

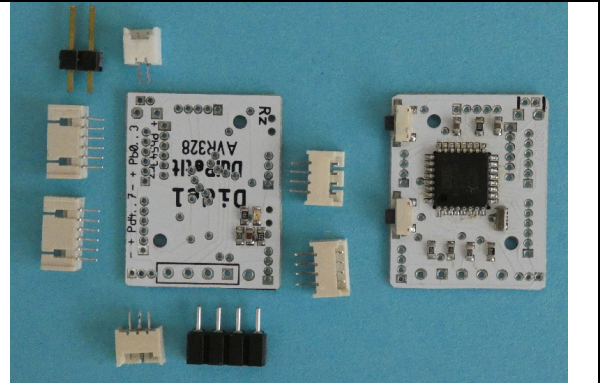


Minos **DuiPetit**

Links to .pdf files are easy to click on <https://www.didel.com/DuiFamily.html>

The Minos board (old name DuiPetit) is similar to the Arduino Mini, but smaller (20x25mm) and not breadboard compatible. All the pins (except pin3/PD3) are available on 1.27mm pitch connectors which include power pins. Molex Picoblade connectors and wire harness makes the connections easy and clean.

Minos king of Kreta, a small island with high culture

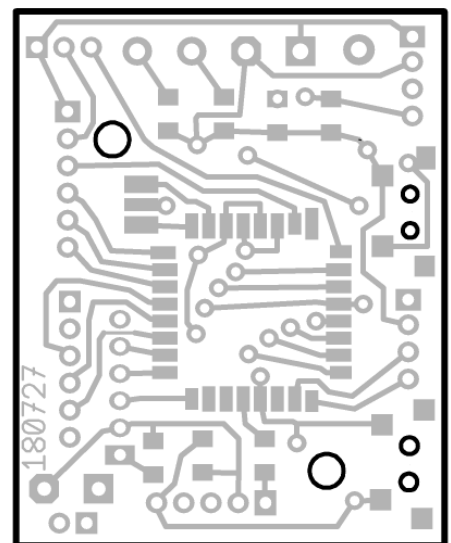
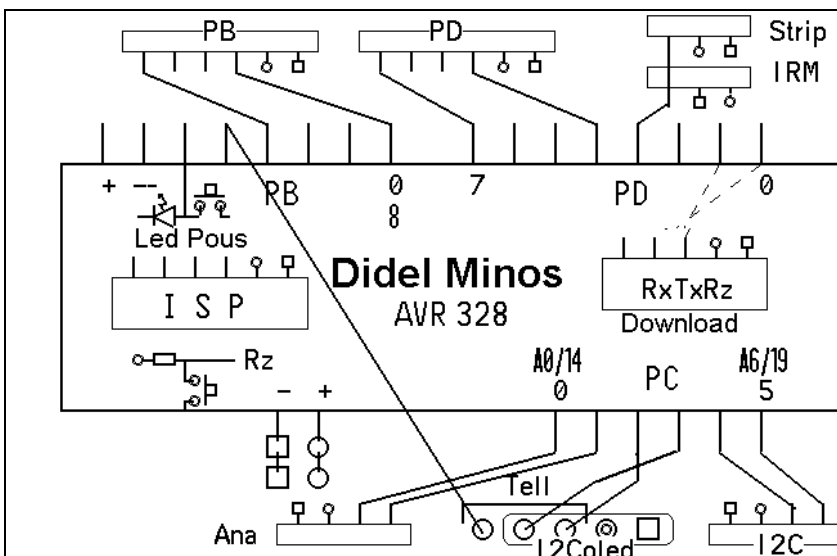
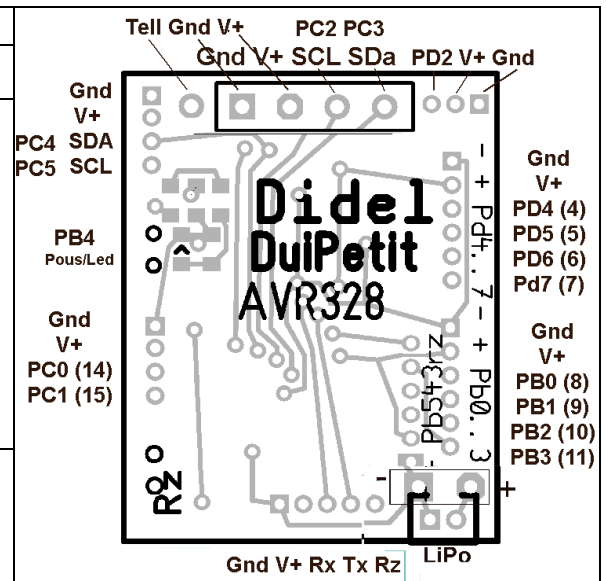


Minos AVR328/Arduino Pins

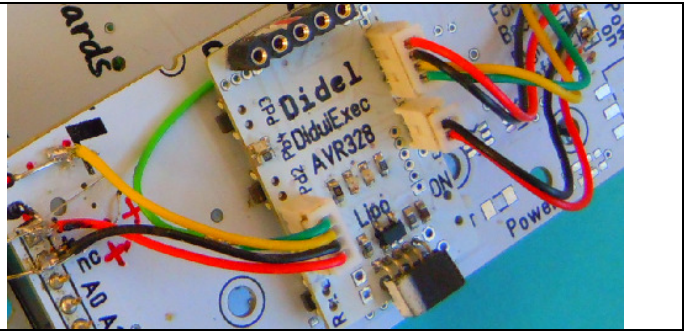
Pin	Port		Pin	Port	
0	PD0	Rx	10	PB2	PbConn
1	PD1	Tx	11	PB3	PbConn
2	PD2	Strip/IRM	12	PB4	Led /Push
3	PD3	nc	13	PB5	Tell
4	PD4	Pdconn	14	PC0	PcConn
5	PD5	Pdconn	15	PC1	PcConn
6	PD6	Pdconn	16	PC2	Oled conn SCL
7	PD7	Pdconn	17	PC3	Oled conn SDA
8	PB0	PbConn	18	PC4	I2C conn SDA
9	PB1	PbConn	19	PC5	I2C conn SCL

ISP program pins can also get a connector; Gnd, V+, PB5, PB4, PB3, RZ

Download pins Gnd V+ Rx Tx RZ have a female 1.27mm strip or only holes for unfrequent reprogramming.



Many application needs a compact board: smart sensor, strip of RGB, all kind of wearables with I2C or other signals. Frequently, a display is welcomed: add a low cost, low power Oled. Add sensors on the I2C connector. Program the module to be an I2C slave for your special application. Do anything you can do with your beloved Arduino board.



Specifications

AVR328 microcontroller 16 MHz, reset push button.

Need a DuiLoad module (CH340 USB) for downloading programs with Arduino IDE.

Push button and Led on pin 12/PB4.

One 4-pin SIL connector for an Oled SSD1306 (bitbang) and one Molex Picoblade 1.25mm pitch I2C connector (TWI compatible).

Four Molex connectors for accessing other I/O pins.

Connectors are not soldered. Solder only the required' one.

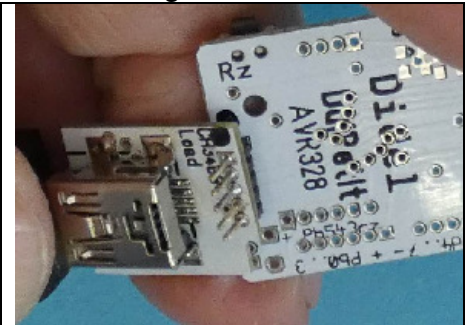
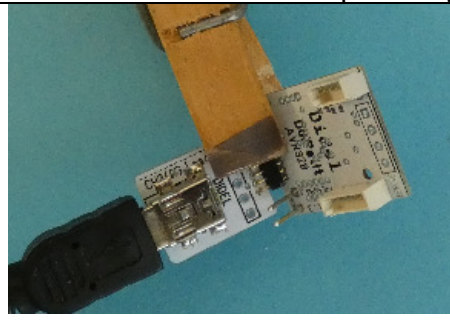
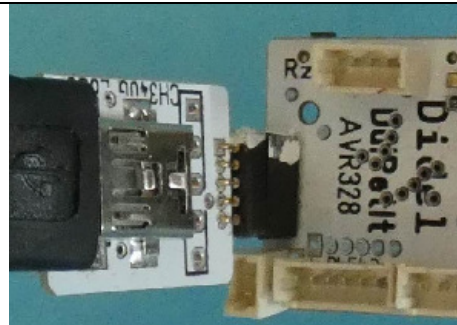
Definition files

The test and demo programs are available on www.didel.com/Minos.zip

Main definition file is Minos.h and include the instructions detailed below. We show also the Arduino way you may be more familiar with, but test programs are in C.

Programming

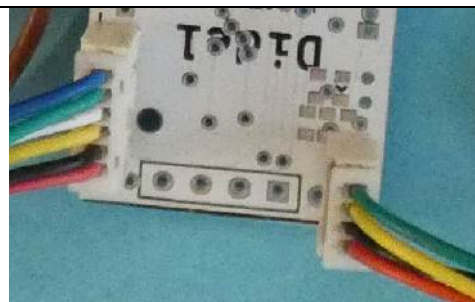
Gaia/Pythie/DuiLoad module has male pins. Insert them in the holes of Minos and bend slightly while data transfer occurs. It works, it is reliable, it is simple. 20 years of usage at Didel.



Wiring and data connectors

All Arduino signals are available, but as on most Arduino applications, there will be only few active signals. Solder Molex connectors where they are required.

If you solder wires directly on the board, do not use solder jumper wires (they will quickly break close to connector). Use monofilament thread 0.3 to 0.4mm or very thin high flexibility isolated wires.

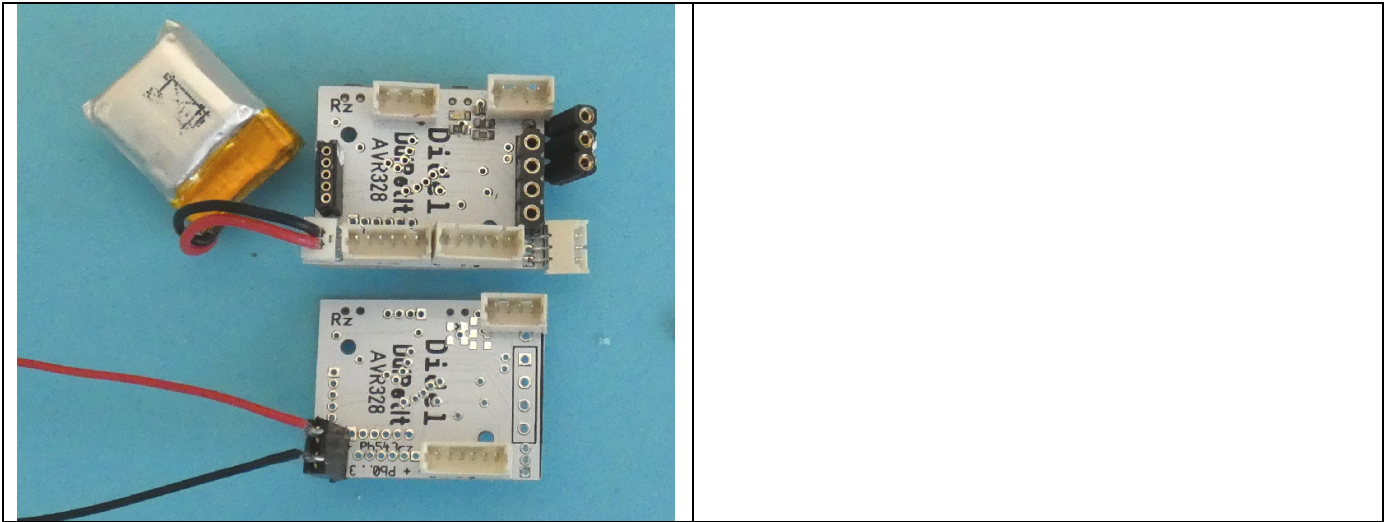


Powering the board

You need a 3 to 5V supply to run the processor and what you have connected around.

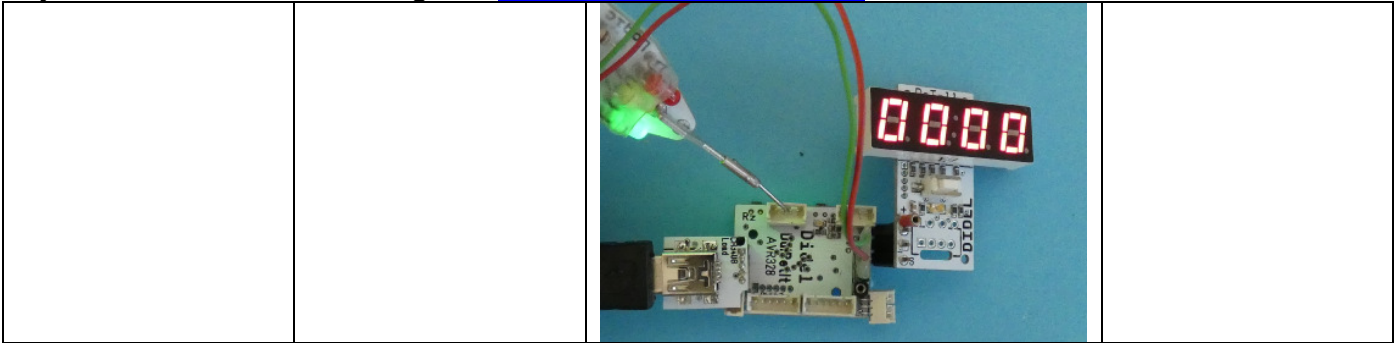
Two connectors, 2.54 and 1.25mm are available. A Molex 2-pin connector is supplied; it is, compatible with several models of minidrone Lipos. Double check the polarity (see the warning next page).

Bahoma connector is a new option on the production board. There are 4 possibilities for positioning the LiPo, that must be defined when inserting elements. See www.didel.com/MinosBahoma.pdf for details



Debugging help

We are used to debug with a logic pen and the Tell display. If you do not use the Oled, the Tell connector share some Oled pins, see later. For the logic probe, you have +/- pins at many places, patch a 0.1" connector at the best place.
If you have to do realtime debug on the Minos, the Rx Tx signals have easy access pins on the Pythie, used for downloading see www.didel.com/Pythie.pdf



Description of the on-board facilities

Led (ignore the push-button).

AVR PORTB bit 4 or Arduino Pin 12

C for AVR328	Arduino
<pre>#define bLed 4 // Port B #define LedOn bitSet (PORTB,bLed) #define LedOff bitClear(PORTB,bLed) void SetupLed { bitSet (DDRB,bLed); }</pre>	<pre>#define Led 12 #define LedOn digitalWrite (Led,HIGH) #define LedOff digitalWrite (Led,LOW) void SetupLed { pinMode (Led,OUTPUT); }</pre>

Pushbutton only

C for AVR328	Arduino
<pre>#define bButton 4 // Port B #define PushOn bitTest (PORTB,bButton) void SetupLed { bitClear (DDRB,bButton); }</pre>	<pre>#define Button 12 #define PushOn digitalRead (Button) void SetupLed { pinMode (Button,INPUT); }</pre>

Led and Pushbutton

AVR PORTB bit 4 or Arduino Pin 12.

By default, the pin is in Led mode (output). Depressing the switch in this mode light the Led (with a different intensity due to the protecting resistor).

In order to read the switch, one need to set the pin as input. A macro is doing the job. LedOn or LedOff activate the output.

C	<pre>#define bLP 5 // LED/Push bit on PORTB #define PushMode bitSet (DDRB,bLP); DelMs(1)</pre>
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	<pre> #define PushOn PINB&(1<<bLP) #define LedMode bitClear (DDRB,bLP) #define LedOn LedMode; bitSet (PORTB,bLP) #define LedOff LedMode; bitClear(PORTB,bLP) void SetupLed { bitSet (DDRB,bLed); } </pre>
Arduino	<pre> #define LP 12 // LED/Push pin #define PushMode pinMode (LP,INPUT); delay(1) #define PushOn PushMode; digitalRead(LP); #define LedMode pinMode (LP,OUTPUT) #define LedOn LedMode; digitalWrite (LP,HIGH) #define LedOff LedMode; digitalWrite (LP,LOW) void SetupLed { pinMode (Led,OUTPUT); } </pre>

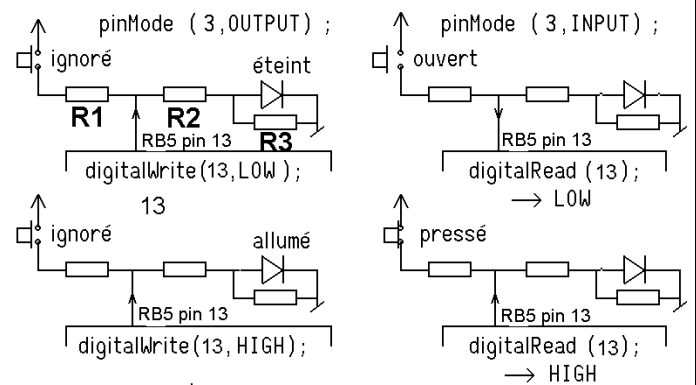
Let us explain the schematic.

R1 limit the current if the switch is pressed when pin12 is LOW

R2 sets the current for the Led if pin12 is high.

R3 is a high value resistor that improves the zero level when pin 12 is floating.

More on www.didel.com/diduino/PushButton.pdf

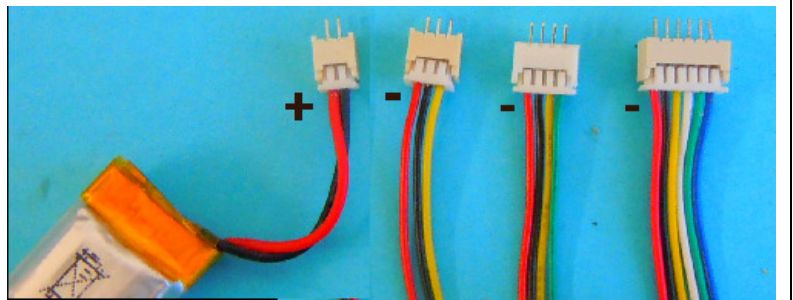


Warning : Molex cable harness

Pin 1 in most designs is Gnd and we apply that rule with inevitable exceptions. Molex has a red wire on pin 1 and black on pin 2. This is not what we would have liked.

The worse is Lipos refer to the color, pin1 is +, pin2 is -. We have to follow that anomaly. Be carefull.

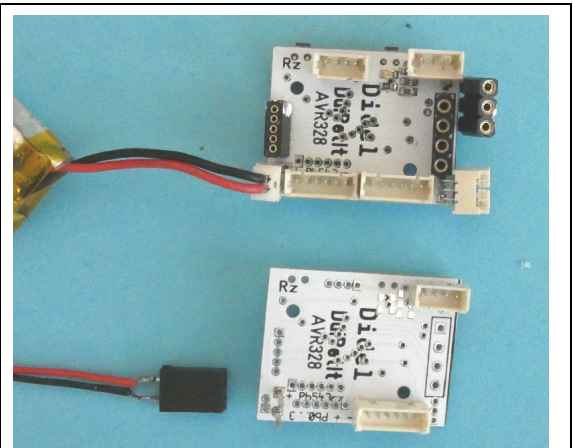
Our other exception is the Tell connector.



Power connector

In addition to the Bahoma contacts, if used, two connectors are the board. Use either the 1.25mm or 2.54mm pitch connector. There is no switch, with the idea that the application will be on for a rather long time, and when it is finished or the battery is flat, the Lipo have anyway to be removed to be connected to the charger.

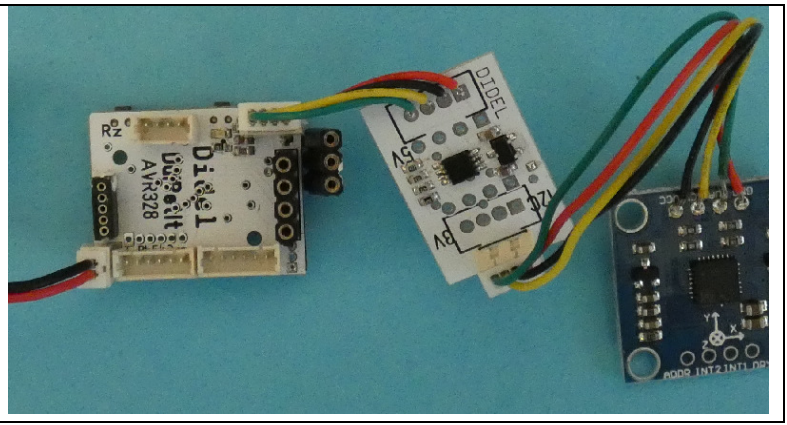
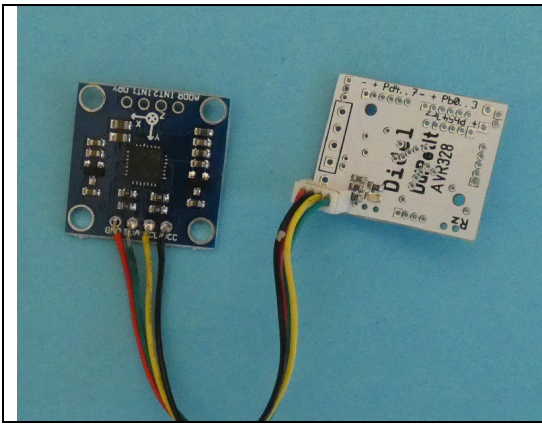
Bahoma is of course the solution for quick connect and remove the Lipo.



I2C connector

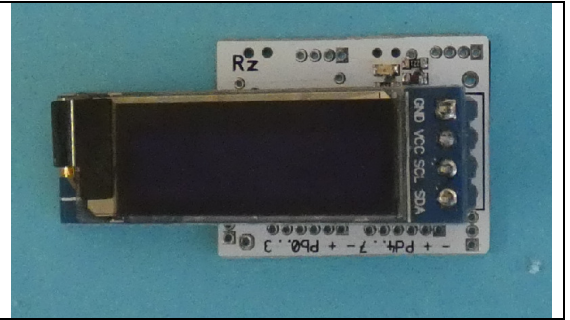
A 4-pin Molex connector is provided to attach any I2C sensor or display. Just check the pinout and the voltage for your sensor, use a 5/3V adapter if required.

Pins are the usual I2C pins, Arduino Wire library can be used but we prefer our compact and more easy to use our I2Ctwi.h library. See www.didel.com/I2Ctwi.pdf



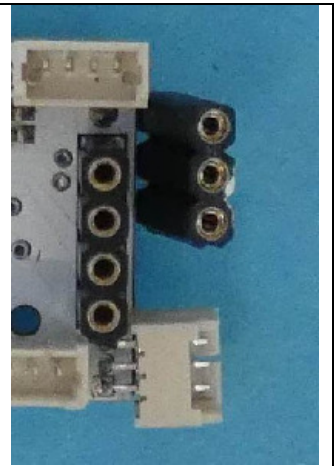
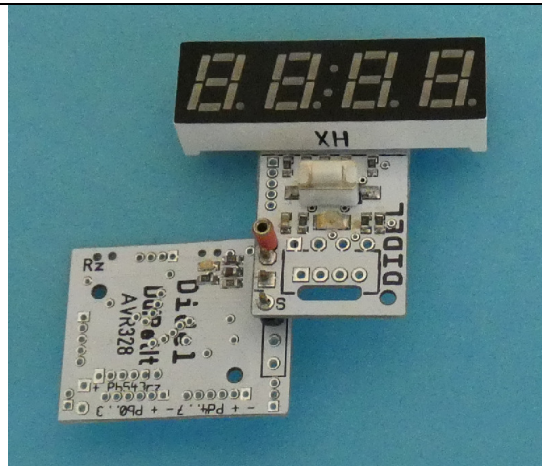
I2C special connector for SSD1306

The Oled SSD 1306, 32x128 or 64x128 are so cheap and so easy to use, why do without it ? It is connected on pins 16,17 (PC2,PC3). We use it with a compact bit-bang write only functions that separate the I2C transfer on pins PC2 and PC3 (I2Cbb23.h) and the no buffer text, numbers and graphic routines (OledPix.h). See <https://www.didel.com/Oled.html> for details.



Tell connector

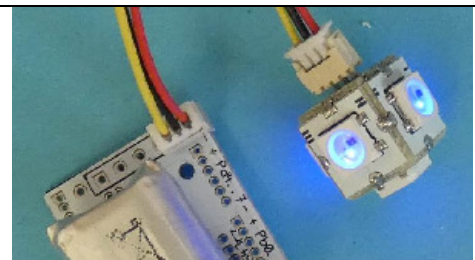
Tell display is very convenient while testing sensors, monitoring a switch-case sequence, etc. The connector share the Oled connector and use Arduino pin 13 (RB5). See <https://www.didel.com/prof/Tell.html> for links.



3-pin connector on PD2

The 3-pin connector can be used for controlling RGB strips (wearable applications). Our doc on strips and cube: <https://www.didel.com/affichages/rgb-strips/>

PD2 accept hardware interrupts.



4-pin connector on PC0 and PC1

This connector can receive analogue channels A0 A1. These 2 pins are also general purpose.

