

# EnOcean Protocol

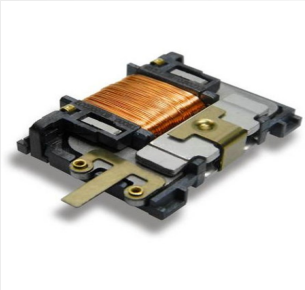


What is it?

- Energy harvesting wireless technology used primarily in building automation systems, also used in applications like industry, transportation, logistics and smartphones
- International standard ISO/IEC 14543-3-10 that covers the OSI layers 1 to 3 (physical, data link and network)

# Energy harvesting

Collection of small amounts of environmental energy and conversion into energy for wireless communication

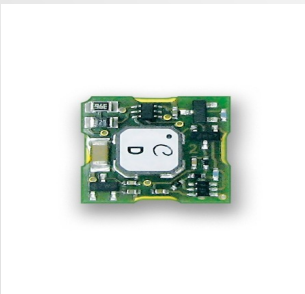
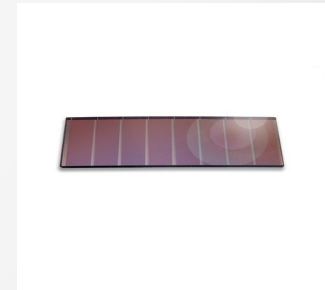


## Energy from Motion

This principle uses the power of motion to generate energy for wireless signals.

## Energy from Light

Wherever there is light, even at low level of 200 lux or less, tiny solar cells can harvest this source of energy for a broad range of battery-less sensors.

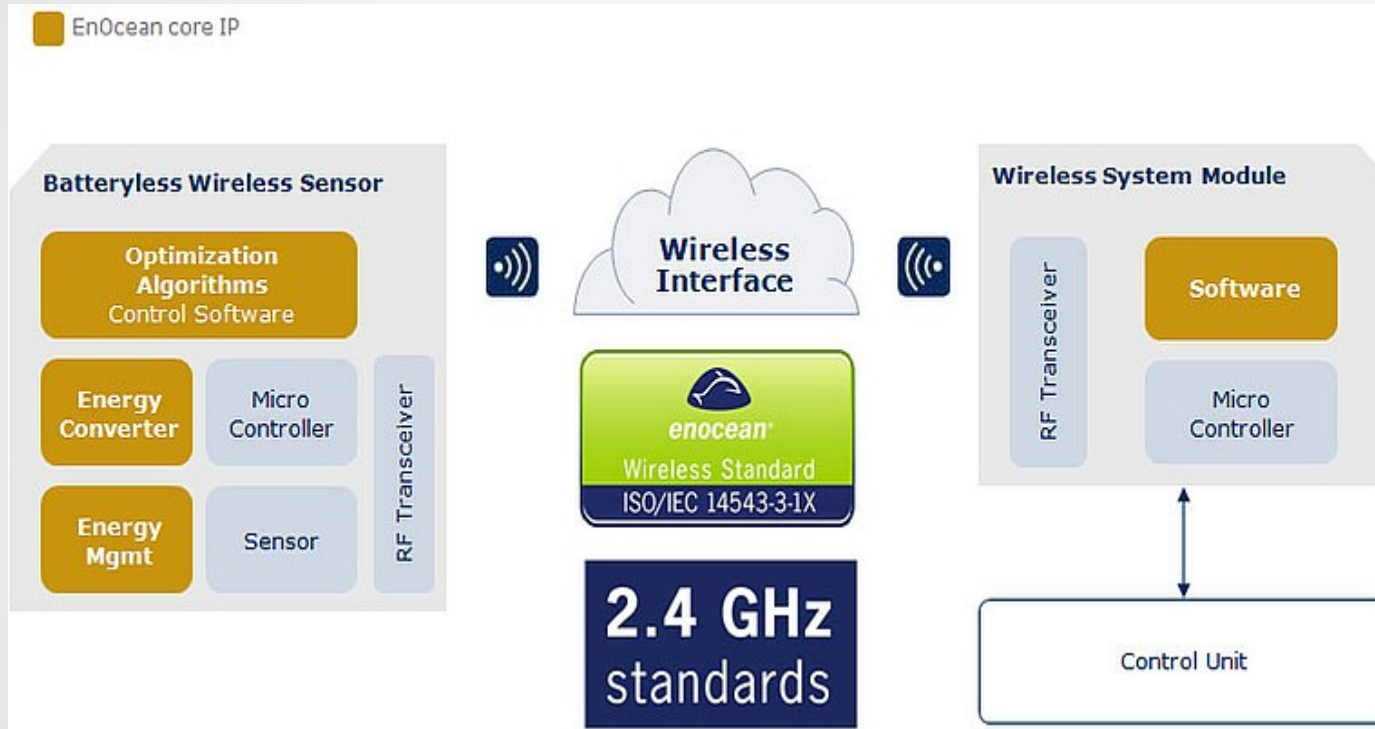


## Energy from Temperature

A temperature difference of already 2 °C delivers enough energy for electronic devices, enabled by the combination of a DC/DC converter and a peltier element.

# Radio Technology

## EnOcean architecture:



- Patented EnOcean energy harvesting wireless sensor solution is able to generate a signal of high range from an extremely small amount of energy.
- From just 50  $\mu$ Ws a standard EnOcean energy harvesting wireless module can easily transmit a signal 30 meters (in-doors) and up to 300 meters in the open.
- The entire process is started, executed and completed in no more than a thousandth of a second.

# Company



**SIEMENS**



- spin-off company of Siemens AG founded in 2011
- headquarters in Oberhaching, near Munich. Germany
- currently employs 60 employees in Germany and the USA