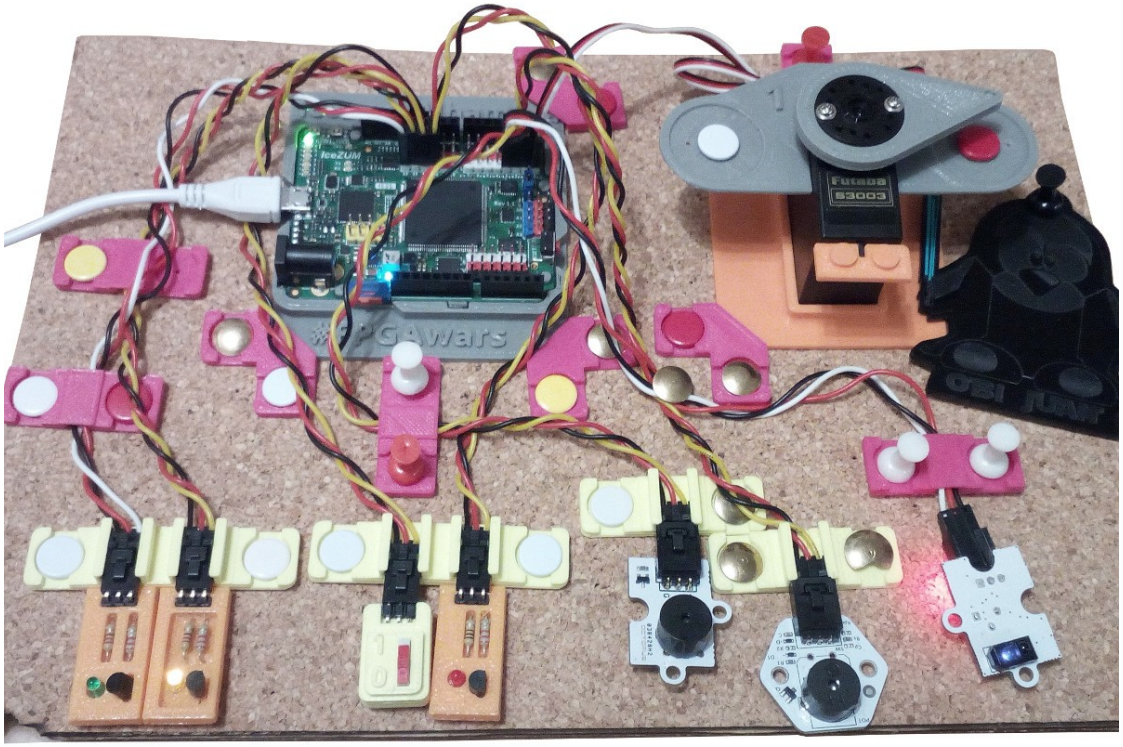
Electrónica digital divertida con FPGAs Libres



Juan González Gómez (Obijuan)

https://github.com/Obijuan

27 de Abril de 2017,
I.E.S Politécnico Jesús Marín
MÁLAGA

https://github.com/Obijuan/myslides

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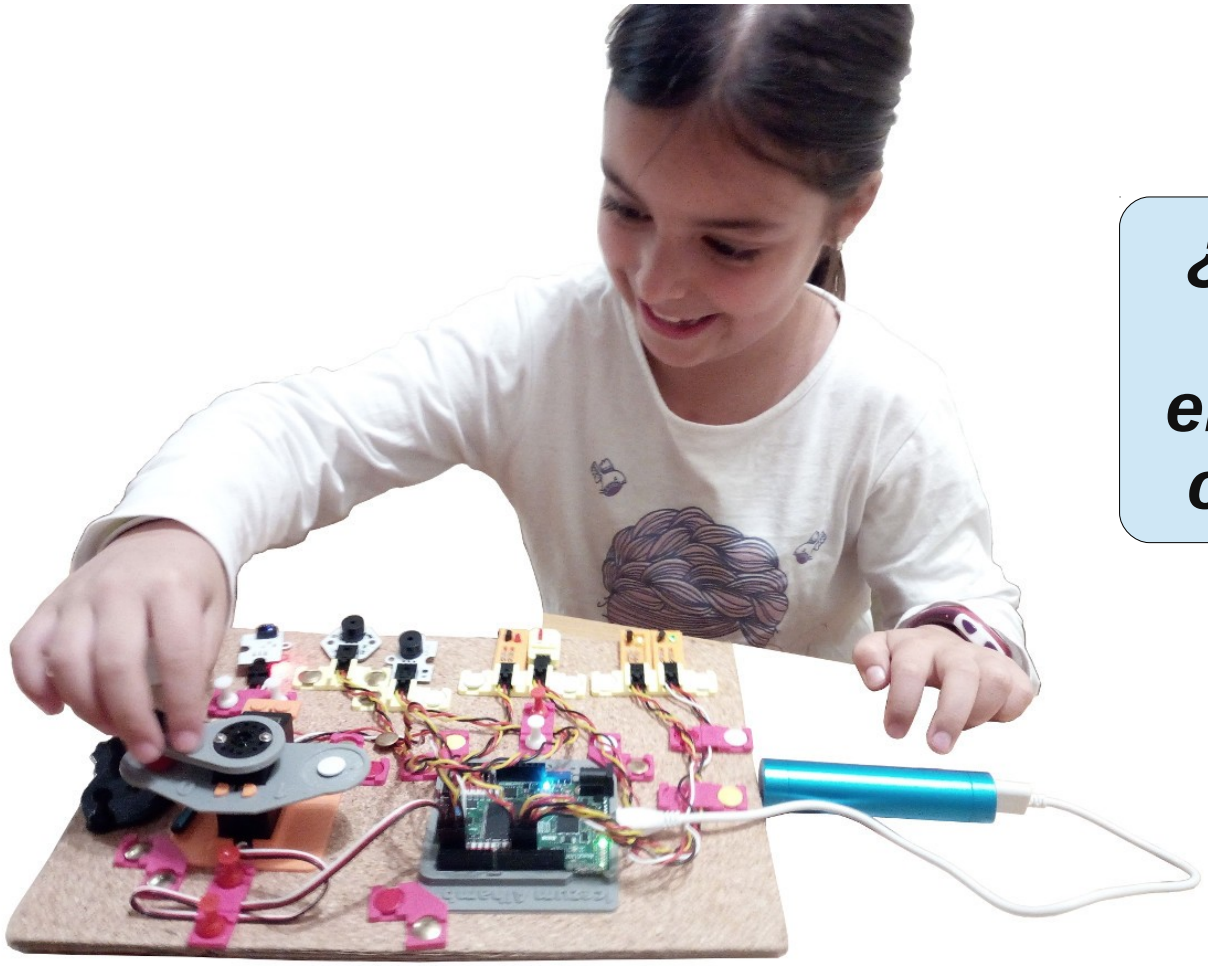
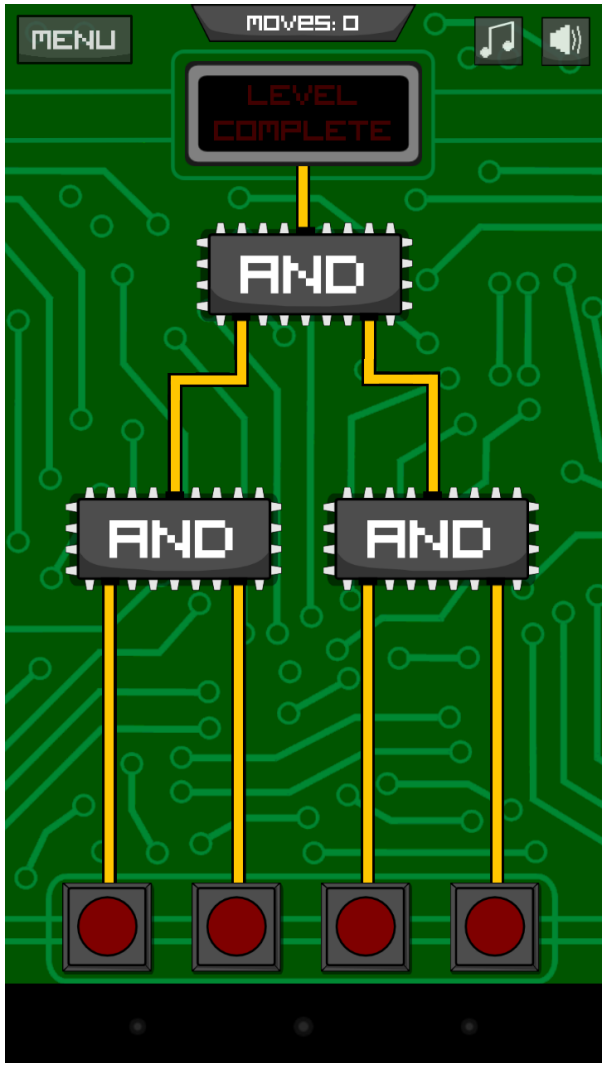
Motivación

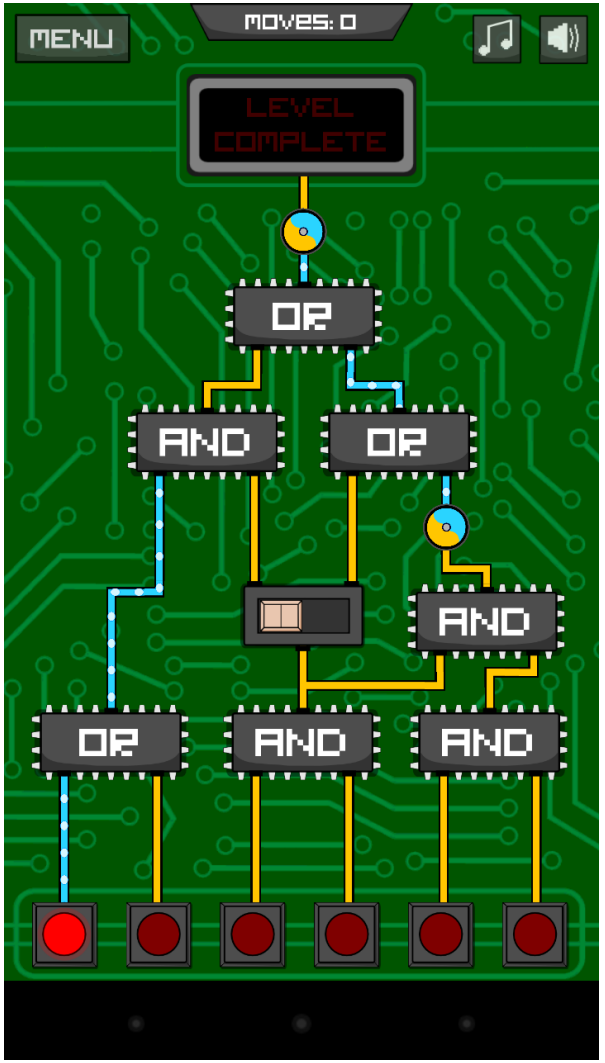
Electrónica digital accesible



¿Cómo podrían los niños y los no electrónicos diseñar circuitos digitales?



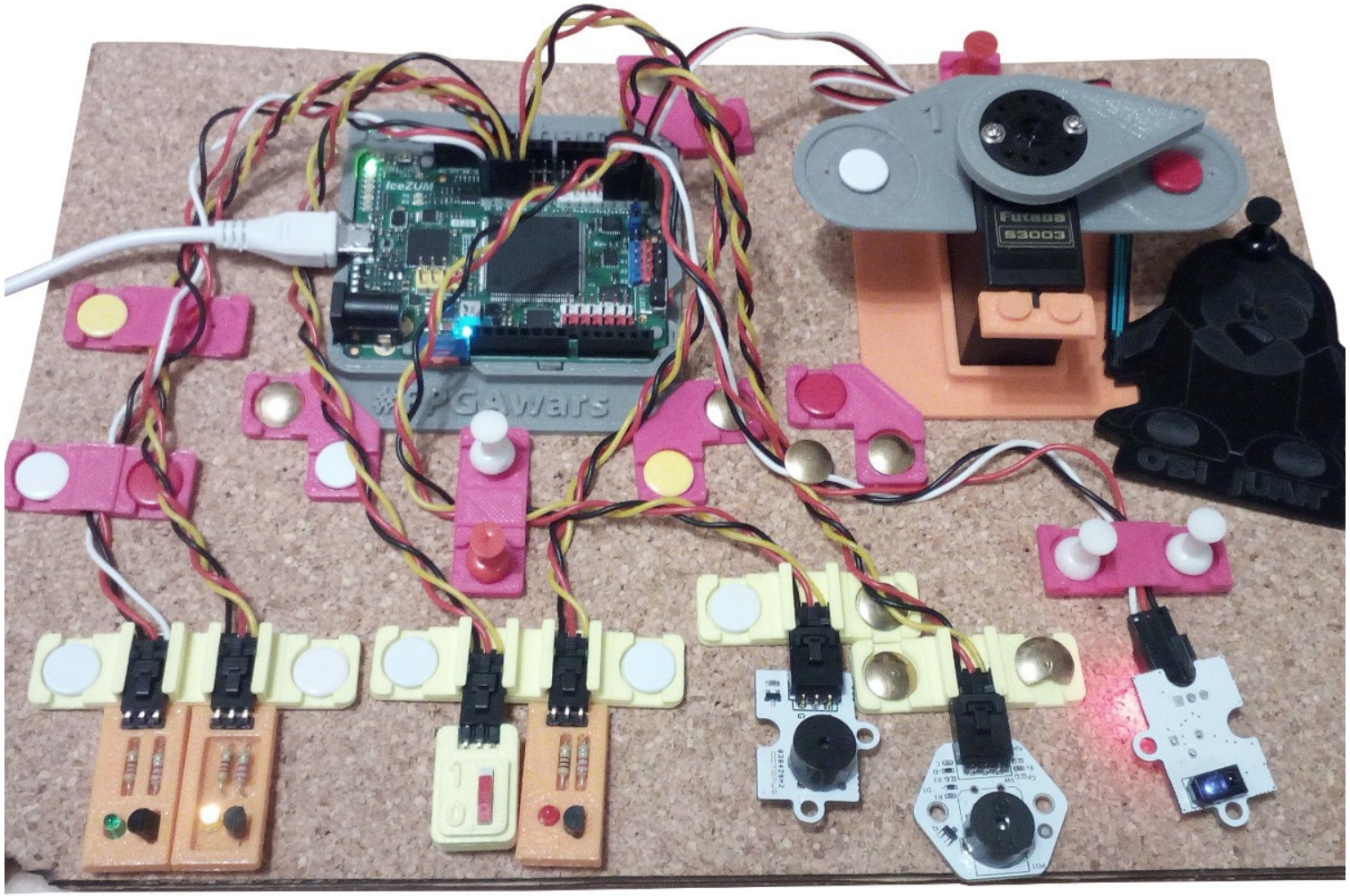
APP:
Circuit Scramble



La electrónica digital es intuitiva y… ¡Divertida!

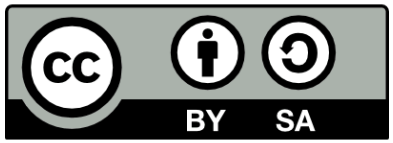
Contenido

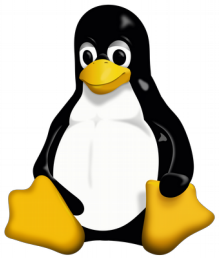
Demo/Tutorial:
Sistema de alarma por proximidad

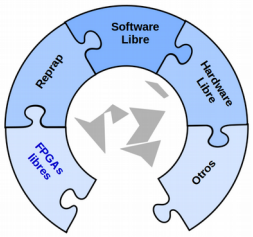


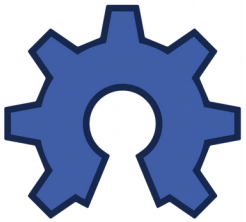
You’re leaving the Privative sector...

A partir de aquí: Sólo tecnologías libres





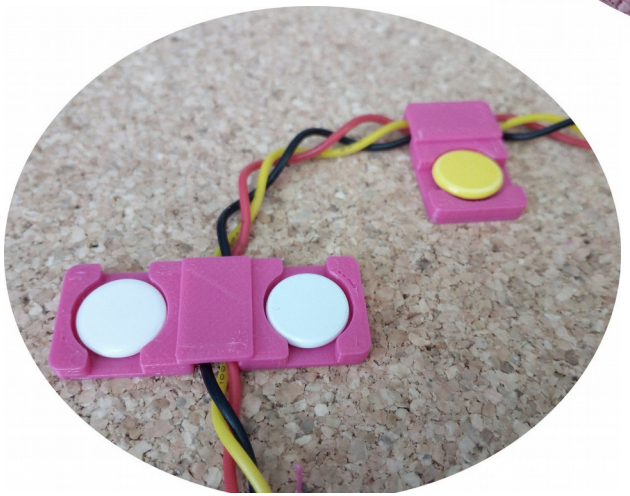




¿Qué vamos a usar?

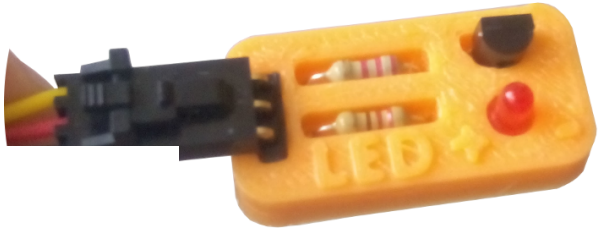
Panel de corcho (28x19cm)

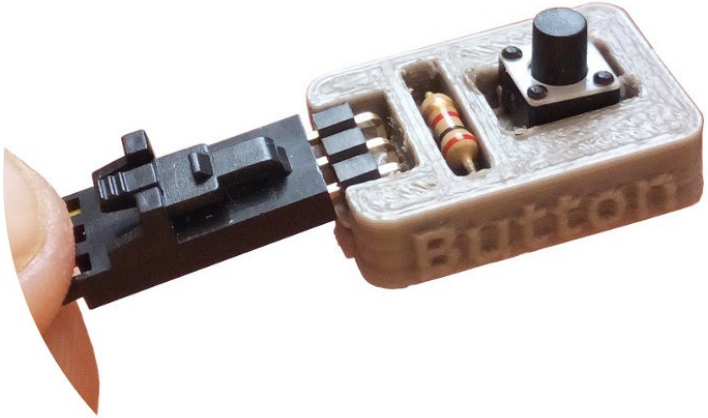
Piezas Impresas en 3D para fijar elementos al corcho

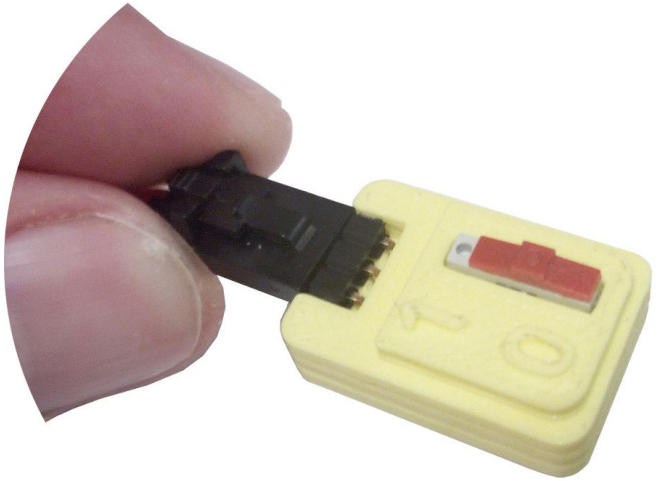


Periféricos

PCBprints: Mini-circuitos impresos en 3D

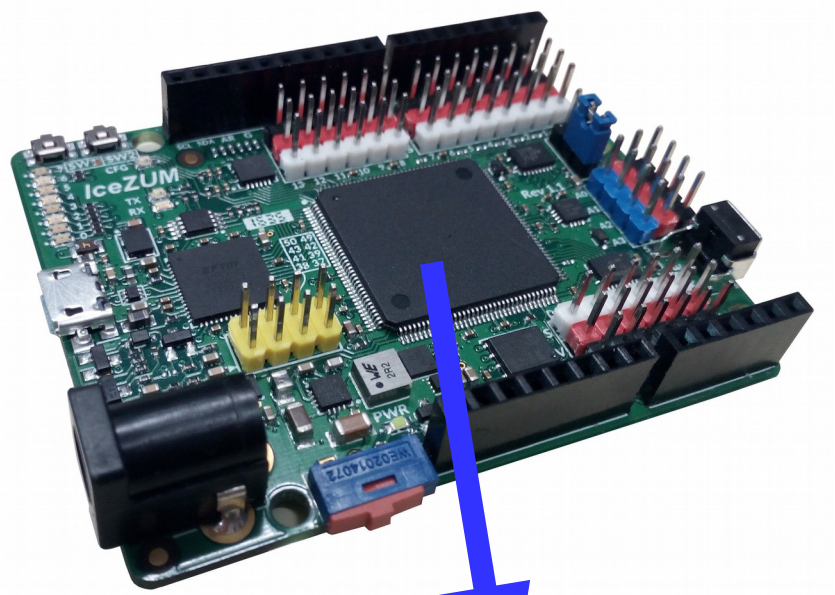






Icezum Alhambra v1.1

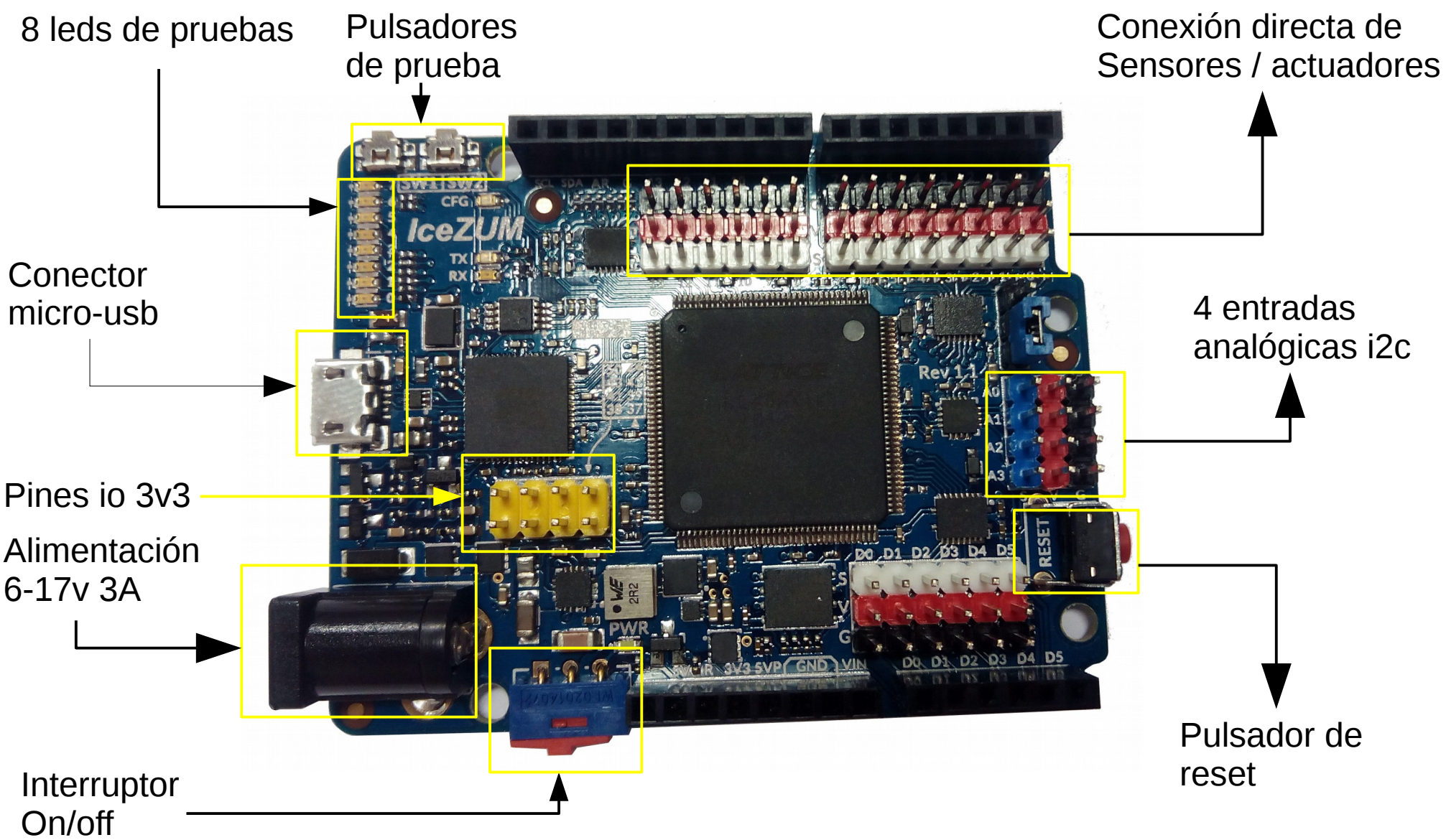
https://github.com/FPGAwars/icezum/wiki



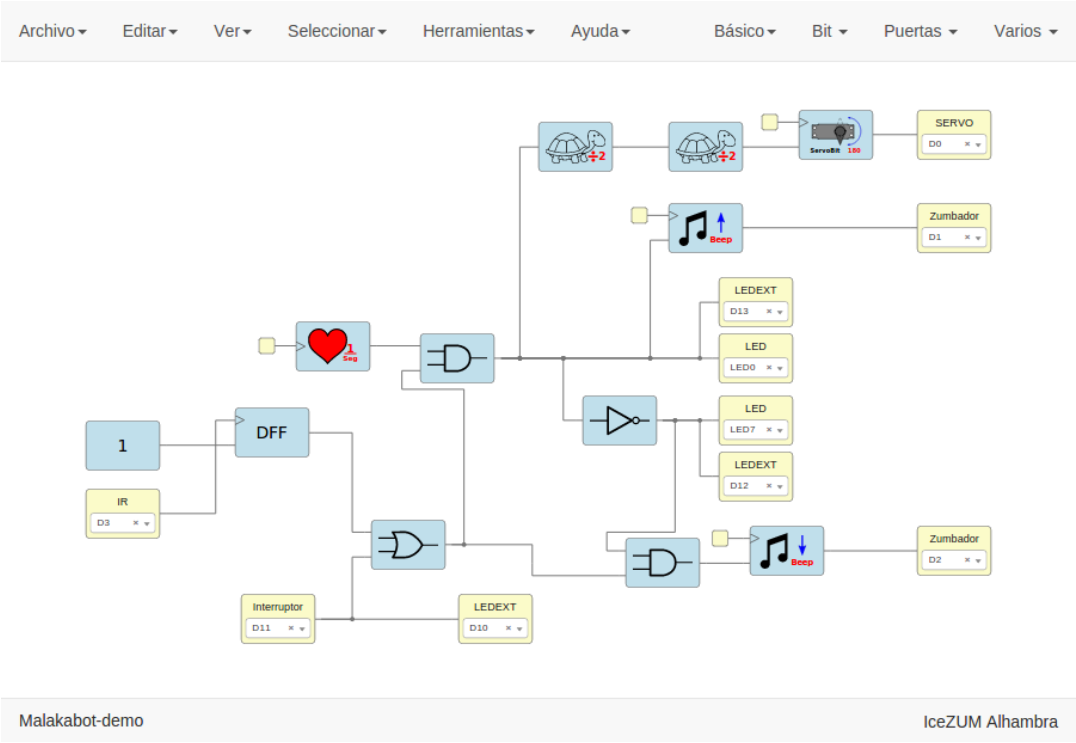
FPGA Libre

- Autor: **Eladio Delgado**
- Diseñada en Pinos del Valle (Granada)
- Arduino de las **FPGAs**
- Compatible Arduino
- Fácil conexión de circuitos externos/sensores/servos
- Reutilización de los shields de arduino
- 20 entradas/salidas de 5v
- 3A corriente de entrada
- Perfecta para hacer robots

Icezum Alhambra v1.1



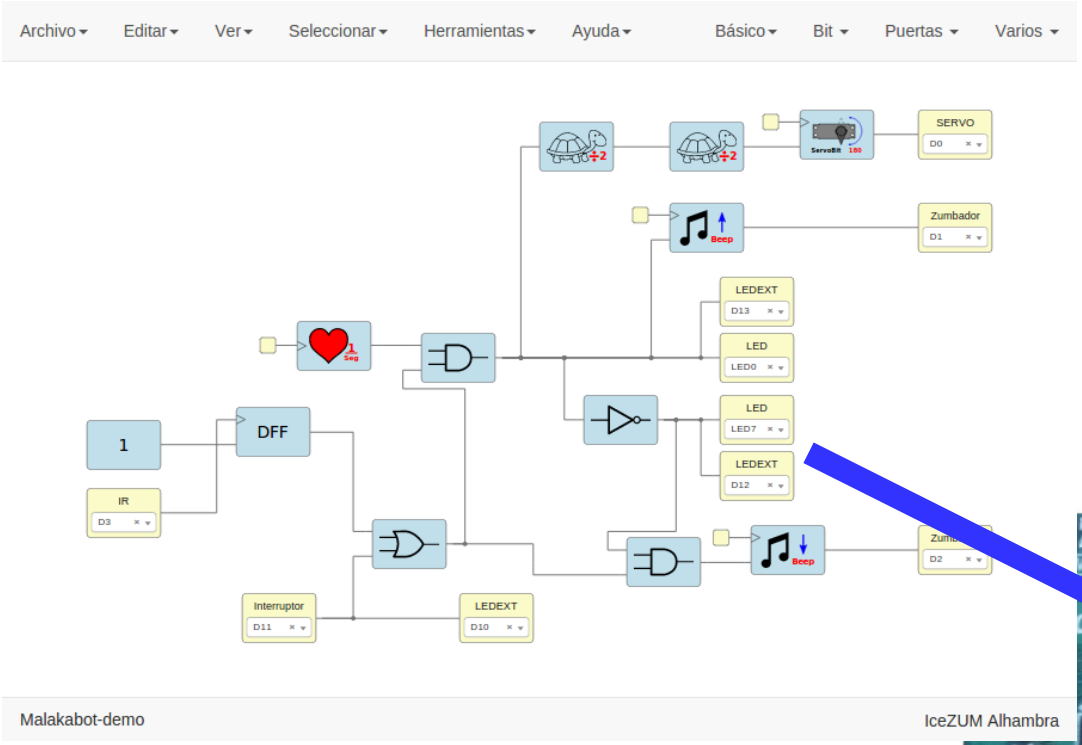
icestudio

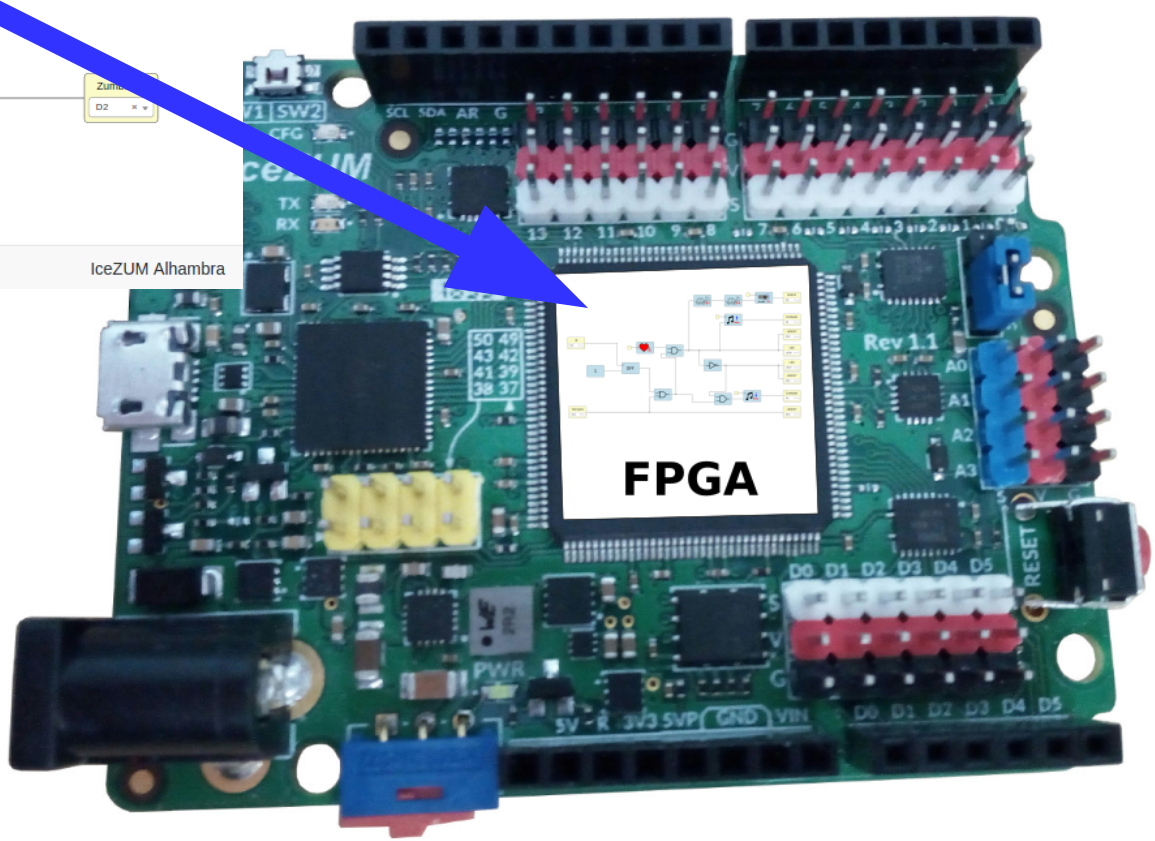


https://github.com/FPGAwars/icestudio

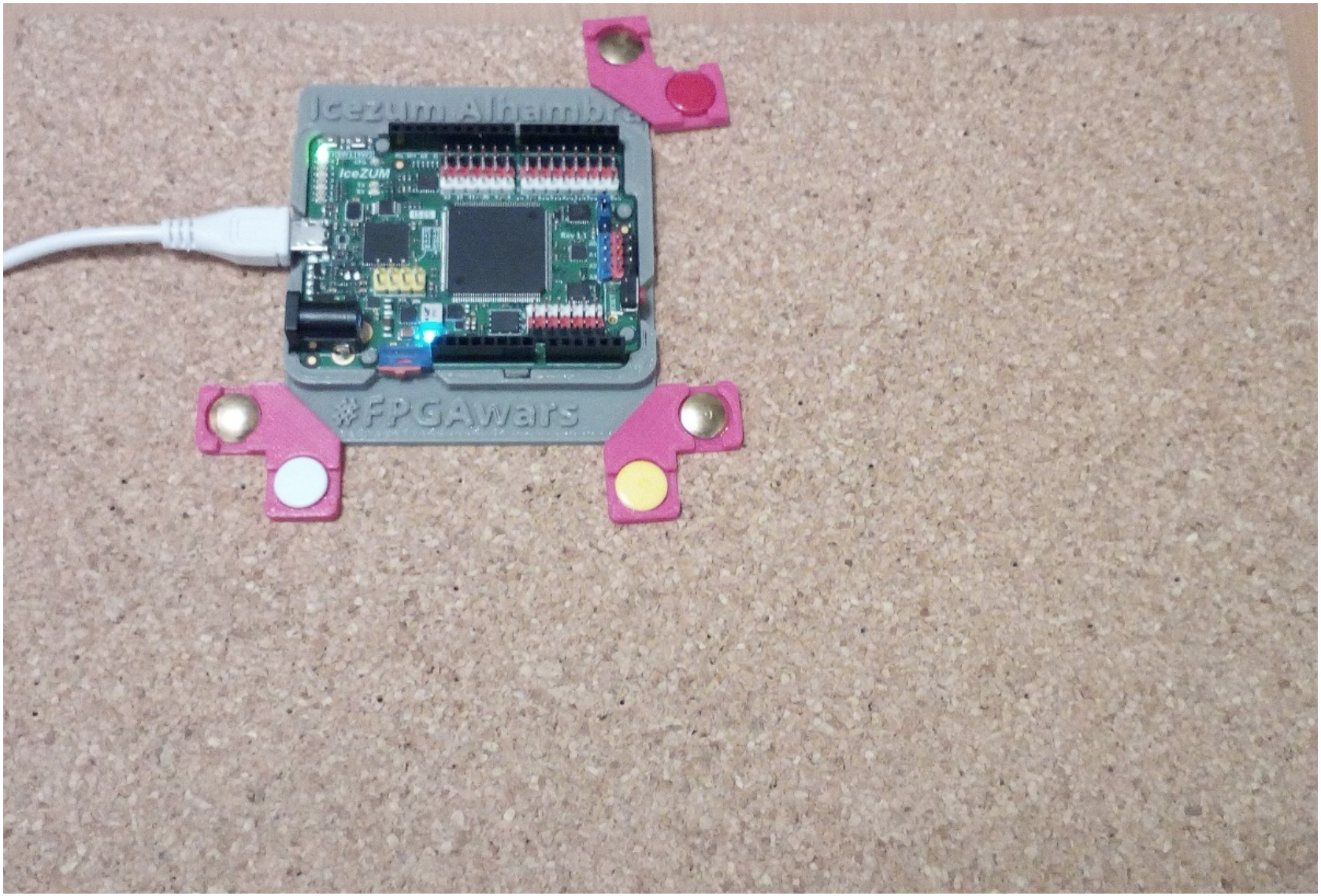
- Autor: **Jesús Arroyo**
- Electrónica digital para todos
- Herramienta visual
- Traduce a verilog

La magia de las FPGAs



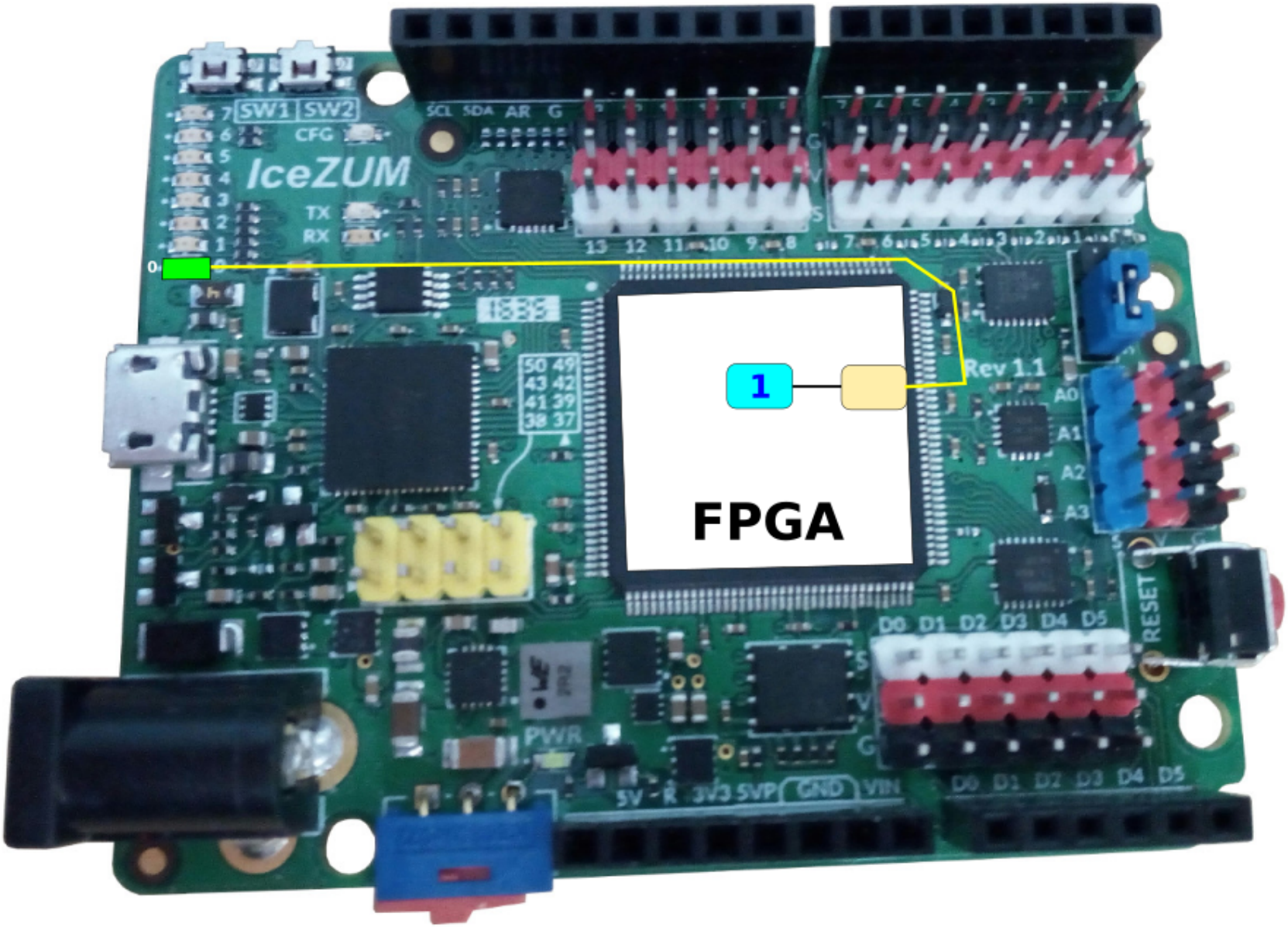


¡Empezamos!

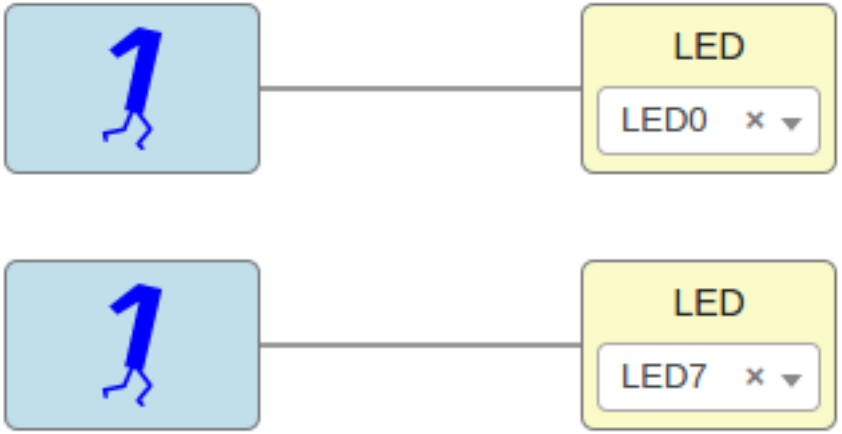


Ejemplo 1: Hola Mundo

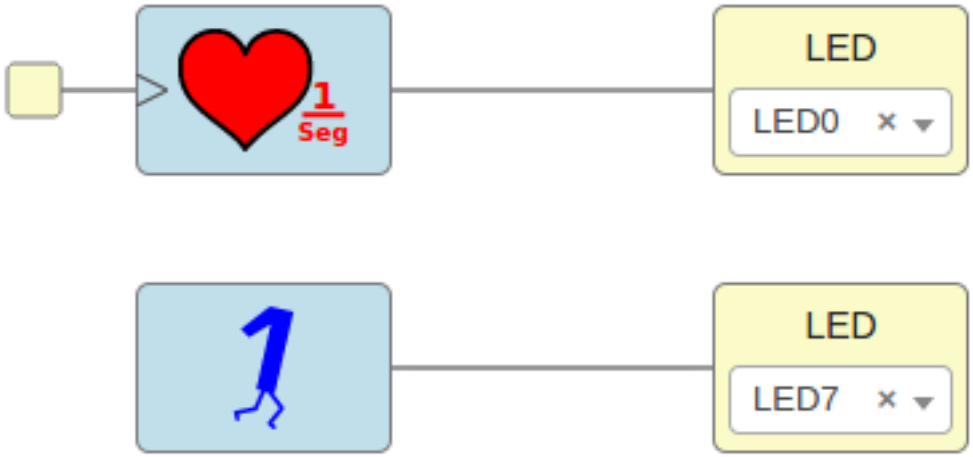
Hola mundo: Implementación física



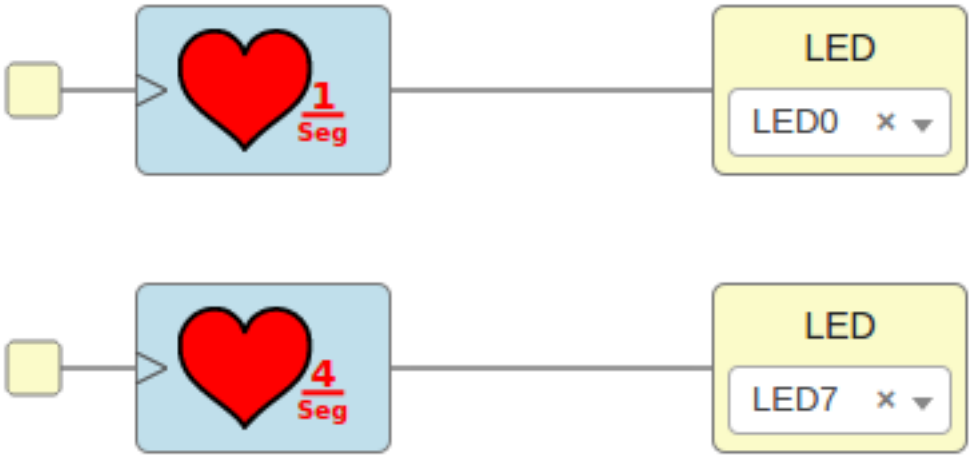
Ejemplo 2: Dos leds en paralelo



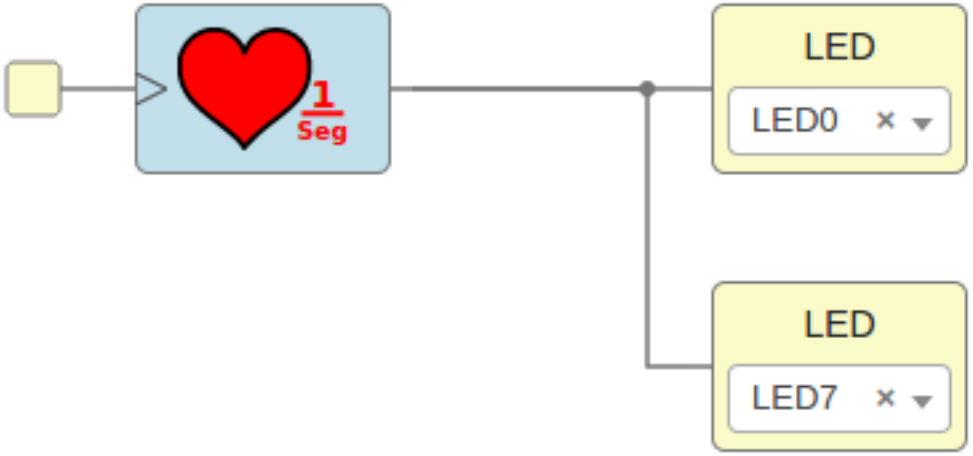
Ejemplo 3: Led pulsante



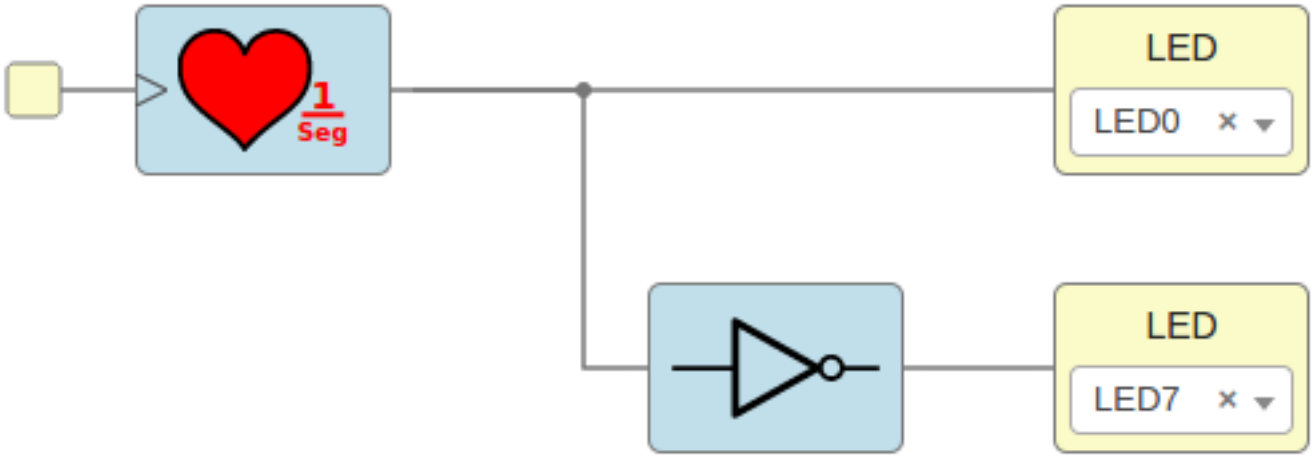
Ejemplo 4: Leds pulsantes Diferentes ritmos



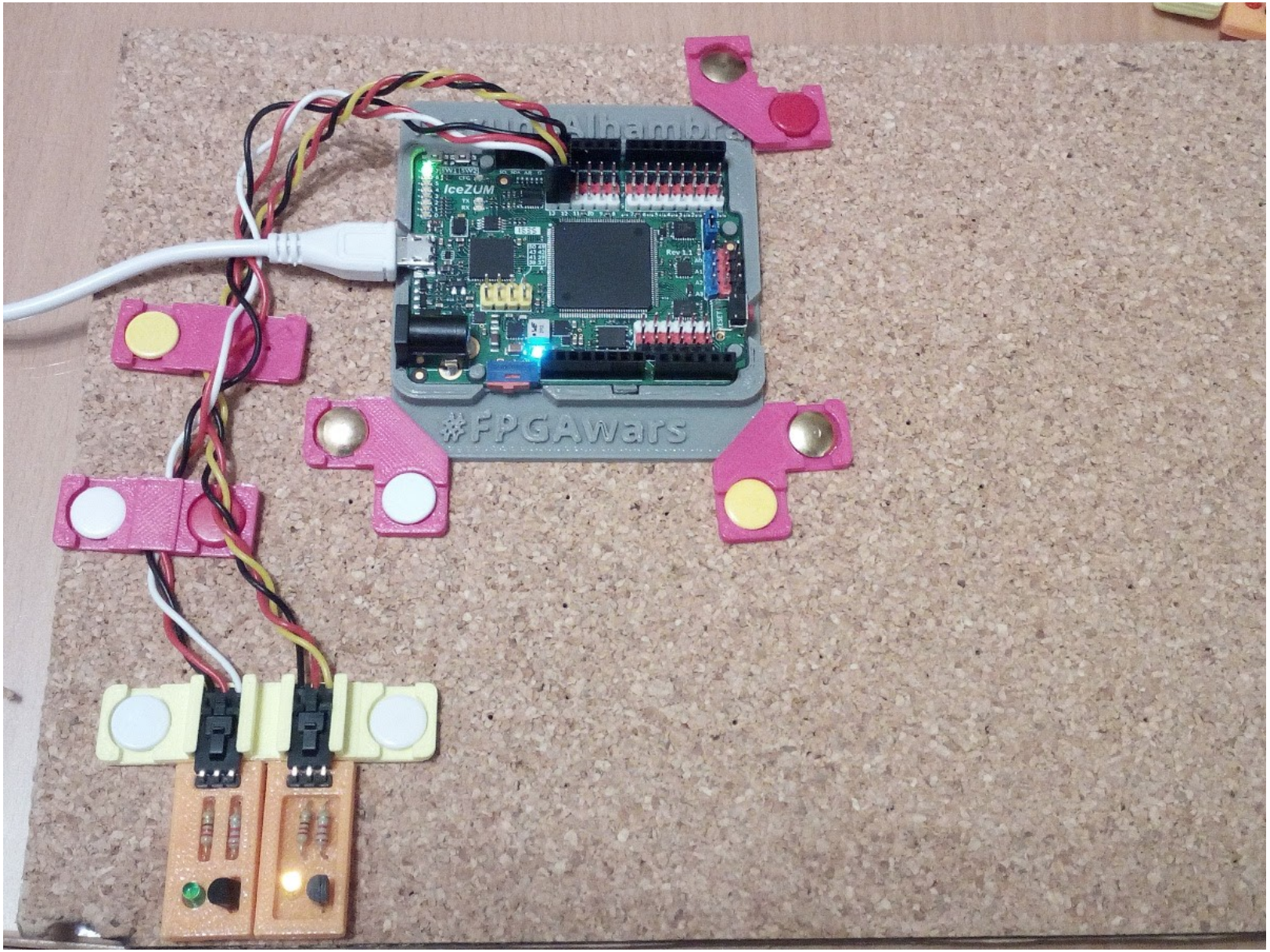
Ejemplo 5: Leds pulsantes
Mismo ritmo



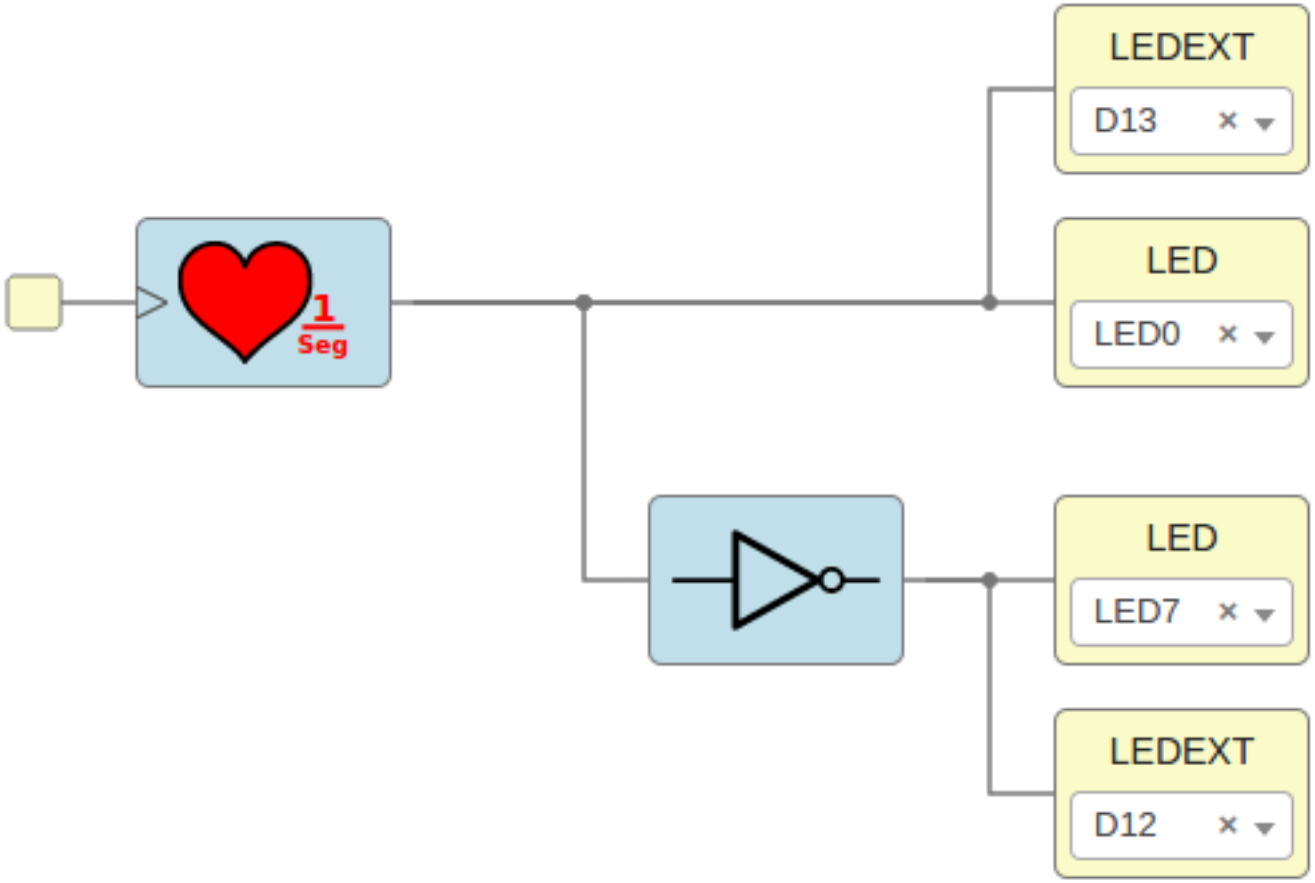
Ejemplo 6: Leds alternativos



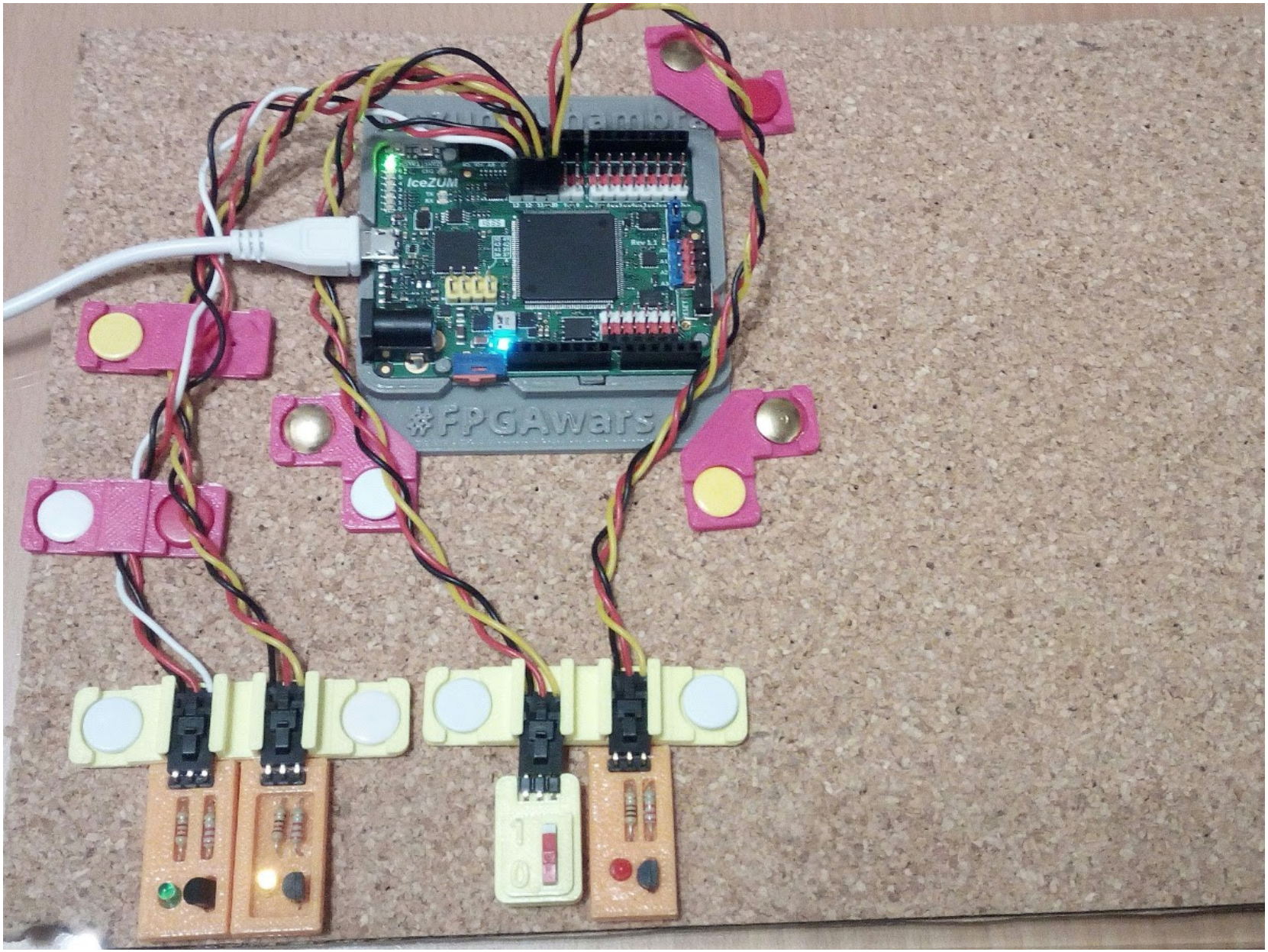
Periféricos: Leds externos



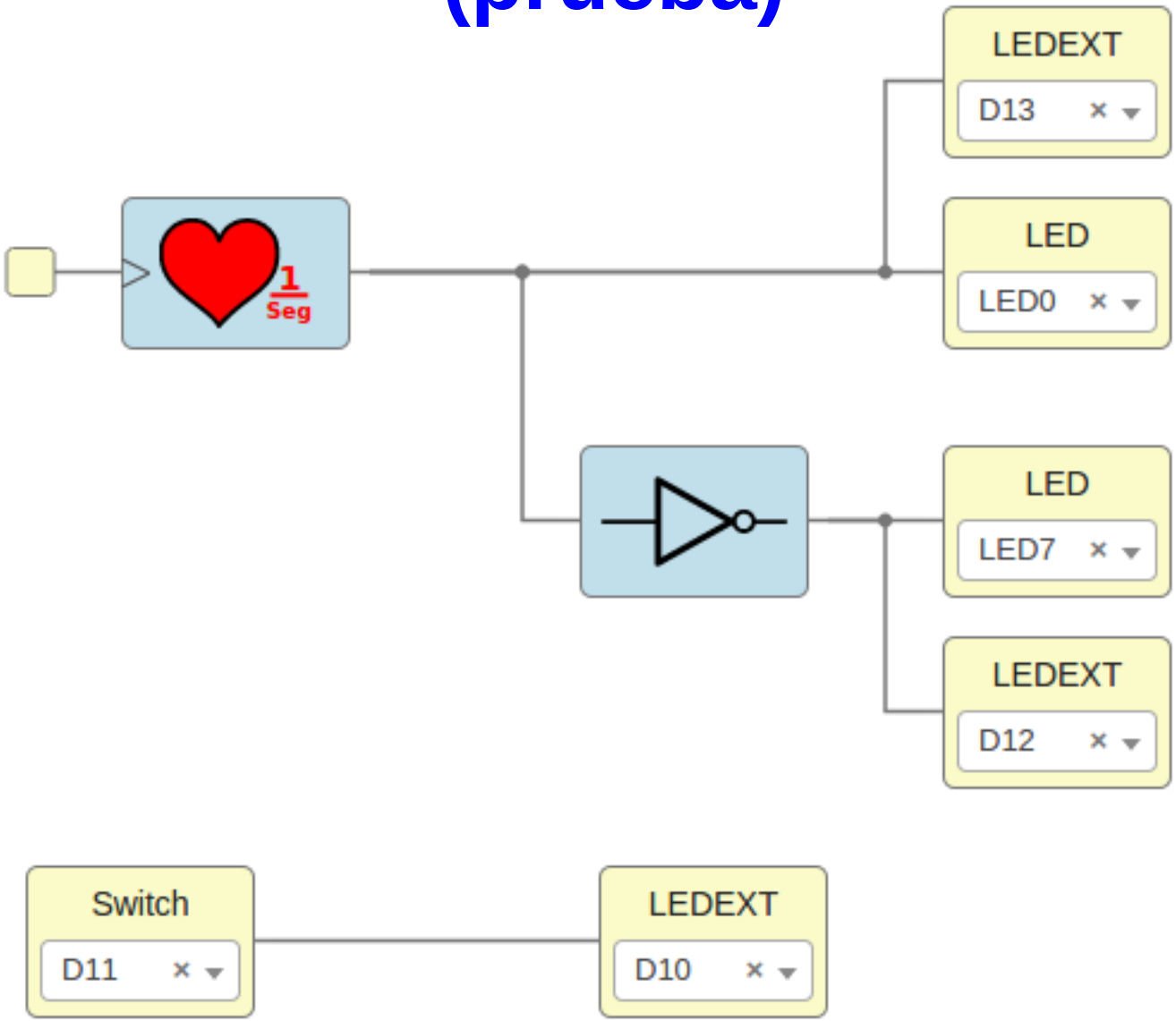
Ejemplo 7: Leds externos



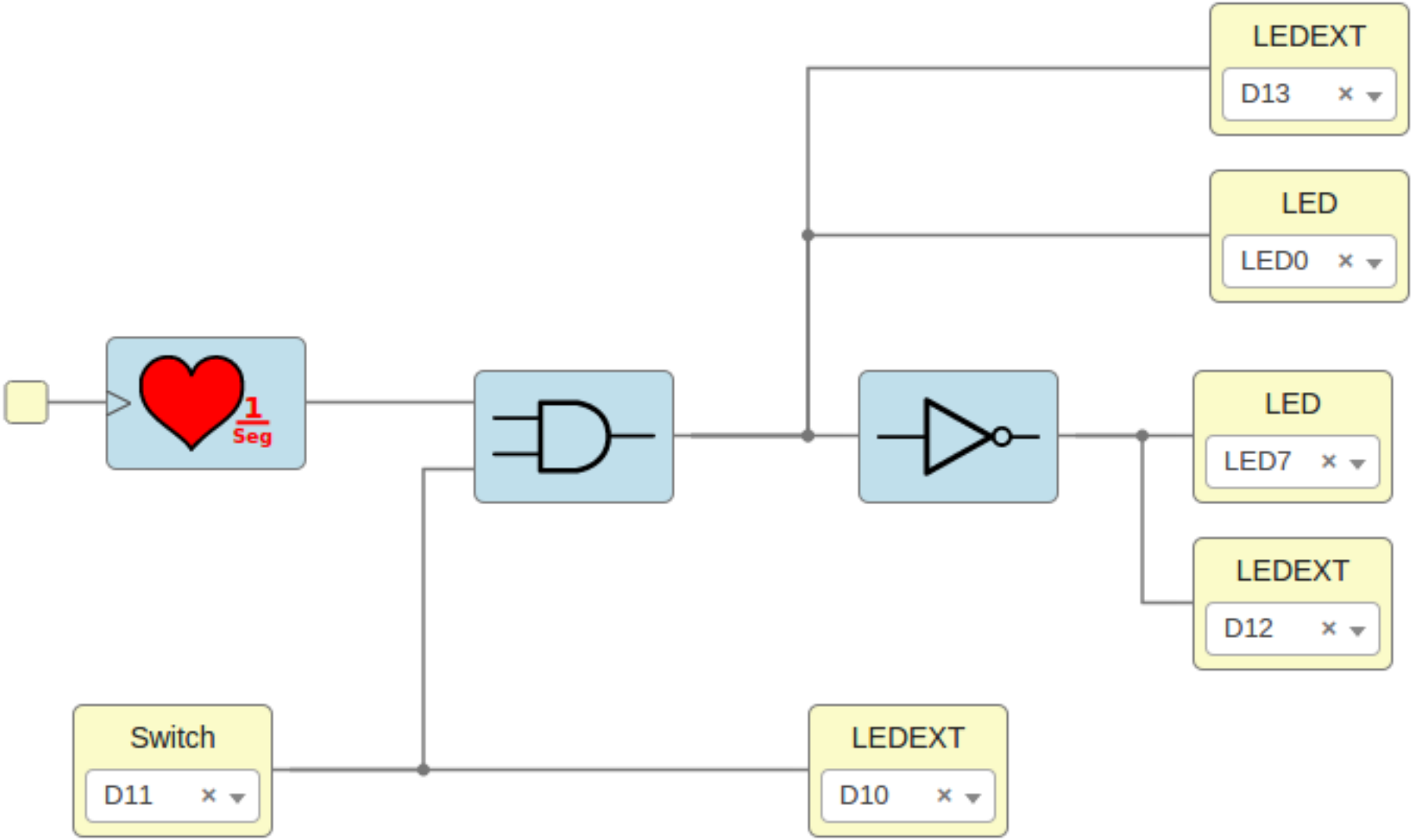
Periféricos: Interruptor externo



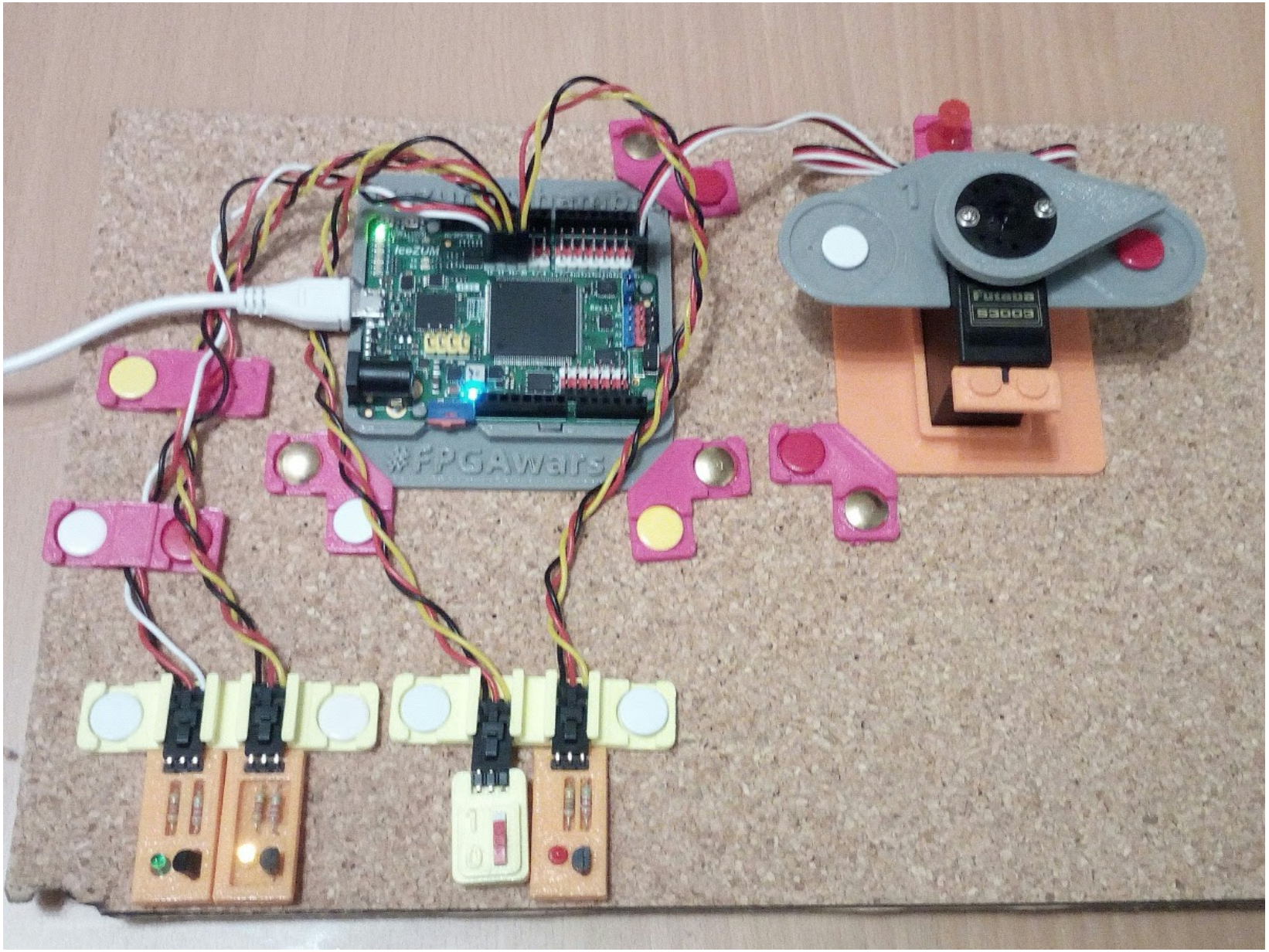
Ejemplo 8: Interruptor Externo (prueba)



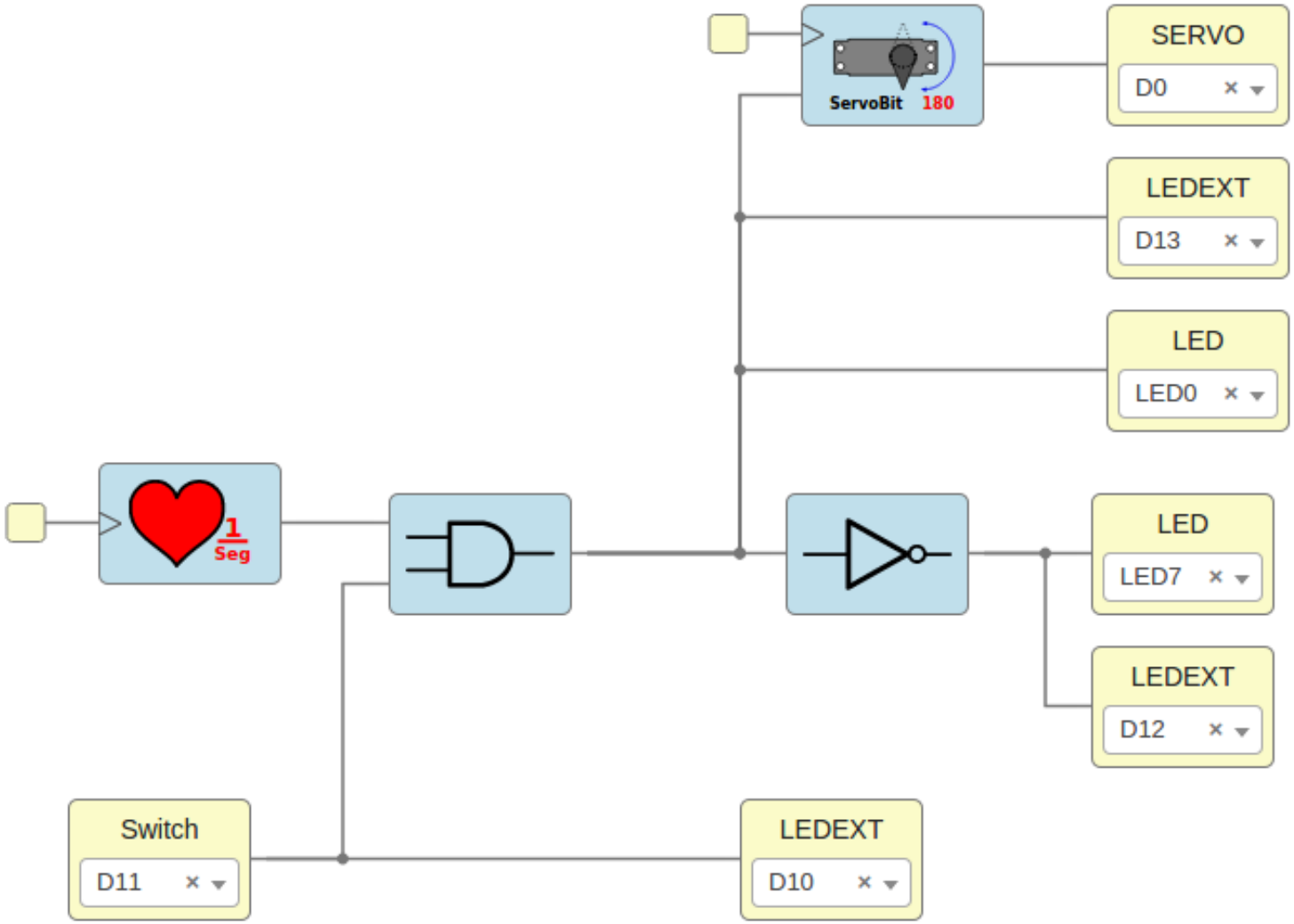
Ejemplo 9: Interruptor Externo



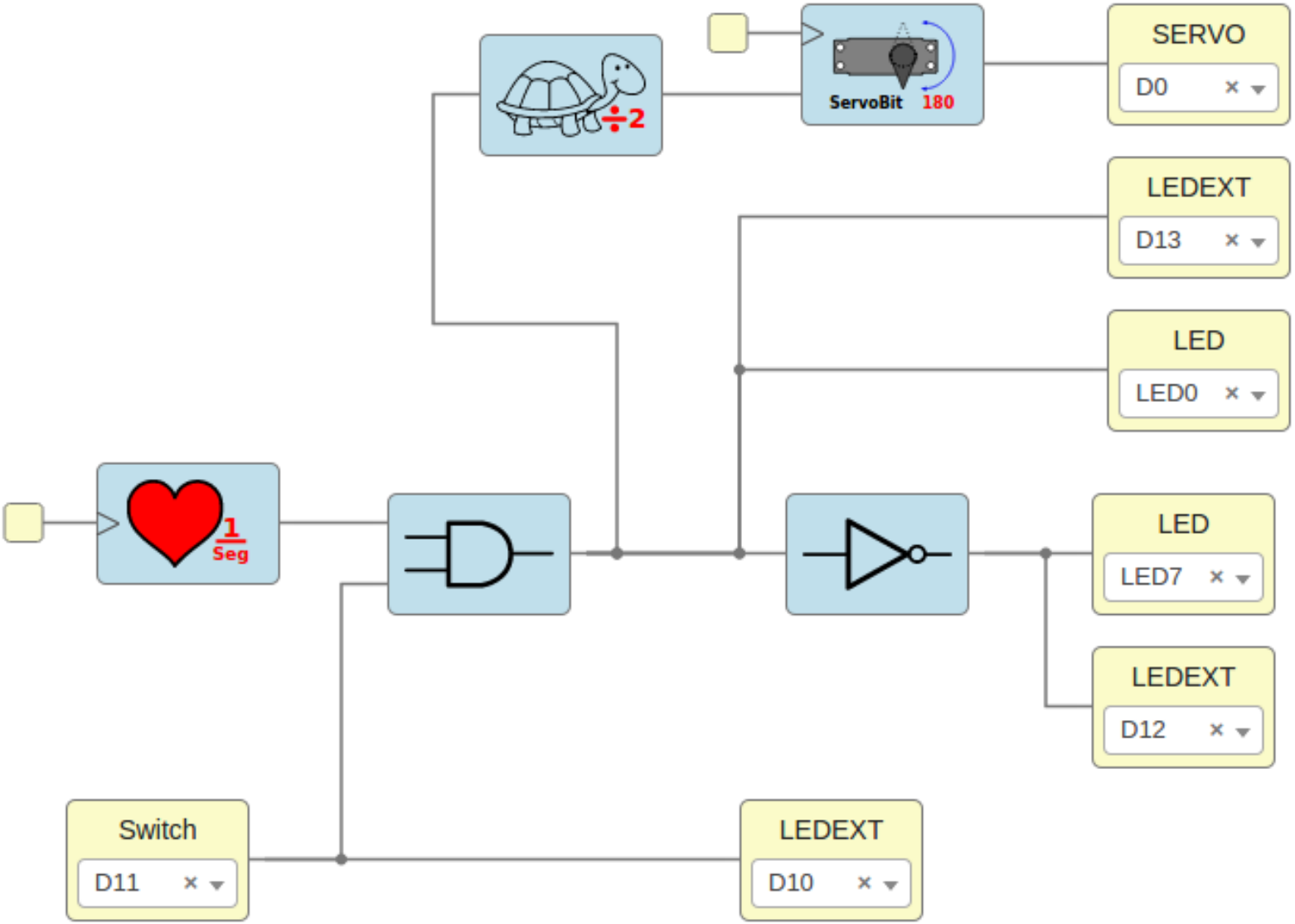
Periféricos: Servo



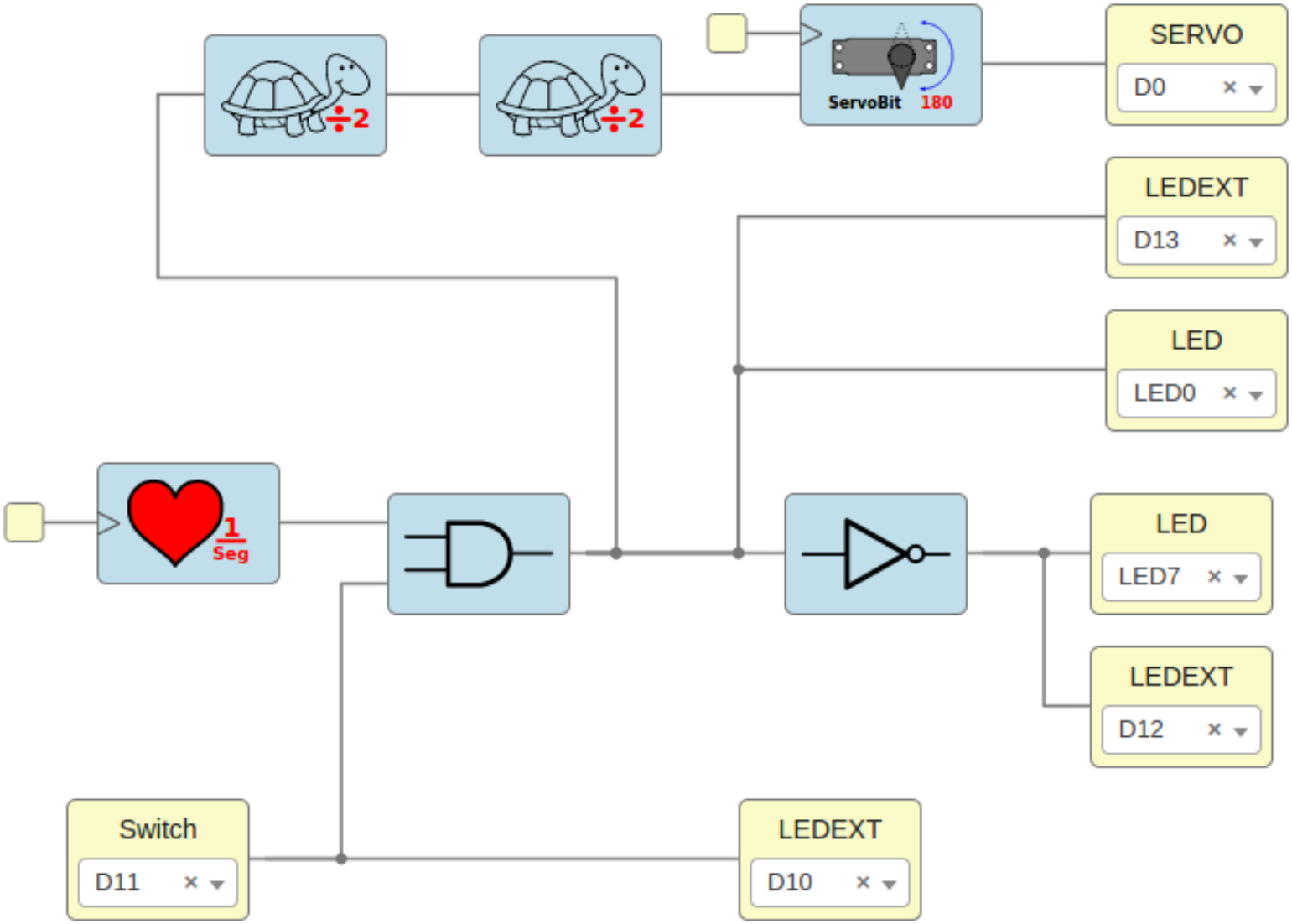
Ejemplo 10: Servo binario



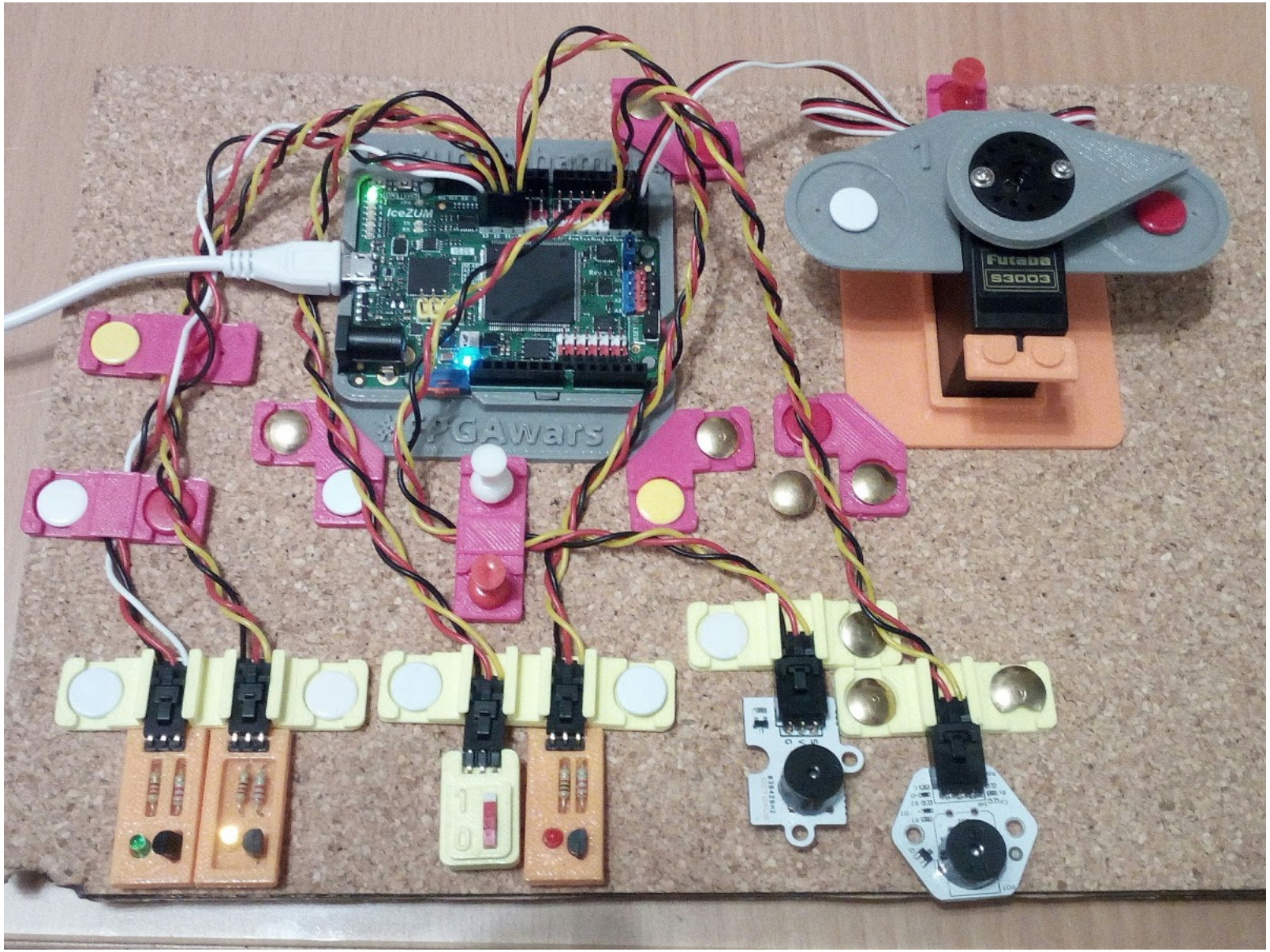
Ejemplo 11: Bajando el ritmo



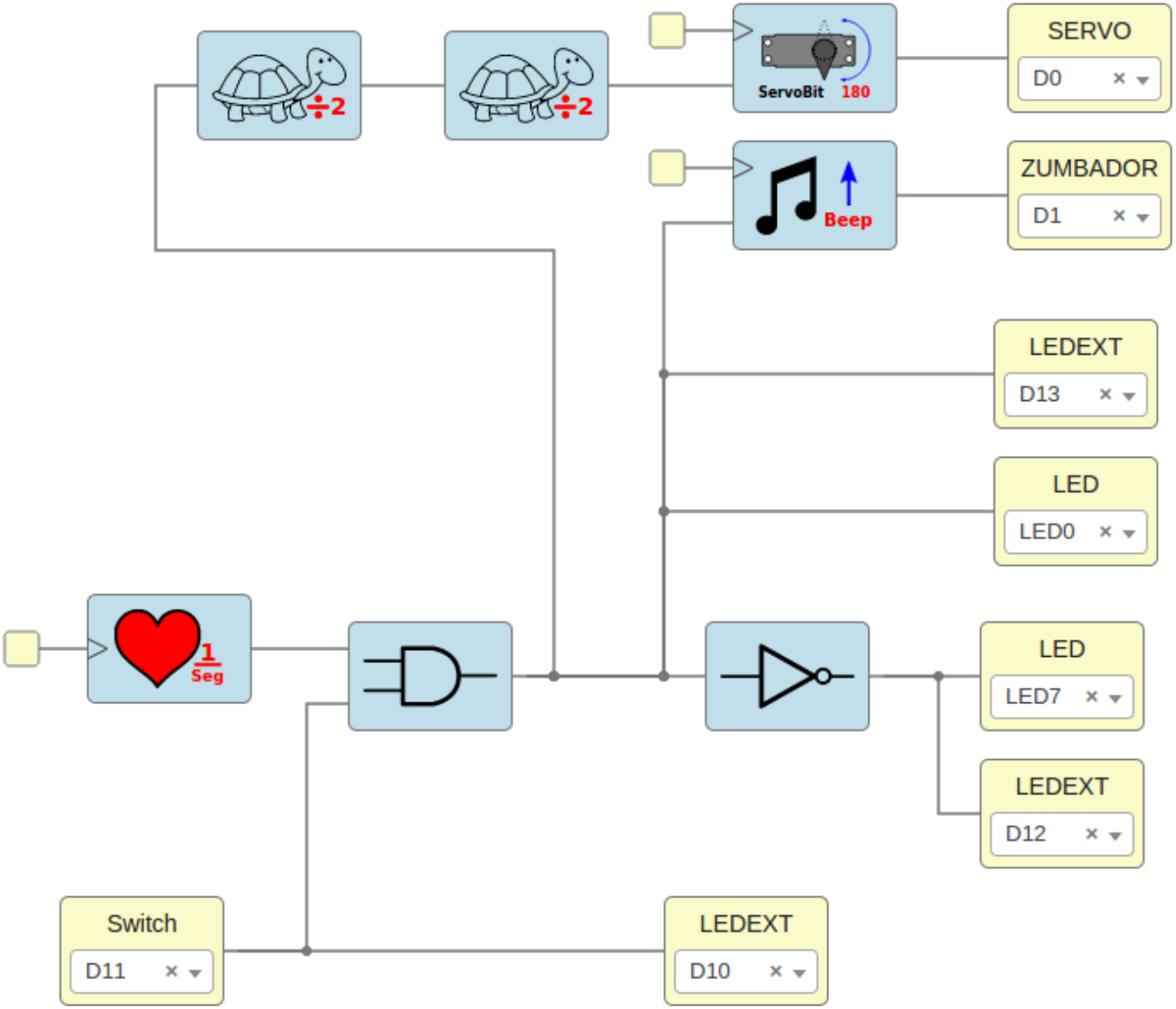
Ejemplo 12: Bajando el ritmo más



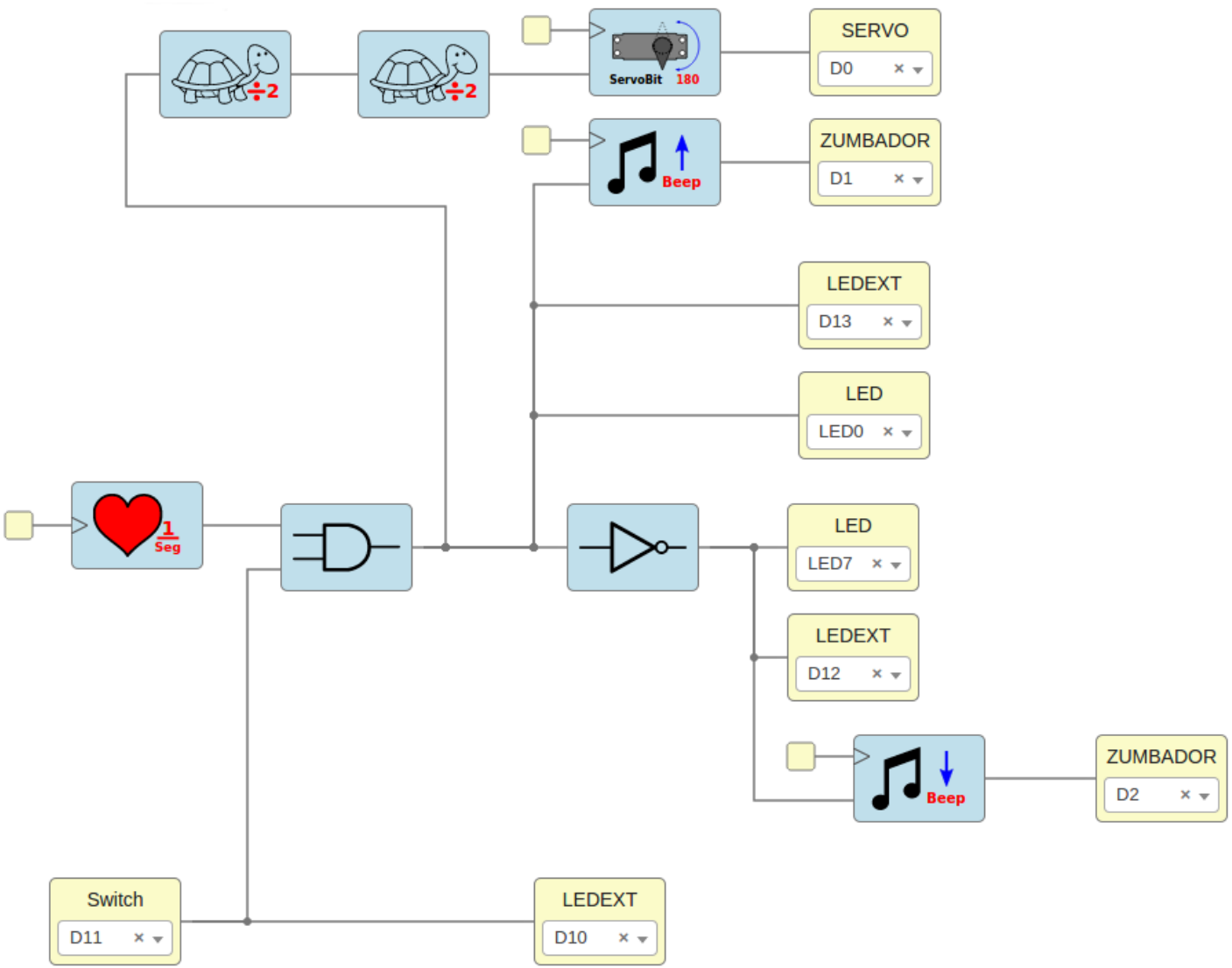
Periféricos: Zumbadores



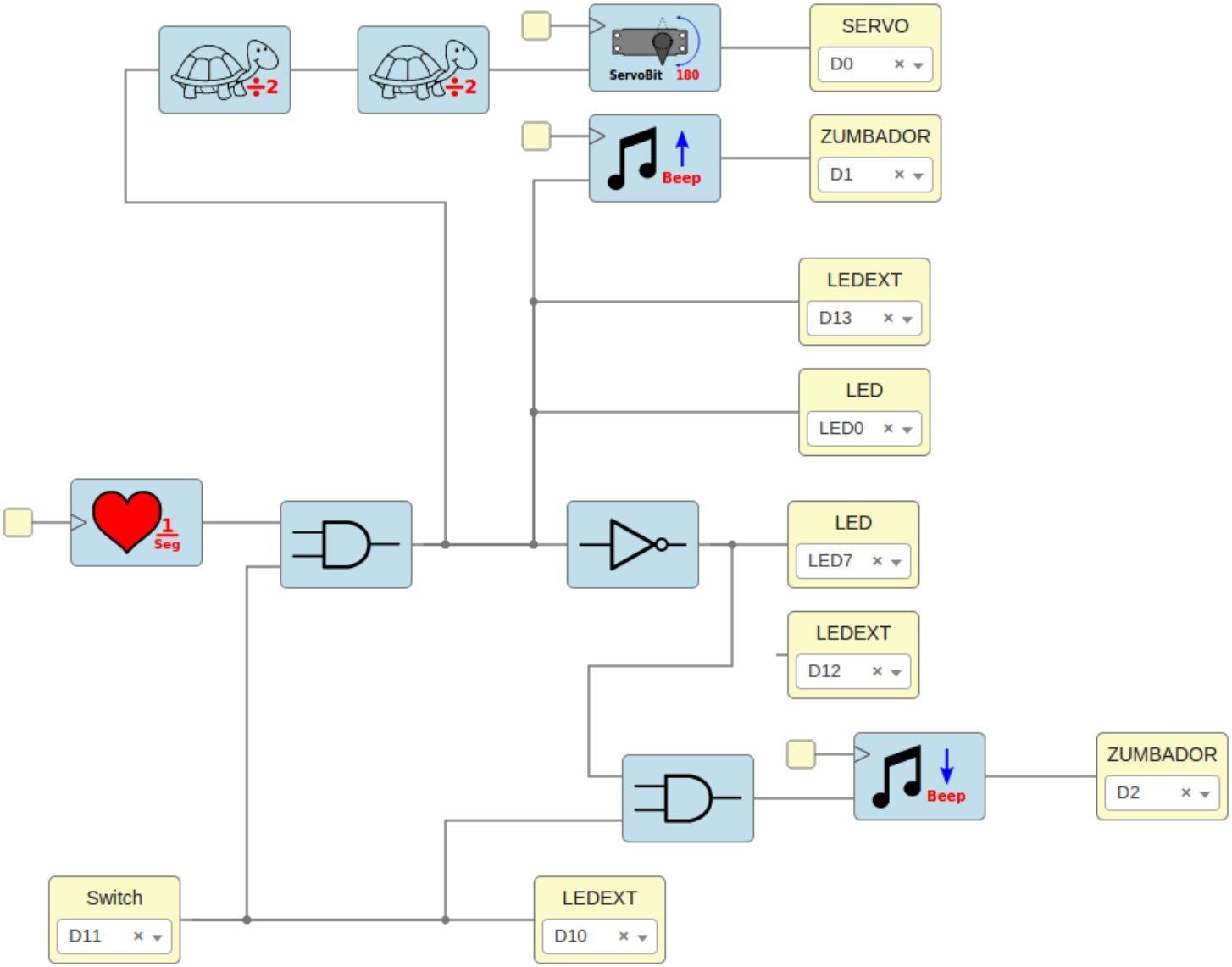
Ejemplo 13: Zumbador



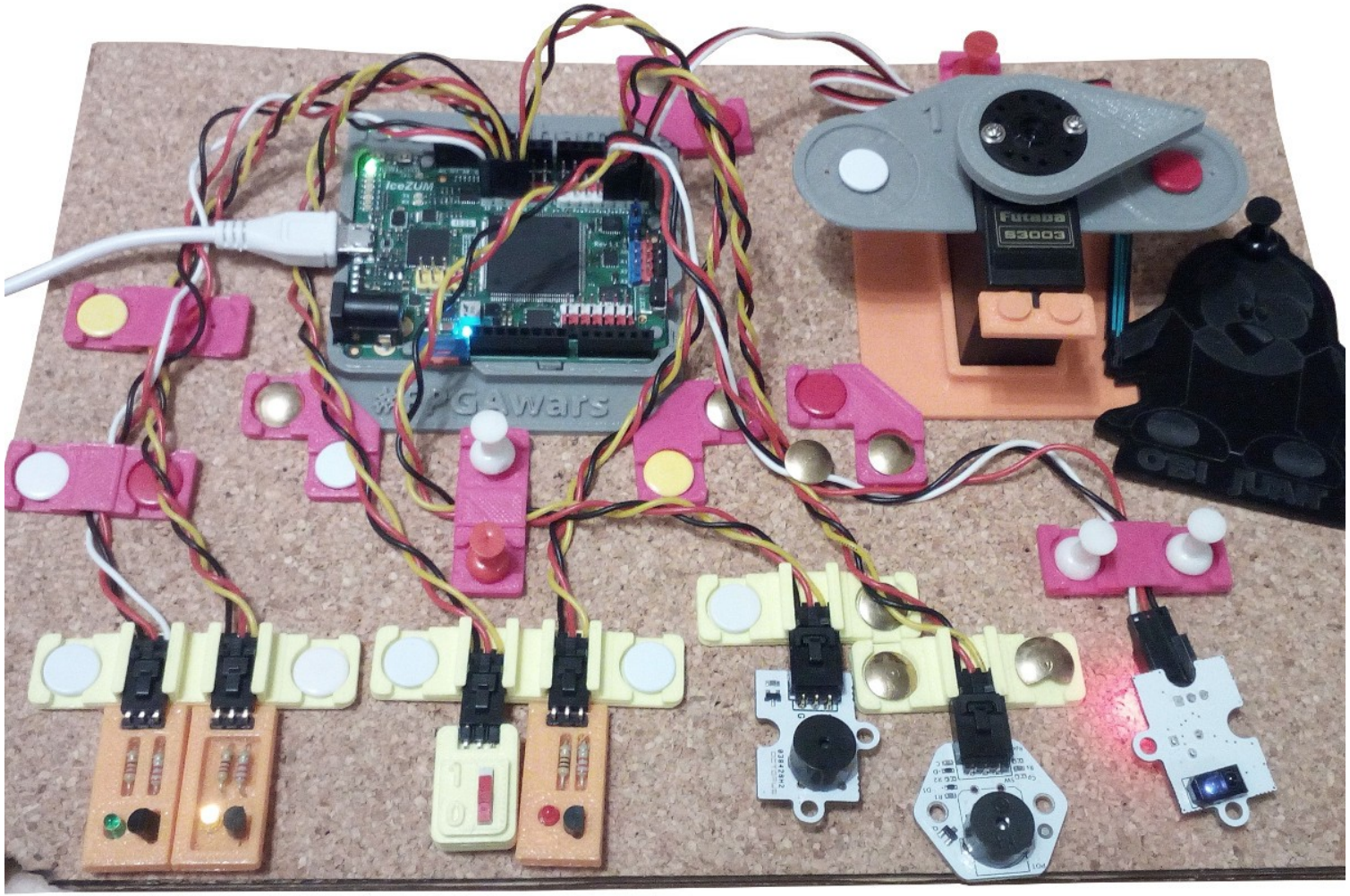
Ejemplo 14: Sirena



Ejemplo 15: Sirena v2

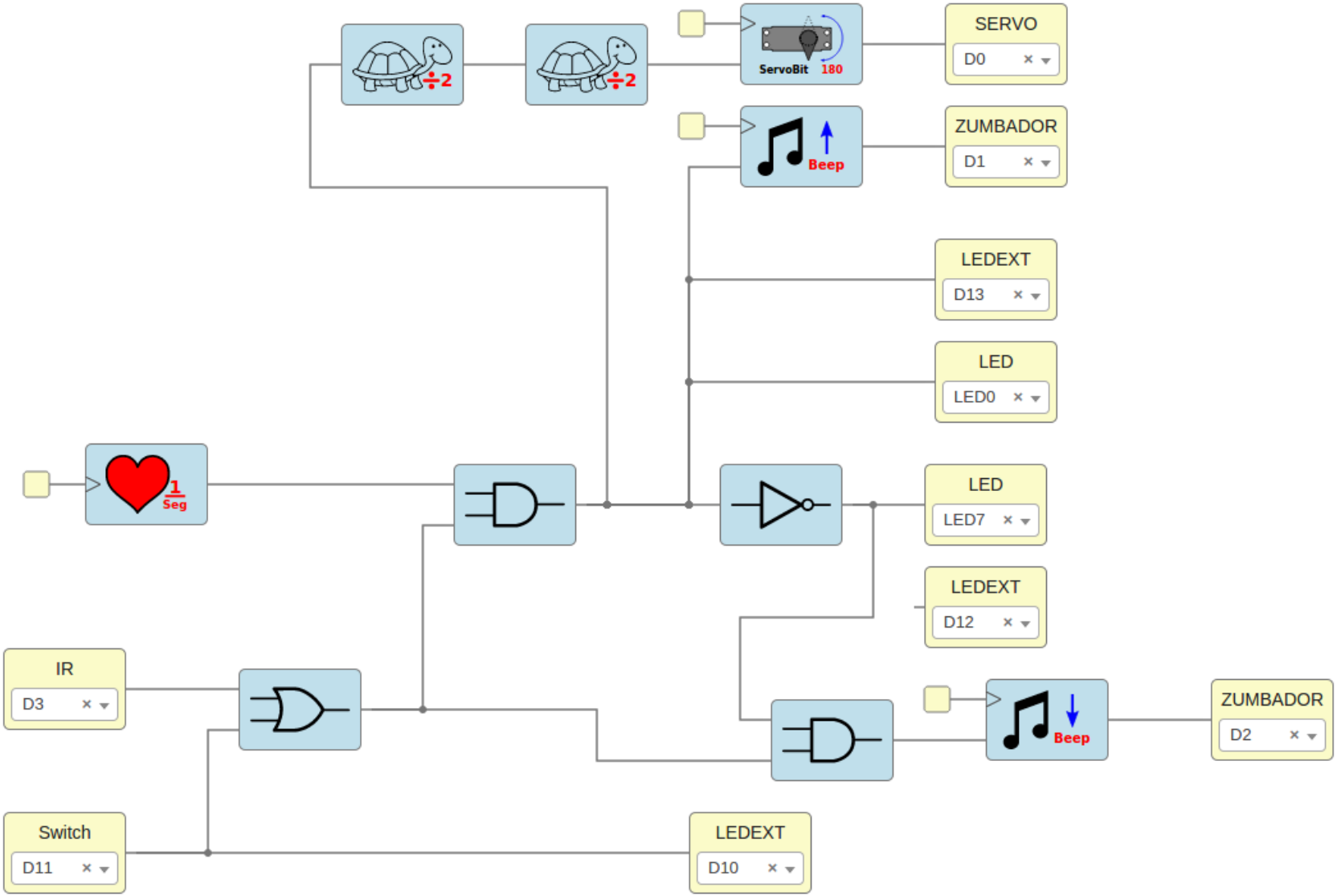


Periférico: Infrarrojos (IR)

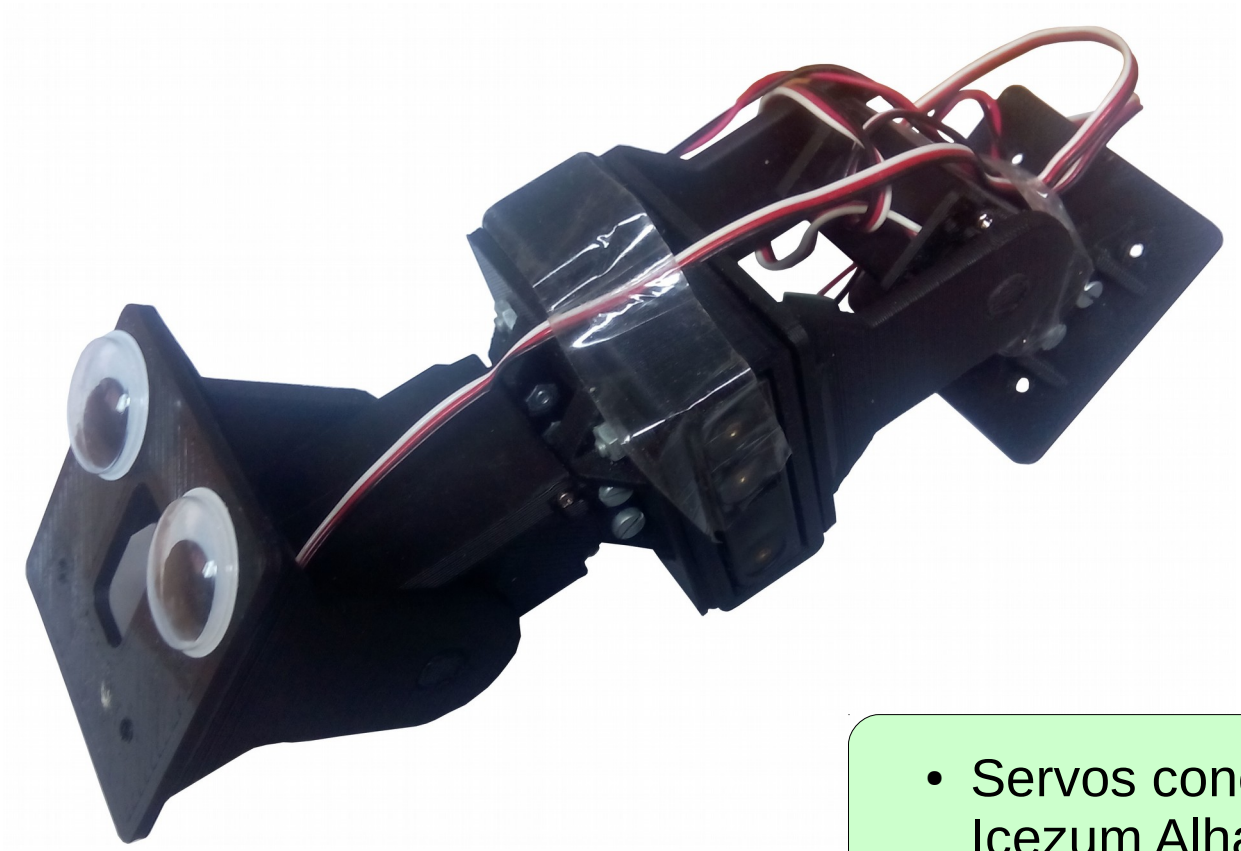


Ejemplo 16: Test IR

Ejemplo 17: Alarma v1.0

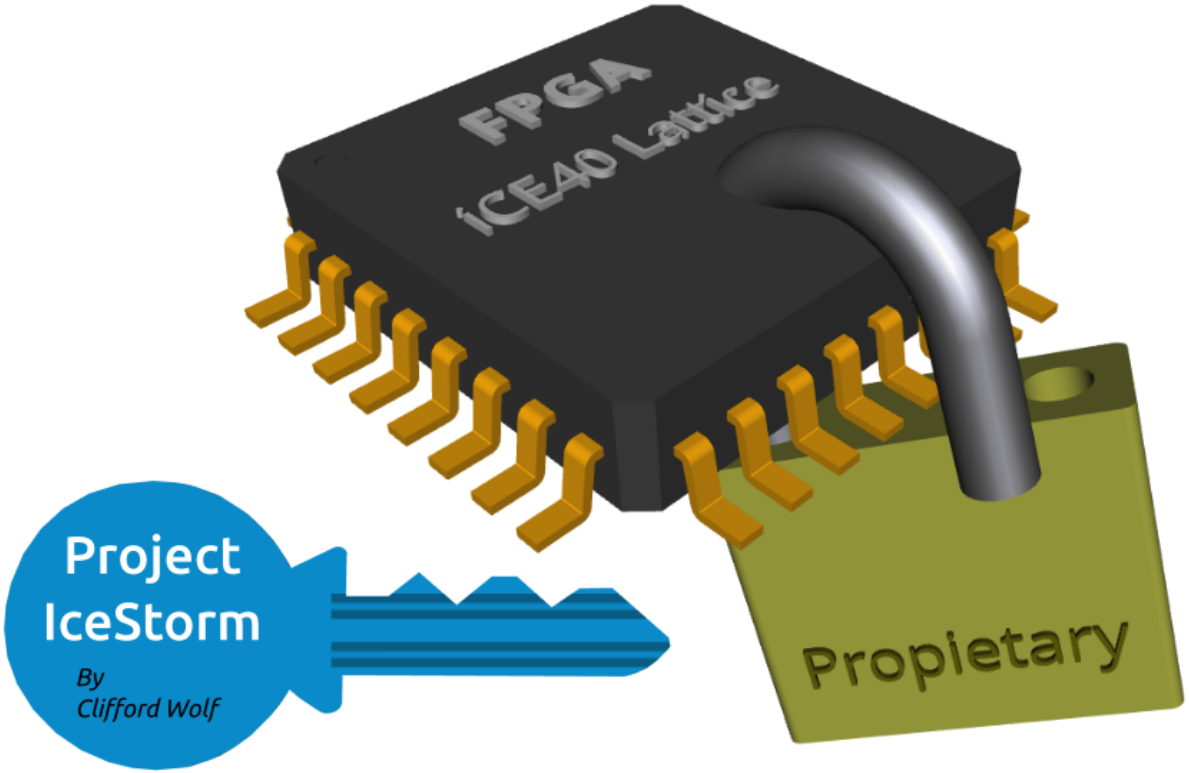


Larby: Robot modular



- Servos conectados directamente a Icezum Alhambra
- Configuración mínima pitch-pitch
- Módulo impresos en 3D

FPGAs libres: El renacimiento



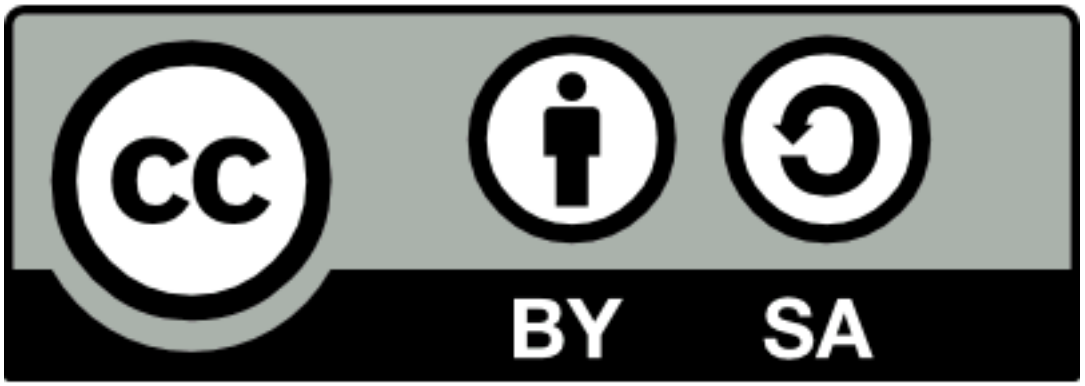
- Proyecto Icestorm (Mayo, 2015)
- La primera *toolchain* que permiten pasar de Verilog al bitstream usando sólo Herramientas libres

Comunidad FPGAwars

- Comunidad para **compartir conocimiento** relacionado con **FPGAs libres**
- Es el **clonewars** de las FPGAs, pero en modesto :-)
- Idioma: Castellano
- 324 miembros
- Cualquier pregunta / comentario / sugerencia → Correo a la lista :-)

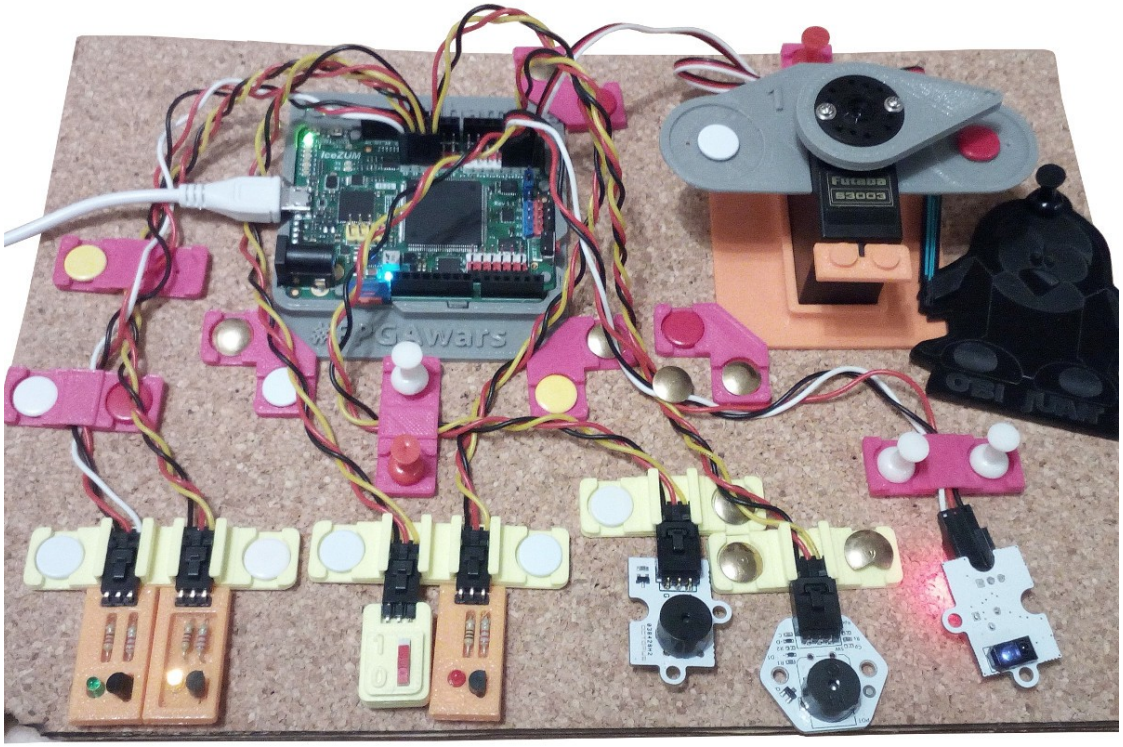
http://fpgawars.github.io/

¡Comparte con la comunidad!



¡Que las FPGAs libres os acompañen!

Electrónica digital divertida con FPGAs Libres



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MÁLAGA

https://github.com/Obijuan/myslides

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