

Open Software & Open Hardware

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What is open software?

Two ideas/concepts: Open Source and/or Free Software

Open Source Software

Gives you access to the source code
and the right to change as long as you stick to some rules
defined in the **license**

What is free software?



Free Software: The freedom to ...

- ... **run** the program, for any purpose (freedom 0).
- ... **study** how the program works, and change it so it does your computing as you wish (freedom 1). **Access** to the source code is a precondition for this.
- ... **redistribute** copies so you can help your neighbor (freedom 2).
- ... **distribute copies of your modified versions** to others (freedom 3).
By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

See: <https://www.gnu.org/philosophy/free-sw.html>

Free beer or free speech or both?

Free Software includes both aspects -

Free of charge and free to be changed/run/modified.

This does not mean that you cannot make a business out of it -

You may well charge money for software and/or services around it.

Licenses

The most important free / open licenses are:

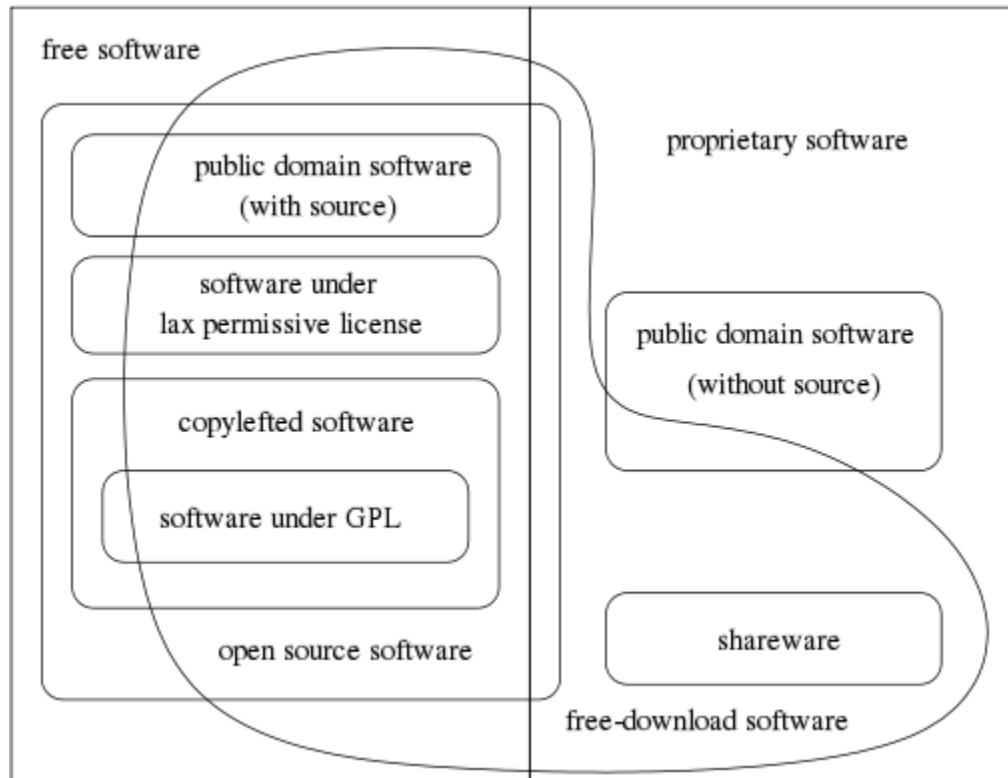
- GPL (General Public License)
- LGPL (lesser GPL)
- BSD license (Berkeley Software Distribution)
- Apache License
- Creative Commons licenses

There are many variations, discussions and conflicts around these!

The most important principle is:

Follow the license you have chosen! Don't cheat!

Licenses



Licenses

License and specific version ↕	FSF approval ^[3] ↕	Compatible with GPL ↕	OSI approval ^[2] ↕	Copyfree Initiative approval ^[4] ↕	Debian approval ^{[5][6]} ↕	Fedora Project approval ^[7] ↕
Academic Free License	Yes	No	Yes	No	?	Yes
Affero GPL version 3	Yes	Yes ²	Yes	No	Yes	?
Apache License version 1	Yes	No	Yes	No	Yes	Yes
Apache License version 1.1	Yes	No	Yes	No	Yes	Yes
Apache License version 2	Yes	Yes ²	Yes	No	Yes	Yes
Apple Public Source License version 1.x	Yes	No	Yes	No	No	No
Apple Public Source License version 2.0	Yes	No	Yes	No	No	Yes
Artistic License 1.0	No	No	Yes	No	Yes	No
Clarified Artistic License (draft 2.0)	Yes	Yes	Yes	No	Yes	Yes
Artistic License 2.0	Yes ³	Yes	Yes	No	Yes	Yes
Berkeley Database License	Yes	Yes	Yes	No	?	?
Original BSD license	Yes	No	No ^[8]	No	No	Yes
Modified BSD license	Yes	Yes	Yes	Yes	Yes	Yes
Boost Software License	Yes	Yes	Yes	Yes	?	Yes
CeCILL	Yes	Yes	No	No	?	Yes
Common Development and Distribution License	Yes	No	Yes	No	Yes	Yes
Common Public License	Yes	No	Yes	No	?	Yes
Creative Commons licenses (Tags: by & sa)	Yes	No	?	No	≥ v3.0 only ^[9]	Yes
Creative Commons licenses (Tags: nc & nd)	No	No	?	No	No ^[9]	by-nd only
Cryptix General License	Yes	Yes	No	Yes	?	Yes
Do What The Fuck You Want To Public License (WTFPL)	Yes ⁴	Yes	No ^[10]	Yes	?	Yes
Eclipse Public License	Yes	No	Yes	No	?	Yes

Terms & Abbreviations

You will find many different words and a lively discussion around them - e.g.

- Public Domain
- FOSS / **FLOSS**
(Free and Libre and Open Source Software)
- Copyleft
- Freeware (**VERY DIFFERENT! NOT open or free!**)
- Shareware (**VERY DIFFERENT! NOT open or free!**)

The important things

... **free software** gives developers, researchers and users the right to **run, study, change and share**

... free software allows you to **know what's going on inside the box** (e.g. the election box, the sensor network, ...)

... free software is often better and more stable than any proprietary software

... free software allows bugs to be found, discussed and removed

Free software

... is the **basis of large parts of the internet** and development around it:

- BSD, GNU/Linux (operating systems)
- Perl, PHP, python, ruby, GCC (programming)
- Apache (web server)
- Postfix (mail)
- MySQL (Database)
- BIND (DNS)
- Freeradius (AAA)

Free software

Proprietary successes like **Google, Amazon, Facebook** rely heavily on **Free Software**

NSRC.org centers its training and engineering around open and free software

Free software for users

Free Software can replace most, if not all, proprietary software on the users' desktop:

- Linux, BSD (operating systems)
- OpenOffice, LibreOffice (Office suites)
- Mozilla Firefox and Thunderbird (Browser and Mail)
- GIMP (graphics)
- DIA (diagrams)
- Ardour, Audacity (sound)
- ...

Open hardware

Open Hardware is the idea of Free/Open Software, applied to hardware and ultimately, all aspects of technology design and usage:

- Free circuit designs
- Free building instructions
- Free print files

etc etc

Open Hardware

Open Hardware is hardware whose design is made publicly available so that anyone can study, modify, distribute, make and sell the design or hardware based on that design.

open-it-lab.com/open/hardware



Open Source Hardware and Design Alliance

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4x USE, MAKE, LEARN, SELL, CHANGE, COPY,
MANUFACTURE, MASS-PRODUCE, IMPROVE,
DOWNGRADE, UPGRADE, REDISTRIBUTE,
DO ABSOLUTELY WHAT EVER YOU WANT.

FREEDOMS
= UNLIMITED & UNCONDITIONAL

IF YOU DESIGN IT 4 FREEDOM, THEN LABEL IT WITH THE 4 FREEDOMS!

OHANDA Label for Open Source Hardware

4x USE, MAKE, LEARN, SELL, CHANGE, COPY,
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OHANDA Label for Open Source Hardware

Freedom 0: The freedom to use the device for any purpose.

Freedom 1: The freedom to study how the device works and change it to make it to do what you wish. Access to the complete design is precondition to this.

Freedom 2: Redistribute the device and/or design (remanufacture).

Freedom 3: The freedom to improve the device and/or design, and release your improvements (and modified versions in general) to the public, so that the whole community benefits. Access to the complete design is precondition to this.

Open hardware - examples

Some examples of awesome open hardware:

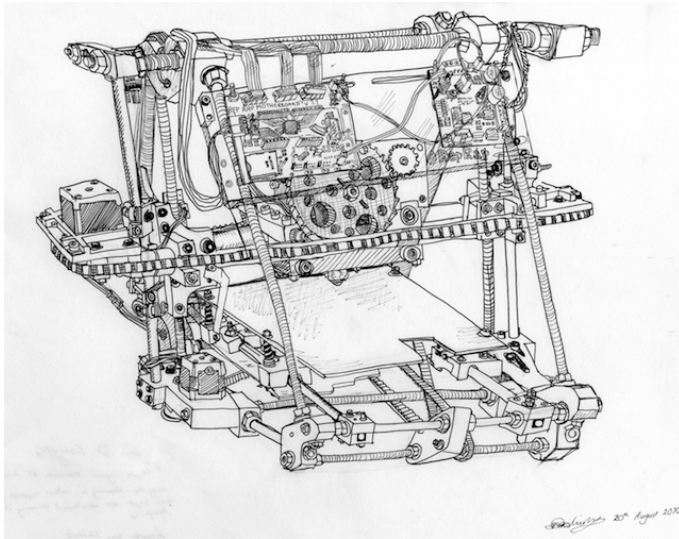
The cantenna :)



Open hardware - examples

Some examples of awesome open hardware:

Makerbot, RepRap – 3D printing

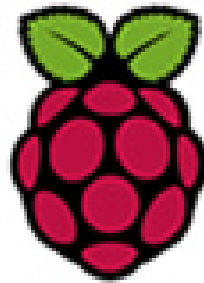


see also:
Thingiverse
(website for free 3D designs)

Open hardware - examples

Some examples of awesome open hardware:

Raspberry Pi – USB computer



Raspberry Pi™

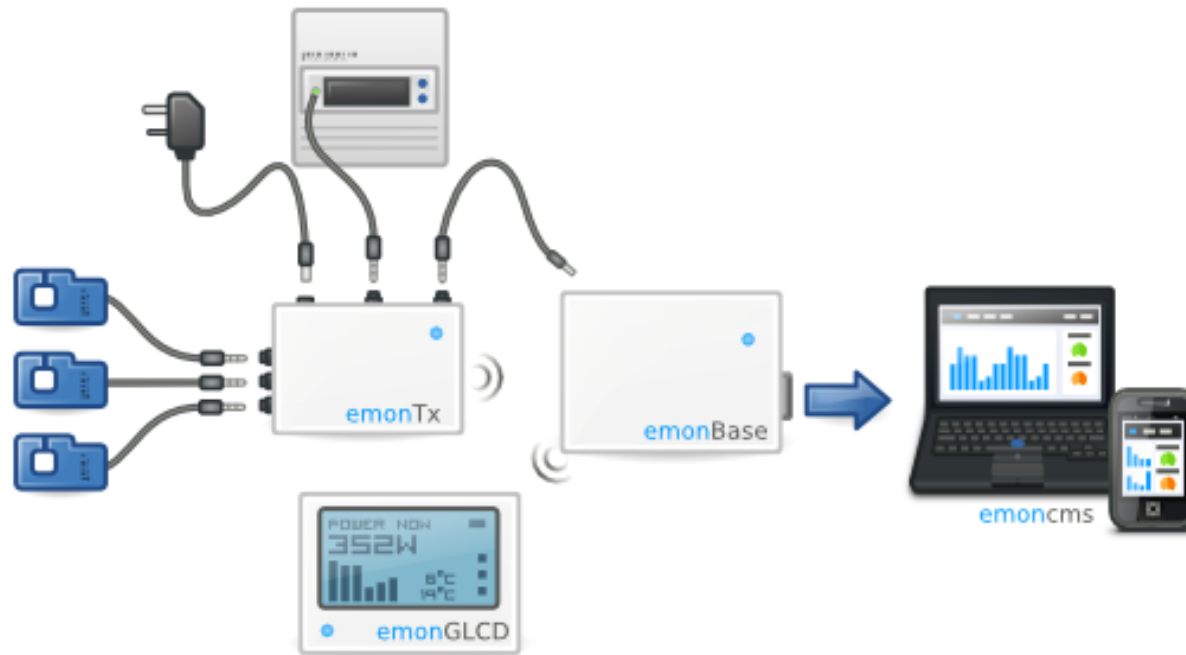


Price: **\$35.00**

Open hardware - examples

OpenEnergyMonitor

The OpenEnergyMonitor system is an end-to-end **open-source energy monitoring system** that is [Arduino IDE](#) compatible:



Open hardware - examples

and last not least:

- **Arduino - electronics platform**

**Software & Hardware are
under free software licenses
(Creative Commons licenses)**

