

Low Power Consumption And Extended Battery Life With SensorBeat AI On The Edge

Many IoT-systems and wearable technologies consume excessive power and as battery drain can render a product unusable embedded design engineers are increasingly looking to improve power efficiency. Extending the battery life can enable devices on a strict power budget to last significantly longer on a single charge.

SensorBeat

Imagimob's SensorBeat software solves the issue of limited power supply as it reduces the need to transmit data over power hungry methods like 2G/3G/4G/WiFi/Bluetooth LE. SensorBeat's power-preserving capabilities can be especially critical in battery-powered products where every microamp and even nanoamp counts.

SensorBeat is analysing sensor data closer to where it's collected i.e., on the edge, and runs on the device itself thus lowering the power consumption substantially, prolonging battery life.

SensorBeat AI On The Edge provides a number of distinct benefits leading to lower power consumption:

- Less data to transmit
- Less frequent data transmissions
- Better quality in the transmitted data
- Lower costs for data transmission

Use Case - actual measurements

This concrete, real world example where SensorBeat was configured to recognise the activities of walking and running illustrates SensorBeat's effect on power consumption.

In this scenario the device is expected to be used 24/7, ie 24 hours, 7 days a week. We provide both raw values of direct consumption, and translate this to the expected battery life with specified components.

Hardware:	ARM Cortex M3 processor
Platform:	Texas Instrument CC2640
Sensor:	Mcube MX3635 Accelerometer (ultra low power mode, 50Hz sampling frequency, 30 samples FIFO depth)
Battery:	500mAh coin cell battery *
Required battery life:	6 months +

*) Coin cell batteries are widely used due to their low cost, small size and low weight.

Actual measurements and explanation of the use case:

SensorBeat execution time:	33 milliseconds / second (50Hz accelerometer)
Power consumption during execution:	3,3mA
Average power consumption:	110 μ A (3,3mA * 0.033 seconds)
Power budget:	500mAh (500 000 μ Ah)
Battery life equation:	$(500\ 000\mu\text{A} / 110\mu\text{A}) / 24 / 30 = 6.32$ months.

The customer had the goal of having at least 6 months of battery time. In the power test, we could prove that the battery will last 6,32 months with the current setup.

Finally, to simplify the development process, speed up time to market and achieve optimal energy efficiency, an extended battery life is critical for most connected devices in order to gain a wide market acceptance.

Keywords: IoT, AI On The Edge, Real Time, SensorBeat, Bluetooth LE, Wifi, Low Power Consumption, Battery Life Expectancy, Artificial Intelligence On The Edge, LPWAN, Data Transmission, Embedded.



For more information about SensorBeat and AI on the Edge visit [imagimob.com](https://www.imagimob.com)

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