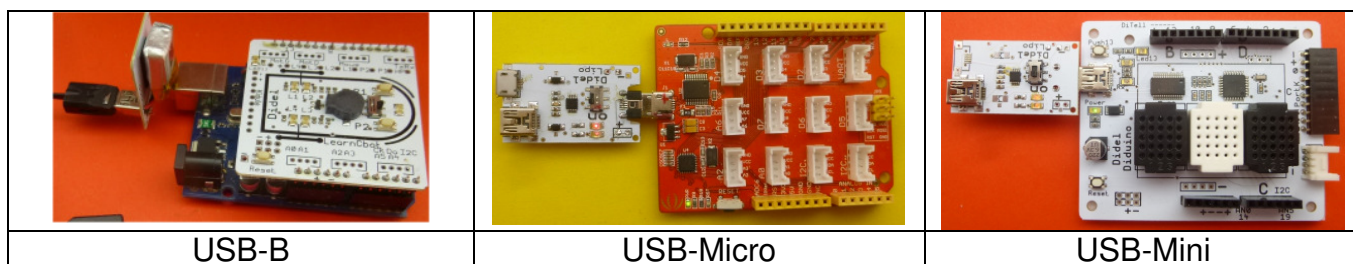
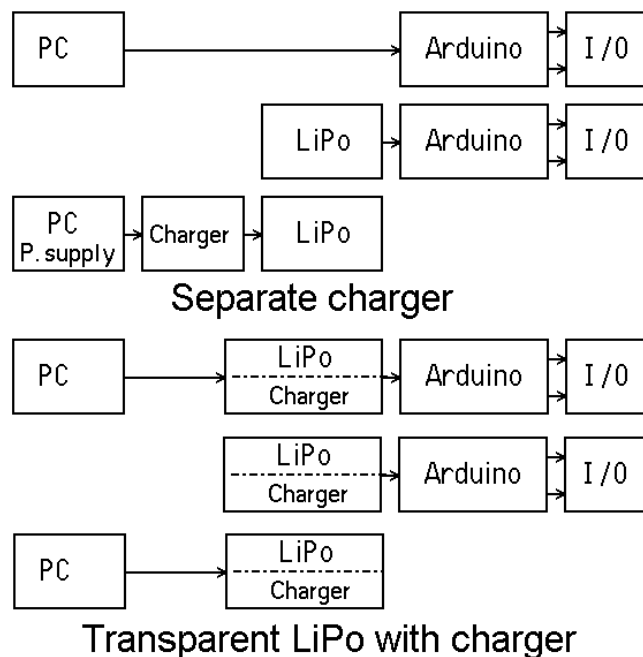


LiPo Modules for Arduino



You develop an autonomous application?
 You have to unplug the USB connection and connect a LiPo or battery to test autonomy. From time to time you have to connect the Lipo to a charger connected to some power supply.

With the transparent LiPo modules, the module stay connected to the Arduino or other microcontroller. Just disconnect from the PC for autonomous applications. Reconnect to modify the program and the LiPo recharge.



USB options

Mini-B USB plug, is always used on the LiPo modules.. On the user's side, there are three possible plugs for the moment, and all these plugs are used on Arduino boards. Mini-B is small and reliable. We use it on charger side.



Didel LiPo modules

We are concerned only about low power and 3 to 5V applications.

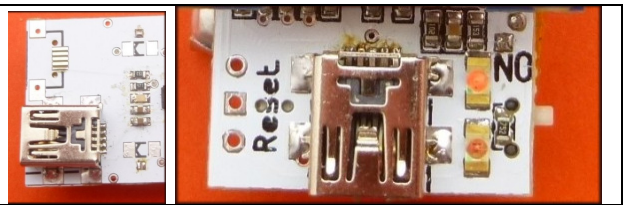
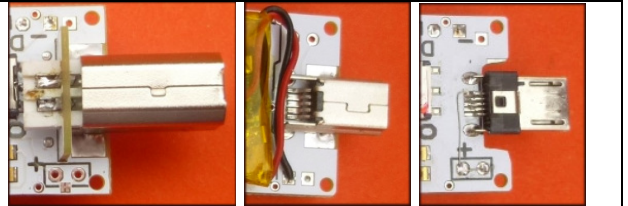
The trend is to have 3.3V sensors, compatible with 5V input signals, or easy to make compatible with few components. 3.3V power is made with an LDO.

All 5V processors run at 3V or less (AVR328 too, but it can be programmed with a Brown-out reset at 4.3V).

Hence, a simple LiPo is the solution for most applications, and we recommend the use of small capacity LiPos during the development. Below a 500 mAh capacity, there is no fire risk from a short or during charge.

As standard, LiPo capacity is 250mA (28x20x5mm). Charger current is 100 mA when the LiPo is discharged. A LED indicates the charge. The LiPo can be replaced by any LiPo 3.7V.

Charging time will depends on the capacity.

Charge connector (female): 2 options USB-mini on all boards USB-micro on several boards, when space was available	
Arduino power connector (male): USB-B for Arduino-Uno USM-Mini for Diduino, Nano V3, Freeduino, etc USM-Micro for Leonardo, Seeeduino, Uno-R3, etc	

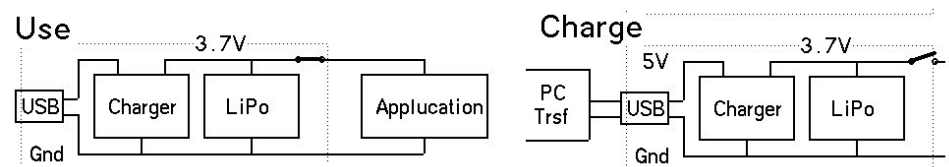
Uno users ! You surely will be pleased to get rid of the USB-B cables and use a Mini-B Roll Cable

Transparent mode

With transparent mode, the LiPo modules stay connected in front of the Arduino compatible USB signals go through the module and if the PC is powered, the LiPo is under charge.

Simple mode

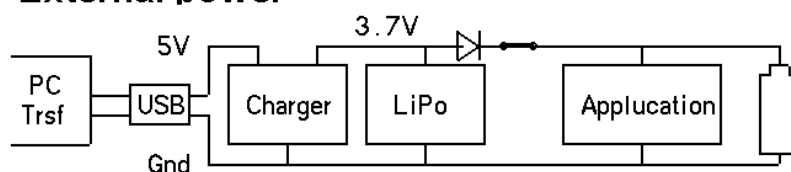
The LiPo module is used as a battery and should not be connected to a powered device. . It is not dangerous to charge while powering the application.



Either the LiPo is charged, or the LiPo module power the Arduino board.

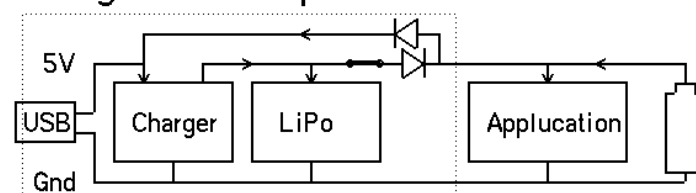
But if the application is powered with any voltage, a diode is required to protect the Lipo. Another diode should protect the power source, if the voltage is lower than 3.7V.

External power



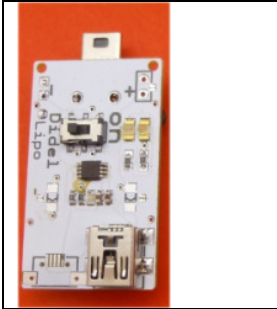
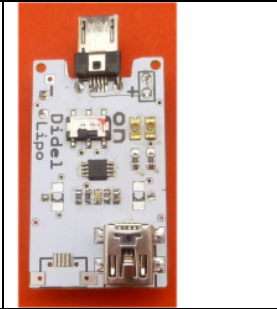


A last situation is to use the power from the application, if greater to 5V, to charge the LiPo. this mode is used in the transparent modes.

Charge while powered



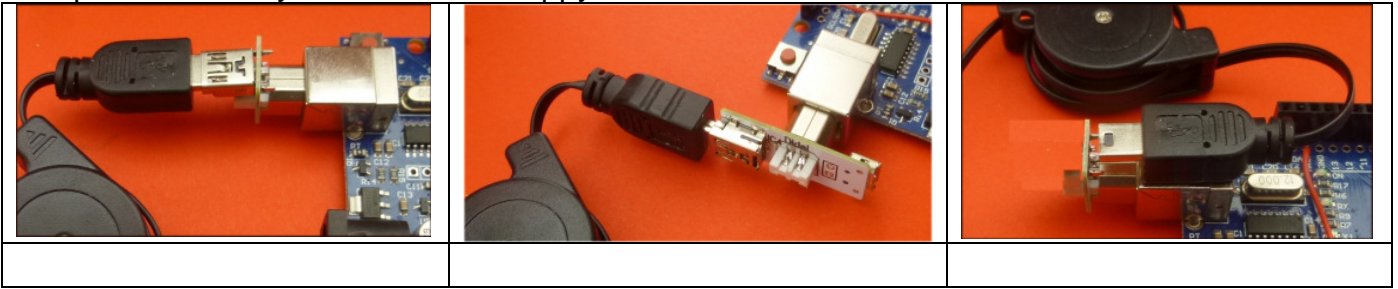
Note: Diodes are not systematically used, because they induce a voltage drop of 0.4 to 0.6V, that is 20% of the 3.7V voltage they protect.

Catalogues

Mini	Micro	Uno-C	Uno-V	Uno-H
		En développement		
Next model transp.	Simple	Transparent	Transparent	Simple

See the documentation of the specific modules you are interested in.
www.didel.com/LiPo{Mini,Micro,Uno-C,Uno-V,Uno-H}.pdf

Adapters to make your Uno board happy with flexible wires



LiPo modules special features

Charging is made with a 100mA current. A yellow LED is ON while charging. Charge stops when the charging circuit detects a voltage of 4.2V. Measured voltage on a 50mA load (typical Arduino board) is 3.8V and stay around 3.7V for 3+ hours (250mAh lipo capacity).

Charge indicator

Two LEDs provides an easy voltage indication. At 3.2V, the second led is Off (explanations on www.didel.com/microdules/TesteursEle.pdf)

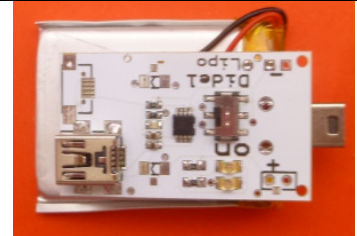
Experience with different Arduino 5V boards and usual sensors have shown compatibility at 3.7V, except few cases with SR05 (specified at 4.5V).

We have no experience with 3.3V Arduino powered at 3.8V. We recommend to use a LDO

Options

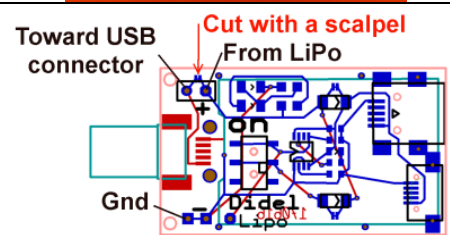
Larger or smaller Lipo?

There is a big choice for replacement LiPo for toys. Be sure there is a voltage and current protection on the LiPo. Do not make a short cutting and stripping the LoPo wires. Solder the 2 LiPo wires (square pin is Gnd). Charging time will depend on the capacity. A trickle charge occurs when the battery is full.



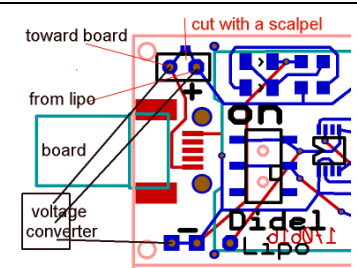
Options 3.3 and 5V add-on

If you need a different output voltage, you can design a clean piggy-back module. Three pads are available to connect a LDO or a DC-DC converter.



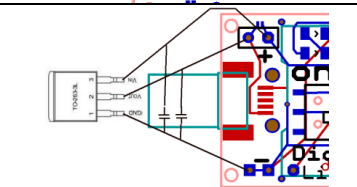
3.3V output

This is the easy way to add a low dropout regulator.



5V output

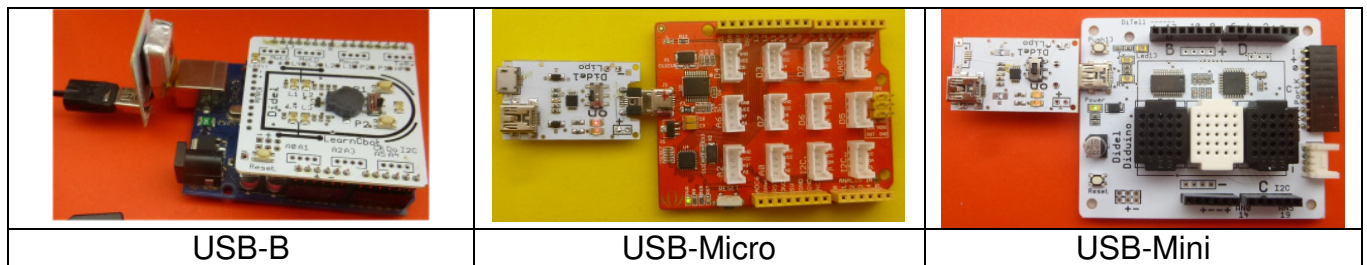
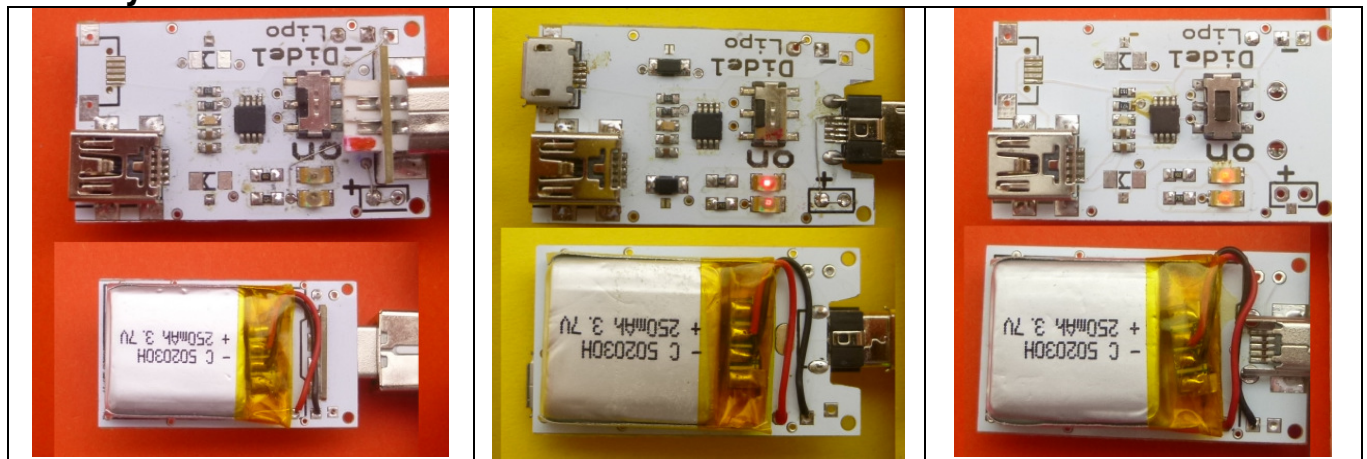
On the same 3 pins, after cutting the bridge, you can add a 5V booster.



Many cheap voltage booster are available. We do not recommend the ones below, they have not been tested. Just found on the net as examples.



Gallery

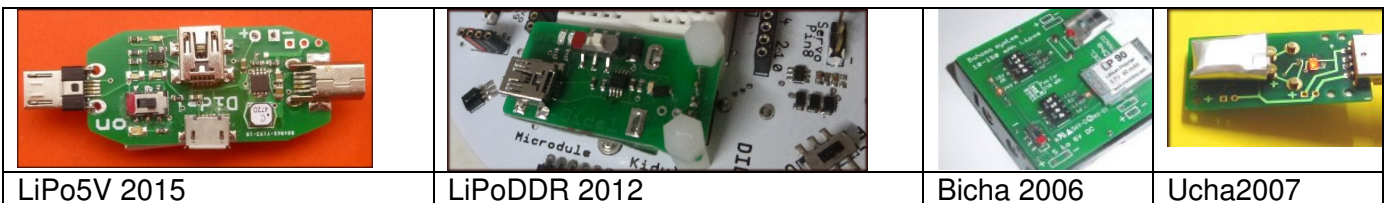


USB-B

USB-Micro

USB-Mini

jdn 170711

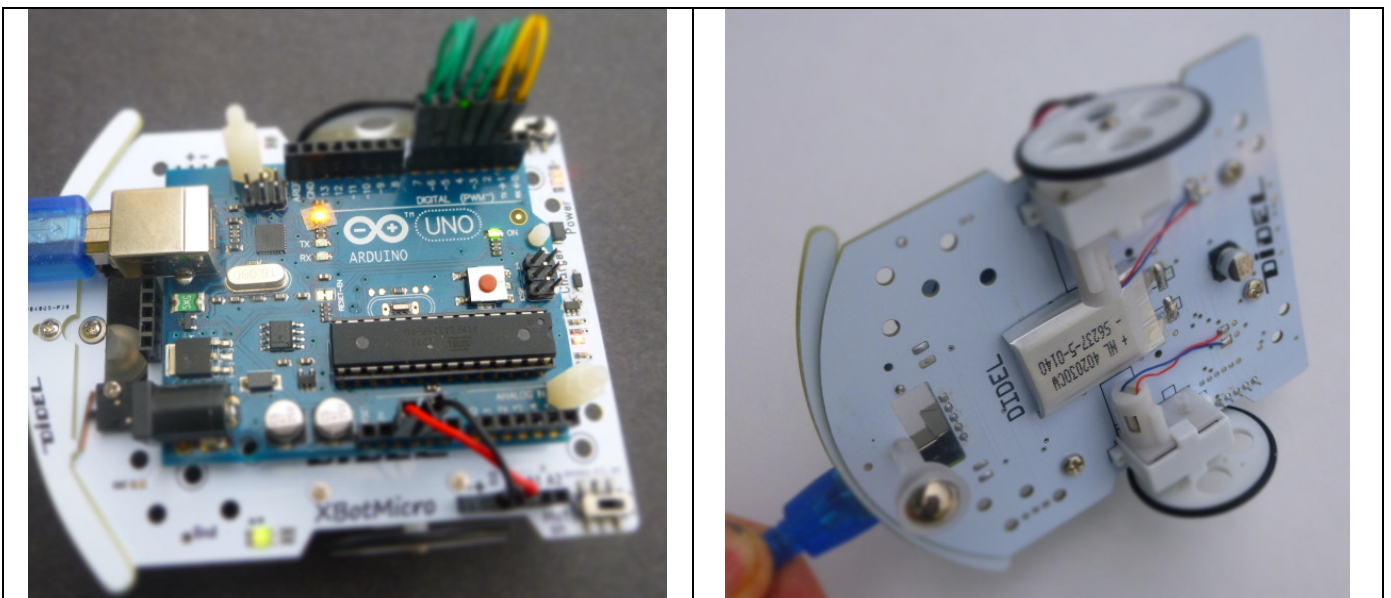


LiPo5V 2015

LiPoDDR 2012

Bicha 2006

Ucha2007



The Xbot robot benefits from a similar LiPo modules. The LiPo is part of the base and powers the Arduino when the USB is connected while you program the next demo. So, the LiPo is always charged when you test on the field .

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