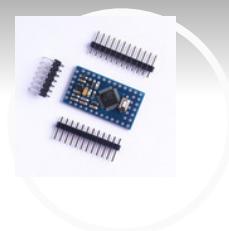




Search ivoras-electronics



Follow ivoras-electronics

tumblr

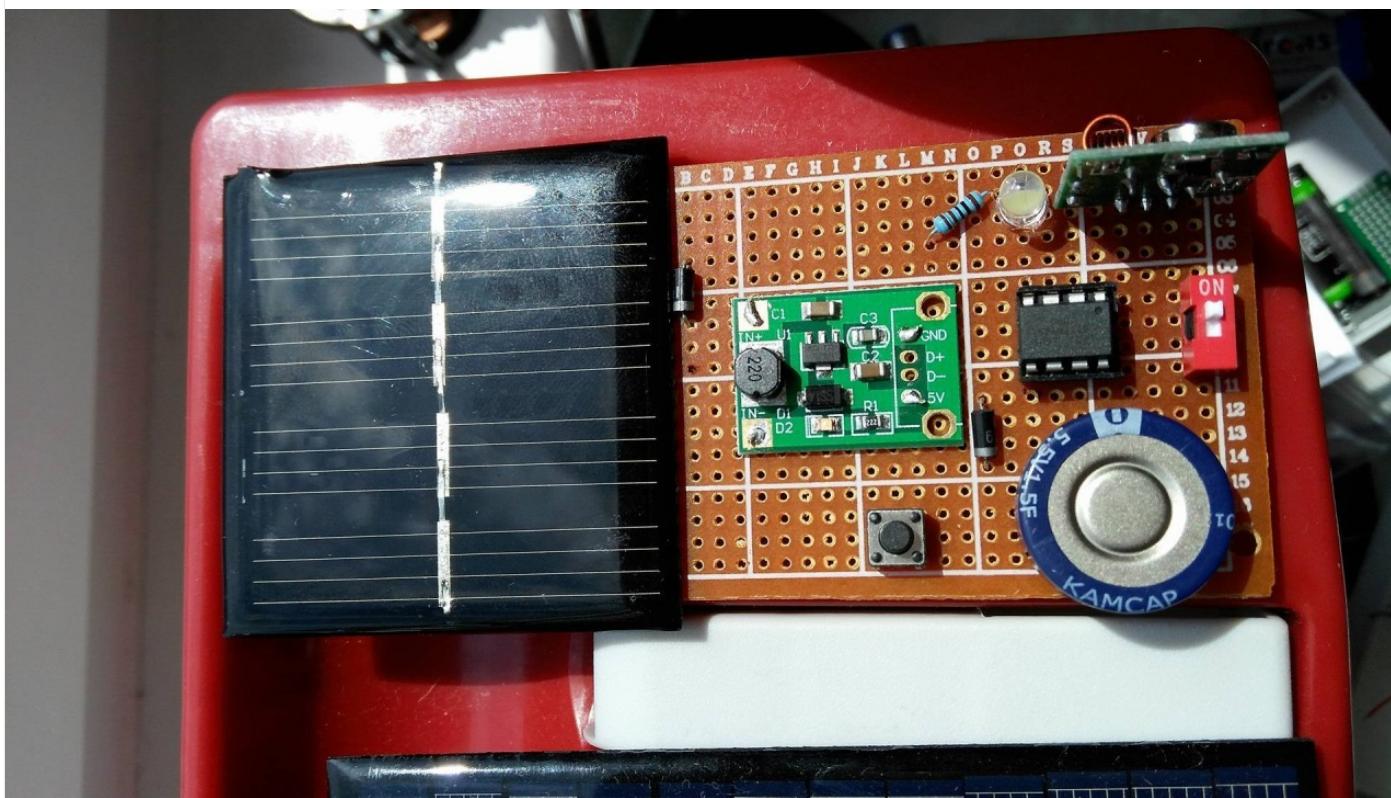
ivoras' electronics stuff

Adventures in electronics

ARCHIVE

My Tiny Solar Sensor Platform

As an evolution of my [previous projects](#), I've changed and simplified the design of my supercapacitor-powered 24h sensor with ATtiny85, and made a better-looking circuit on a proto-board instead of using breadboards.

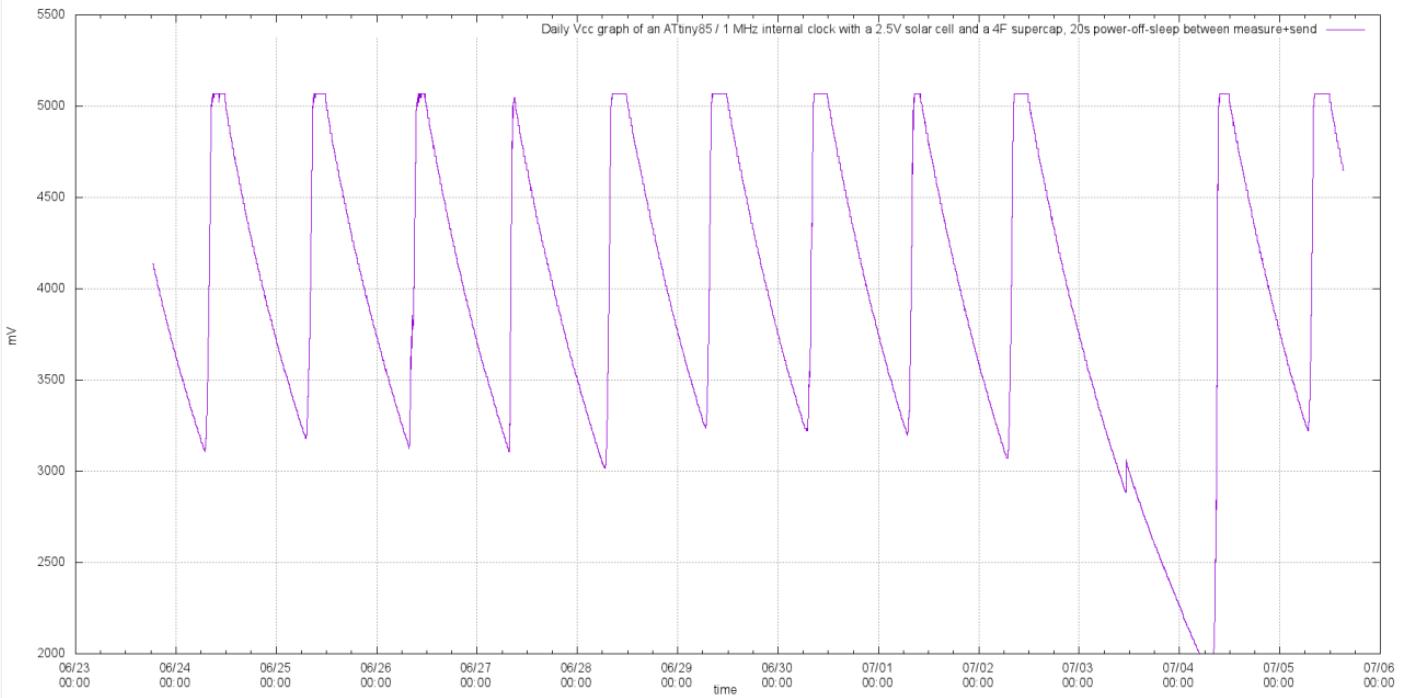


The above picture is from a slightly older iteration, using a 1.5 F 5V supercap, which I've since replaced with a 4 F one.

This design has the 2.5 V solar cell feeding a 5 V booster module through a Schottky diode, which then charges the supercap, to which the ATtiny85 is directly connected.

As before, the MCU sleeps for a period of time (currently 20 s) then measures its input voltage, directly powers the 433 MHz module from one of its IO pins (rated up to 40 mA), and sends the measurement to a standalone receiver a couple of meters away. I've also added internal MCU temperature measurement, which has proven to be uselessly inaccurate. I've tried using a DHT-11 sensor module but something went wrong - possibly because the module is faulty. I'll investigate it later.

With this setup, when the device is near my window, which gets direct sunlight only until about noon, the whole thing manages to operate for about a day and a half on a single full charge, as shown here:



The MCU voltage graph plotted on the receiver side shows that the voltage never drops below 3 V if the days are sunny enough to have the capacitor fully charged. On the high side, it's capped to 5V from the boost converter. The values have a bit of a positive DC bias because I didn't calibrate the chip for the variations in its internal voltage reference.

On the 4th, it was a cloudy and stormy day; so the solar panel couldn't provide enough power to charge the supercap, so the voltage continued to drop. I've programmed a cutoff at 2 V at which the MCU basically only sleeps until it gets enough juice. This is why I say this setup can run about a day and a half with a full charge on the supercap. Of course, it would run for a shorter time (hopefully still more than 24h) with a sensor which draws current for itself.

#electronics #solar #attiny85 #supercapacitor

Jul 5th, 2016

MORE YOU MIGHT LIKE

How to start with electronics on a tight budget 1: introduction

I'd like to summarise what I've been

Notes on powering things from supercapacitors

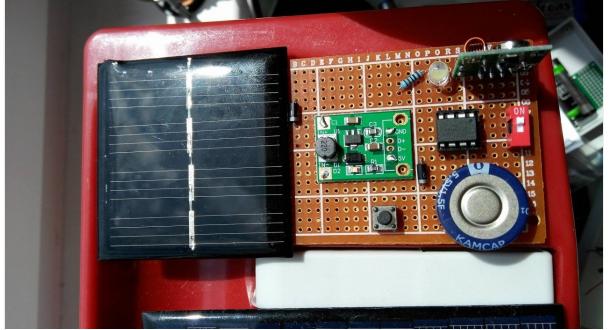
Supercapacitors mostly come in low voltages, usually 2.7V or 2.5V, which limits what can be done with a single

First steps with the RCWL 0516 radar sensor / switch

The RCWL-0516 module can be bought for around \$2 at numerous online retailers on eBay and

doing the past year or so, what I've learned and where I'm going from here. I've always been a software guy - even in university I've mostly avoided anything to do with hardware, and while I've quite the broad experience in software and IT, I've had next to no experience in hardware until about two years go. I've messed around a bit with Arduino and Raspberry Pis, but those were very simple projects, nothing complicated. I've gotten a bit fed up with working with "intangible" software and started seeking what I can do and learn in hardware. I'm writing this to illustrate that, basically, until about a year and a half ago I haven't soldered anything useful, and that, though I remember some fundamentals from the uni, I never had neither the education, nor the experience nor any interest in electronics. Of course, working with software, sometimes even at a very low-level (I was once a kernel developer for FreeBSD) helped much, but not nearly enough.

This was the first thing I made on a proto-board that worked, and required some design and soldering, and I was very much pleased and proud about it (one of the early blog posts at this blog talks about it - it is a supercapacitor-powered solar sensor):



[Keep reading](#)

#electronics #eda #hardware
#starting

1 note

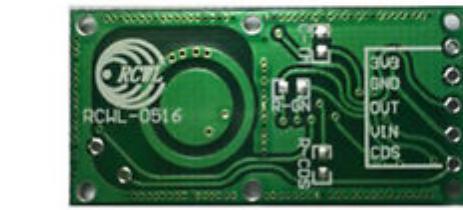
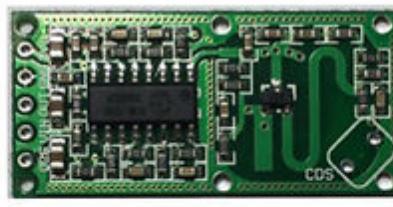
Show more

supercap. Here are some notes from my experiences using them to power small electronic devices.



[Keep reading](#)

Aliexpress, as well as others. It's intended for lamps and wall lights, where it can turn them on when motion is detected, and turn them off after a short timeout. Short-range (~5m) radar modules such as this one are an alternative to PIR (passive infra-red) modules. Despite it being a very widespread and cheap module, documentation is scarce.



[Keep reading](#)