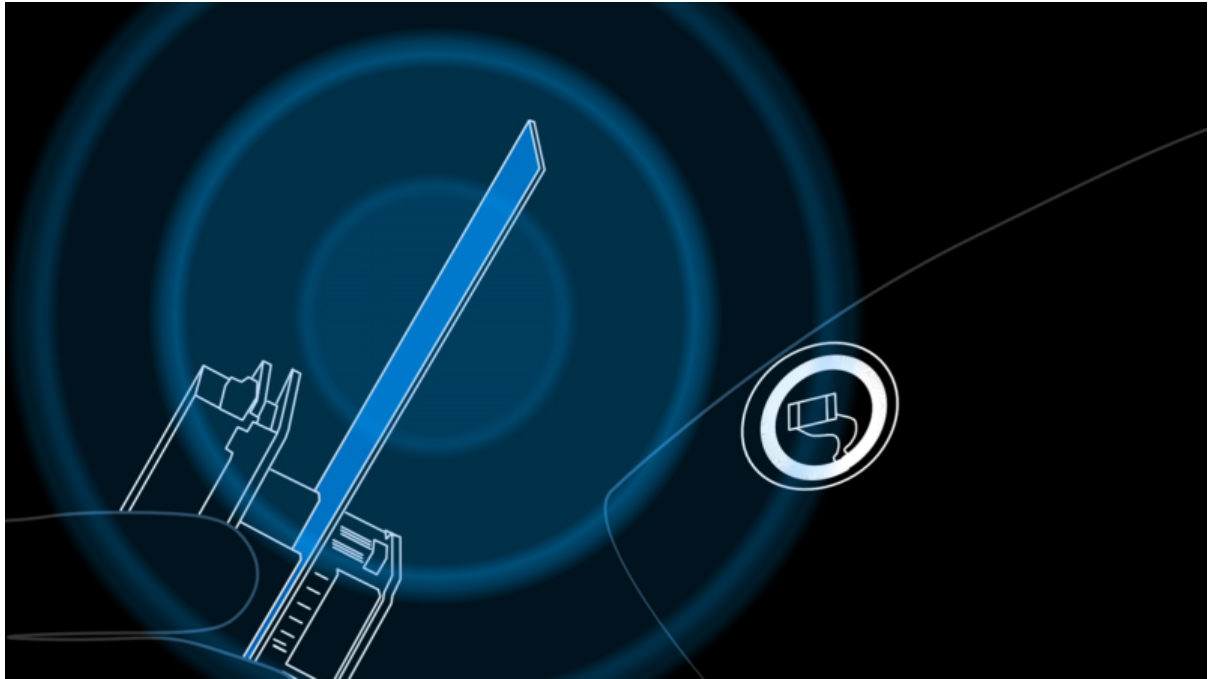




Collin's Lab: RFID

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<https://learn.adafruit.com/collins-lab-rfid>

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Video

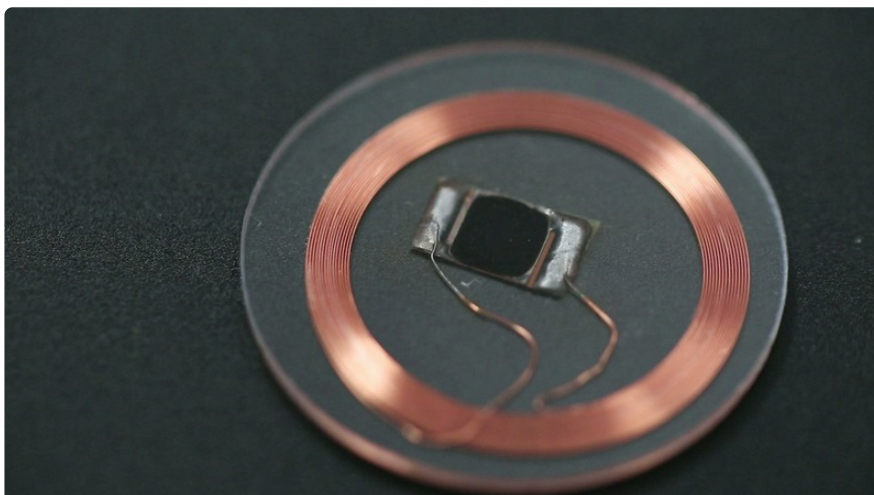
Tiny tags that send & store data, powered by radio waves and small enough to be embedded under the skin – RFID is used all over, but it remains a fascinating technology.

Transcript



Radio Frequency Identification is a method for identifying a tagged object wirelessly using radio waves.

Sounds simple enough - but let's take a closer look at an example, shall we?

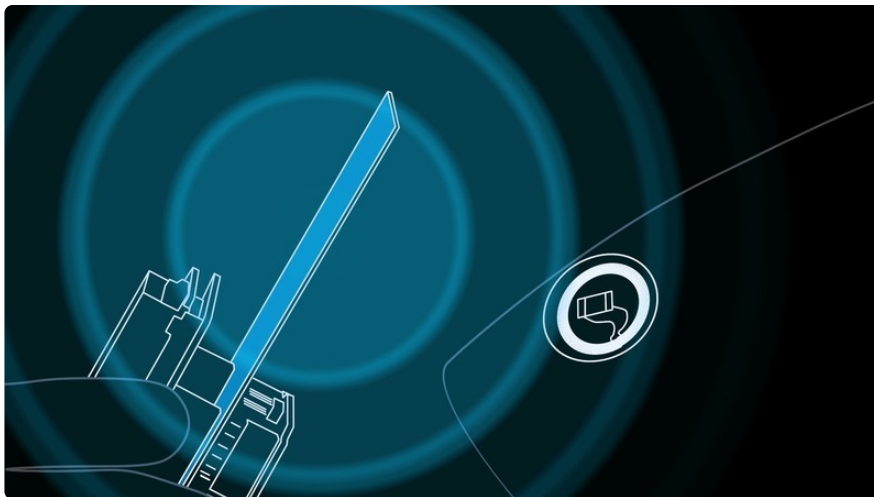


An RFID “tag” consists of a tiny chip connected to an antenna.

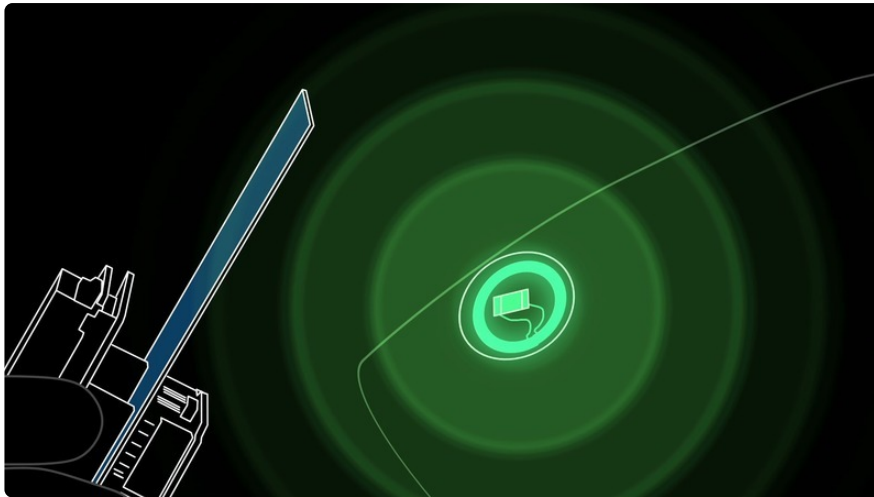


The tag is attached to an object, like say - this lamp here.

An RFID reader placed in close proximity to the tag, generates an electromagnetic field which causes electrons to move through the tag's antenna and subsequently power the chip.

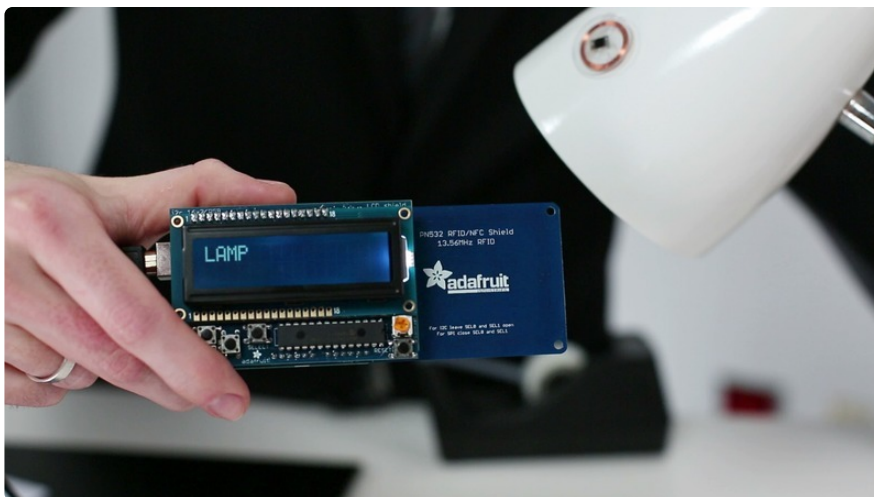


That's right, there's no battery in this tag - it's powered wirelessly by radio waves emitted from the reader ... which is a rather slick move if you ask me.



The powered chip inside the tag then responds by sending its stored data back to the reader in the form of another radio signal.

That radio signal is interpreted by the reader which then sends the data out to a computer or microcontroller.



So reading our tagged lamp here informs us that ... "LAMP".

... yes, I can confirm that this ... is a lamp. True.

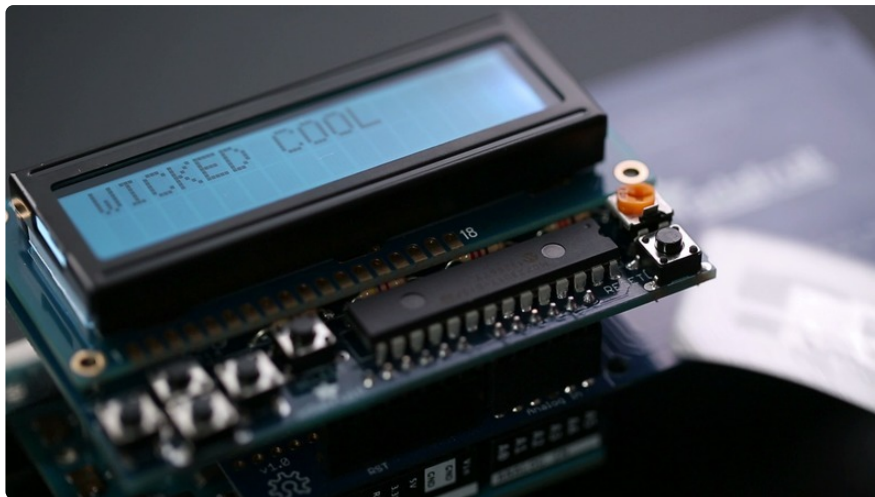


Of course, that's just an example. The data stored in the lamp's tag could have been a price or serial number, or some sort secret message ... which would've been pretty cool in hindsight.

Now there are "active tags" which are self powered via a battery and capable of sending data over a greater distance - but they can get relatively large and cumbersome.

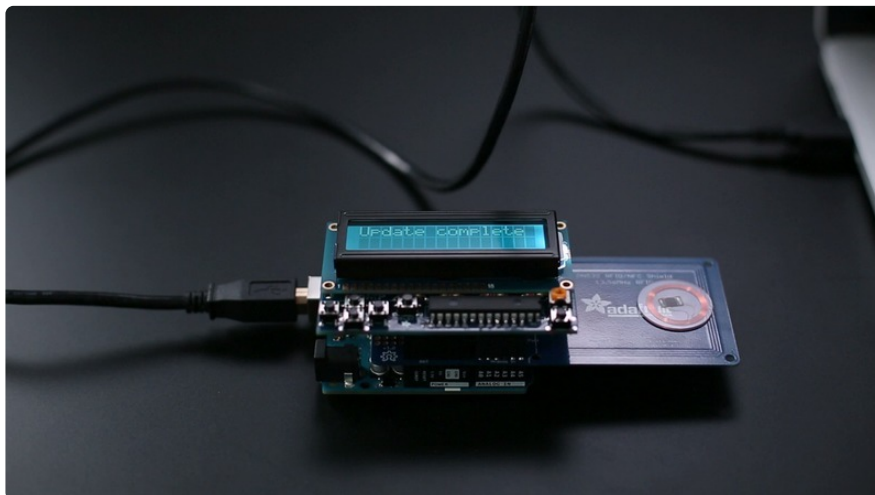


All the tags I'm using here are know as "passive tags" as they have no power source of its own. The benefit of passive tags is that they can be made very, very small. Some even small enough to be embedded under the skin or simply compact enough to be embedded in a label ...



... which is ... "WICKED COOL" ... I suppose that is true.

uhh - who programmed these tags?



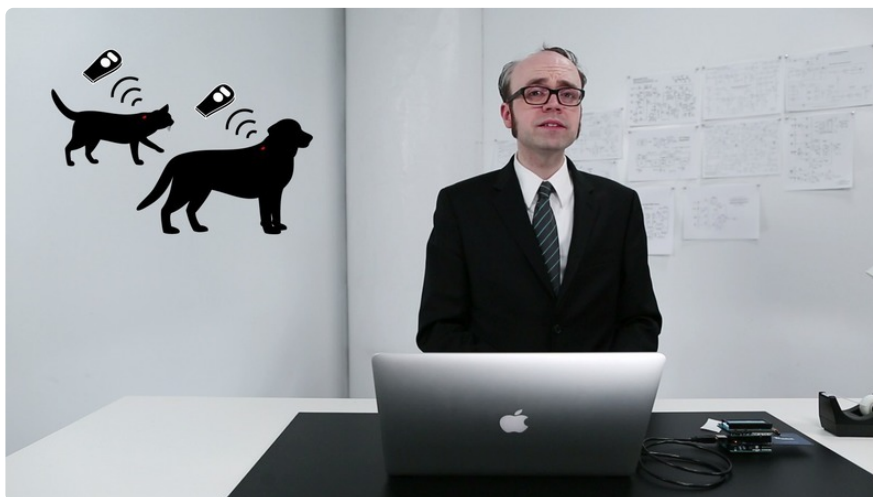
That reminds me - some RFID tags are read-only but as you may have noticed, the tags I'm using here are customizable.

I can write data to their internal memory just as easily as I can read it.



RFID technology is used in a variety of ways nowadays.

It allows us to pay a toll from our cars without stopping.



Open a locked door with a simple swipe.

Or even be reunited with a lost pet.

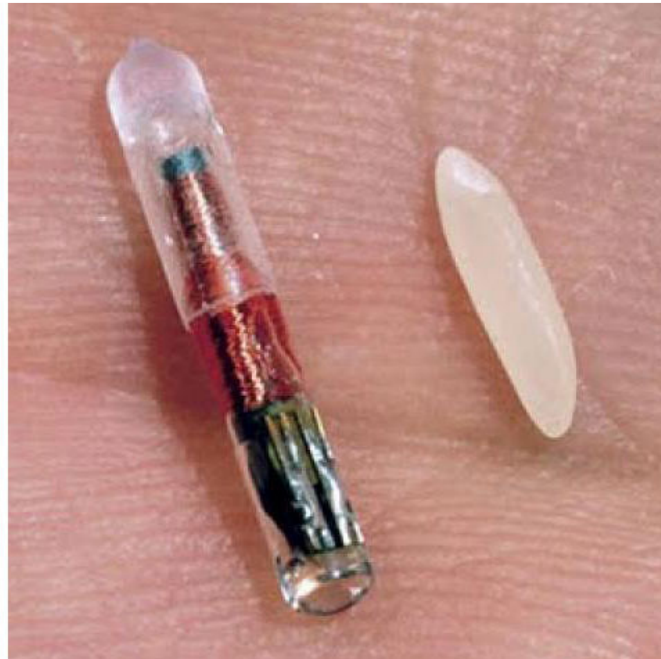


The possibilities of what you can do with it are numerous.

You could even make your own ... “COOKIES”

Guys - that one didn't even make sense!

Learn More



Definition

from Wikipedia (<https://adafru.it/dxz>)

Radio-frequency identification (RFID) is the wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain electronically stored information. Some tags are powered by and read at short ranges (a few meters) via magnetic fields (electromagnetic induction). Others use a local power source such as a battery, or else have no battery but collect energy from the interrogating EM field, and then act as a passive transponder to emit microwaves or UHF radio waves (i.e., electromagnetic radiation at high frequencies). Battery powered tags may operate at hundreds of meters. Unlike a barcode, the tag does not necessarily need to be within line of sight of the reader, and may be embedded in the tracked object.

Projects

- [Unlock Android Phone with Wearable NFC \(https://adafru.it/dxA\)](https://adafru.it/dxA)

- [Babel Fish \(https://adafru.it/dxB\)](https://adafru.it/dxB)
- [RFID iPhone \(https://adafru.it/dxC\)](https://adafru.it/dxC)
- [Adafruit PN532 RFID/NFC Breakout and Shield \(https://adafru.it/dxD\)](https://adafru.it/dxD)
- [Adafruit NFC/RFID on Raspberry Pi \(https://adafru.it/dxE\)](https://adafru.it/dxE)