# Power consumption

## Low-power sensors

Some sensor types are defined as being low power. Low-power sensors must function at low power, with their processing done in the hardware. This means they should not require the SoC to be running. Here are some low-power sensor types:

- Geomagnetic rotation vector
- Significant motion
- Step counter
- Step detector
- Tilt detector

They are accompanied by a low-power (

) icon in the Composite sensor type summary (/devices/sensors/sensor-types.html#composite_sensor_type_summary) table.

These sensor types cannot be implemented at high power as their primary benefit is low battery use. These sensors are expected to be activated for very long periods, possibly 24/7. It is better to not implement a low-power sensor at all rather than implement it as high power, as it would cause dramatic battery drain.

Composite low-power sensor types, such as the step detector, must have their processing conducted in the hardware.

See the CDD for specific power requirements, and expect tests in CTS to verify those power requirements.

## Power measurement process

The power is measured at the battery. For values in milliWatts, we use the nominal voltage of the battery, meaning a 1mA current at 4V must be counted as 4mW.

The power is measured when the SoC is asleep, and averaged over a few seconds of the SoC being asleep, so that periodic spikes in power from the sensor chips are taken into account.

For one-shot wake-up sensors, the power is measured while the sensor doesn't trigger (so it doesn't wake the SoC up). Similarly, for other sensors, the power is measured while the sensor data is stored in the hardware FIFO, so the SoC is not woken up.

The power normally is measured as a delta with when no sensor is activated. When several sensors are activated, the delta in power must be no greater than the sum of the power of each activated sensor. If an accelerometer consumes 0.5mA and a step detector consumes 0.5mA, then activating both at the same time must consume less than 0.5+0.5=1mA.