Edu-C - Specifications and Library Calls

All links (mostly in french) under www.didel.com/educ/EduC.html

What is an Edu-C?

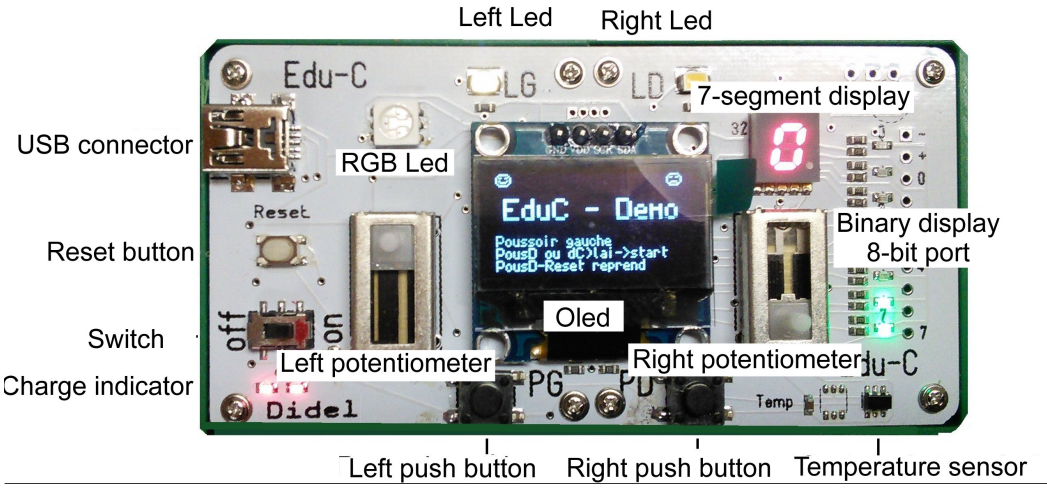
It is an "Arduino" card already populated with motivating input-outputs, easy to be connected to a PC so you can learn to program, modify the documented games, invent new ones.
Moreover, it is autonomous with its Lipo battery. www.didel.com/educ/EduC-Specs.pdf

Why an Edu-C?

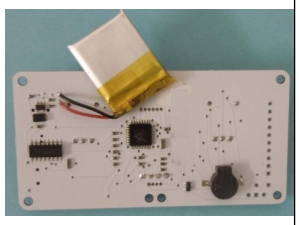
Arduino is perfect for understanding how to interact with the processor pins, but adding wires for more devices is not reliable. Arduino software for beginners is simplistic and focuses too much on "standard" components and libraries.

Who is Edu-C for?

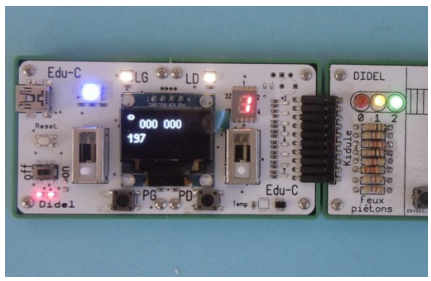
Curious. What does a real programming language look like? It's not too complicated for me? 12 years old, is it too young?	***EduC-Entree*** insist on what has to be coded before using the right C instructions. Wait for something, repeat as long true, iterate are like phonetic sript when learning a foreign language. www.didel.com/educ/EduC-Entree.pdf
Interested. I want to start, but it must be fun. If I like it, I'll learn in due time.	***EduC-Fun*** explains how we get to the game of ping-pong by first playing with simple programs to read knobs, position objects on the screen, compare values. Reflex games are first easy steps.. www.didel.com/educ/EduC-FunE.pdf
Concerned. A language, I know that it must be learned patiently; I like math and logic games, programming offers lots of possibilities. Ok for a first class with nice I/O devices. I will then be ready for C++, Java, Python.	***EduC-AllC*** introduces the C language in 7 modules and uses many simple examples to understand the basic concepts of procedural languages. www.didel.com/educ/EduC-AllC.pdf *Nota bene: Our docs are recent, partially tested. Interact to improve and evolve them.*

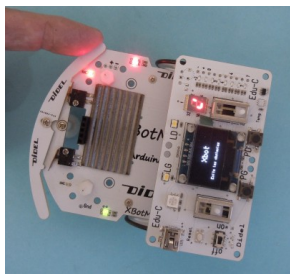


Underside
AVR328 processor
USB CH340 driver
Lipo Charger
Transistor
Buzzer



The Edu-C is equipped with two push-buttons (PG PD), two white Leds (LG LD), a tri-color Led, two potentiometers and a temperature sensor. Eight bits are assigned both to a 7-segment display and to a set of 8 Leds next to a connector.
The Oled display of 128x64 pixel presentsgraphic, textes and numbers. By adding the side connector you can interact with the educational Kidules (traffic lights, motor step-by-step, ..) or with the Xbot robot base.





Getting started

Snap. Two red LEDs indicate if the battery is fully charged. Recharge via USB if one LED is faded. It's the 7-segment display that consumes the most; it empties the battery in 2 hours.
Sixteen demo programs are loaded in flash memory, easy to understand, modify, complete.
At startup the program displays a 0. As long as the left LED is flashing, you can act on the left pusher to increase the value (saturates at F). If you press on the right pusher, or without action for a few seconds, the demo corresponding to the digit is called. The push button "reset" restarts the choice, but if the right pusher is pressed while the program starts, the lastly called demo is executed . Demos are explained on www.didel.com/educ/EduC-Demos.pdf

Program Edu-C

EduC uses the Arduino IDE and needs the USB CH340 driver. You may have to install the WS340 driver. See www.didel.com/EduC-Install.pdf)

You have to select Duemilanove, AVR328 in the Arduino Tool menu and with Windows choose the highest port of no. On Mac, the letters WCH are part of the driver name.

Libraries EduC.h and Oled.h - details under www.didel.com/educ/EduC-Fonctions.pdf

Macros and functions of EduC.h - **setup** SetupEduC();

Del60us();Del200us(); Délais de 60 et 200 microsecondes, exceptionnellement utilisés
DelMs(v16); Délais de v16 ms, 1 à 32767 millisecondes (v8, v16 sont des variables de 8, 16 bits)

```
LedGOn; LedGOff; LedGToggle;          LedDOn; LedDOff; LedDToggle;
RougeOn; RougeOff;   VertOn; VertOff; BleuOn; BleuOff; BlancOn; BlancOff;
LedG(v5); LedD(v5);  Rouge(v5); Vert(v5); Bleu(v5); *
PousG  !PousG    PousD  !PousD   nb=GetPous(); *
v8= GetPotG();   v8= GetPotD();
HpOn;  HpOff;  tone (14, frequency, duration);
Leds(v8); *  Seg(v8);  Dig(v4);
```

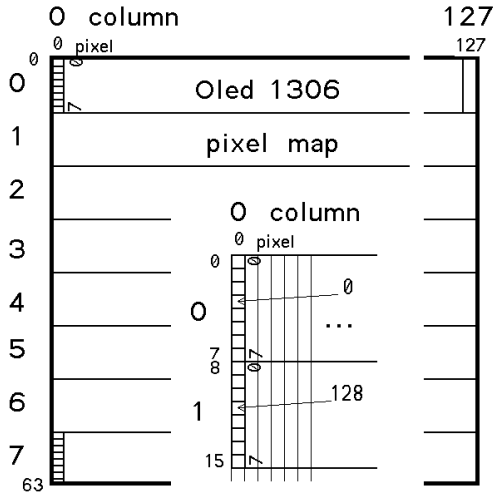
Interruption

The timer 2 manages the pwm for the 5 leds. Compatibility with on / off macros has been achieved.
This timer would allow to schedule events, especially time-out, but it is out of the simple educational goal of EduC.

Functions of the Oled.h library - **setup** SetupOled();

```
v16=GetTemp16();  v8=GetTemp(); *

Car(cc); Text("xx"); Sprite(Smile); Sprite(Sad);
MySprite(nom); * byte nom[]= {liste des bytes};
Bin8(v8); Hex8(v8); Hex16(v16);
Dec8(v8); Dec16(v16); Dec9999(v16<9999); *
Big();  BigBin8(); BigHex8(); BigHex16();
BigDec8();  BigDec16(); BigDec9999();
Dot(x,y); DDot(x,y); Vline(x); Hline(y);
```



x, y are global variables already declared.
We can write Dot (10,20); or x = 10; y = 20; Dot (x, y);

```
PosDir (x,y,dx,dy); Ball(x,y); *
Raq (x,y,h); Step(); *
Interaction: variables globales déjà déclarées:
```

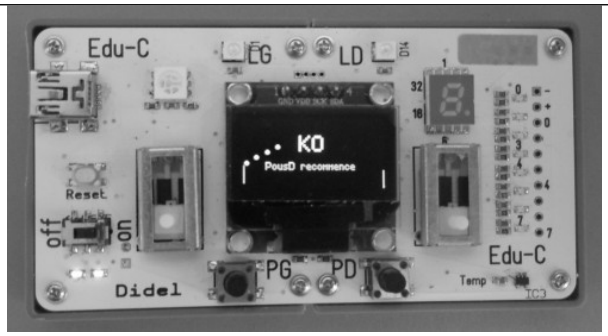
byte x,y,dx,dy,touche,vitRaq

Sample program: the ball bounces on the edges:

```
PosDir (64,32,3,4);  // Pos initiale et direction
while(1) { DelMs(10ms); Step(); // bouge d'un pas
  if (touche==1) dy=-dy;
  if (touche==2) dx=-dx;
  if (touche==4) dy=-dy;
  if (touche==8) dx=-dx;
}
```

LedG pin 4	PousG pin pin 2	Pot gauche Adc6
LedD pin 5	PousD pin pin 3	Pot droite Adc7
Rouge pin 6	Oled SDA pin 18	A1 pin 15 Tell - option LDR
Vert pin 1	Oled SCk pin 19	Port 8 bits et 7-segments
Bleu pin 7	SDA SCK Compatible I2C Wire	Bits 0 – 5 pins 8 à 13
Hp pin 14	Oled 0x3C Tmp100 0x48	Bits 6, 7 pins 16,17

Edu-C is an Arduino compatible board that can also be programmed in Arduino - just know the pin numbers of the leds and push buttons and use the usual Oled I2C library for display. Execution time and code size will increase.



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