

FLORA - Wearable electronic platform: Arduino-compatible - ID: 659

For the last few years Ladyada has been thinking about everything she wanted in a wearable electronics platform for Adafruit's community of makers, hackers, crafters, artists, designers and engineers. After months of planning, designing and working with partners around the world for the best materials and accessories, we can share what we're up to. The hardware is now shipping! We call it the **FLORA**.

Adafruit created the FLORA from scratch after many months of research and we really think we came up with something that will empower some amazing wearable projects.

The FLORA is small (1.75" diameter). We wanted the smallest possible board for our wearable platform.

It's based on our experiences shipping our own, shipping, customer-tested [Atmega32u4 Breakout Board](#).

The FLORA comes with projects at launch, the FLORA addressable and chain-able 4,000 mcd RGB LED pixels, ultimate GPS module, premium stainless steel thread.

The FLORA has built-in USB support. Built in USB means you plug it in to program it, it just shows up - all you need is a USB cable, no additional purchases are needed! Works with Mac, Windows, Linux, any USB cable works great. Currently the PCB comes with a mini B connector but future versions may change to microUSB. The FLORA has USB HID support, so it can act like a mouse, keyboard, MIDI, etc. to attach directly to cellphones.

The FLORA has a small but easy to use onboard reset button to reboot the system. The power supply is designed to be flexible and easy to use. There is an onboard polarized 2 JST battery connector with protection schottky diode for use with external battery packs from 3.5v to 16v DC in. Can be used with Lilon/LiPoly, LiFe, alkaline or rechargeable NiMh/NiCad batteries of any size. The FLORA does **not** have a LiPo charger included by design, this allows safe use with multiple battery types and reduces risk of fire as it is not recommended to charge these batteries on fabric.

The FLORA has onboard power switch connected to 2A power FET for safe and efficient battery on/off control. Often FETs are not included in other designs that leads to switch failure as small SMT switches are rated for only 20mA current use. The FLORA has an onboard 3.3v 100mA regulator with protection diode and USB fuse so that power is consistent and can power common 3.3v modules and sensors.

We spent a lot of time on the power supply because the FLORA power system is specifically designed to allow easy control and power of a large quantity of digital RGB LED pixels such as the FLORA pixel series of accessories.

The FLORA is fabric friendly. The FLORA does not use FTDI headers (built in USB support) headers of any kind sticking out can grab and tear fabric.

The FLORA is extremely beginner-friendly - it is difficult to destroy the FLORA by connecting a battery backwards due to polarized connector and protection diodes. The onboard regulator means that even connecting a 9V battery will not result in damage or tears.

The FLORA has 4 indicator LEDs: power good, digital signal LED for bootloader feedback, data rx/tx. Also onboard is an ICSP connector for easy reprogramming for advanced users.

There are 14 sewing tap pads for attachment and electrical connections. Data buses are interleaved with power and ground pads for easy module and sensor attachments without worrying about overlapping traces which are not possible with conductive thread.

The FLORA works with the Adafruit-fixed Leonardo-like bootloader and will work with any future released Leonardo-compatible bootloader. FLORA is currently using our bootloader and Adafruit USB vendor ID.

The FLORA comes with Adafruit's support, [tutorials and projects](#). Adafruit has dozens of projects that will be released with the FLORA in 2013 and has staff 100% dedicated to creating tutorials and projects for use with the FLORA.

The FLORA is not the first wearable Arduino / Arduino-compatible. Leah Buechley's [Lilypad](#) was developed in 2007 – we wanted to also make something that's wearable, but it needed to be a completely new platform for our accessories/modules and goals for the project.

The FLORA is made in NYC at Adafruit, it was designed by Limor Fried (Ladyada) she is an Electrical Engineer with a proven track record of providing over 26 high-quality libraries for Arduino/Arduino IDE, over 100 tutorials, open-source code and contributions to the Arduino project. She was a member of the MIT wearables group and likes to sew.

