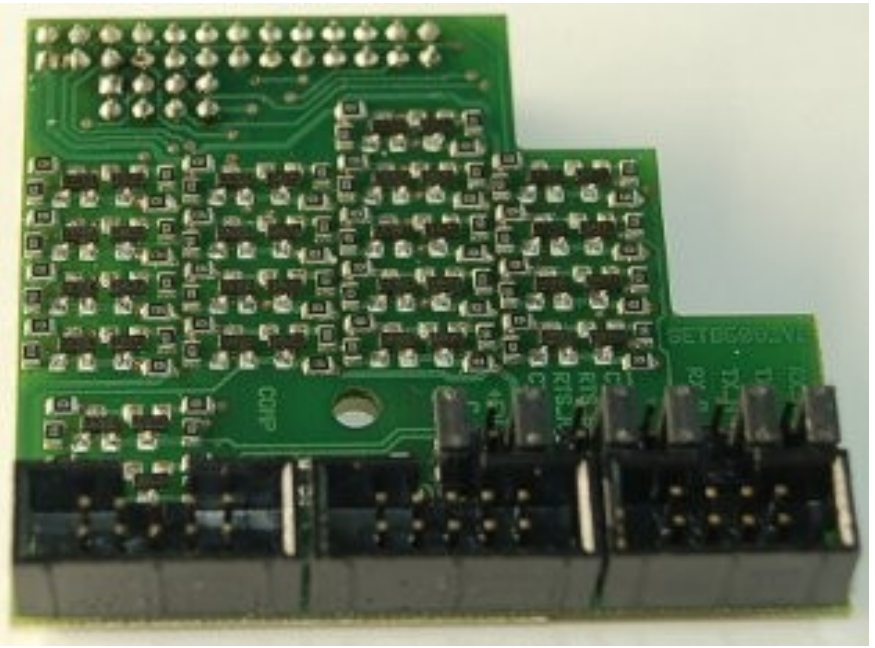




Altre maquinari lliure

3Bpi - Pi de les Tres Branques
Placa traductora de nivells per a Raspberry Pi
Placa set05_08_v2





http://electronics.cat/php/common/index.php?lang=ca&page=508

Torn de preguntes ...

... i sessió pràctica.

COMIAT

Presentació descarregable a :

http://binefa.cat/blog/?p=330

Correu electrònic de contacte : **jordibinefa@electronics.cat**

https://twitter.com/electronicscat
https://twitter.com/JordiBinefa

http://makeit.cat/

http://es.linkedin.com/pub/jordi-binefa/13/717/90b

Kits disponibles a la botiga: NUFESA ELECTRONICS

Comandes de plaques S4A PLB : oshwt@electronics.cat

Moltes gràcies per la vostra assistència

http://www.electronics.cat / http://makeit.cat/