

Application Note: AT100 Power Saving Features

Overview

The AT100 is the most power efficient GPS/GPRS tracking device available. In continuous operation, average power consumption is less than 300mW. In this mode, the internal battery will last up to 8 hours. The AT100 can be left in a stationary vehicle for several weeks without causing battery drain problems. With smaller batteries or when longer operating life is required, there are numerous features which can be employed to reduce average power consumption and extend battery life further.

Timed Reporting Mode

In continuous operation mode, the AT100 reports full journey details, including:

- journey starts/stops,
- journey max speed
- journey distance
- idle-time
- max. acceleration
- max deceleration
- reports on distance and heading changes

This is not required for certain applications. If only time based reports are required it is possible to configure the AT100 to power down between timed reporting intervals and thereby reduce power consumption significantly. This mode is activated by disabling distance and heading reports (i.e. set DIST and HEAD to zero). In this mode, the AT100 reports only at the timed interval defined by the STIM parameter. In hourly reporting mode, the power consumption is approximately 10 times less than continuous mode, hence battery life is 10 times longer. We call this micropower mode.

Whilst the AT100 is powered down it is not possible to receive OTA commands or NMEA serial commands. The AT100 will only wake at the timed interval or if one of the inputs is activated. With the motion sensor option (AT100M), the AT100 can also wake whenever movement is detected.

This mode can be enabled and disabled remotely by OTA commands, although the change from micropower to continuous mode will not happen until the next scheduled wake up for timed reporting.

Ignition Switched Power Saving

The ignition input can be used to switch the AT100 between continuous mode and timed reporting mode. This feature is controlled by the Ignition Mode (IGNM) parameter. When IGNM = 2, the AT100 will operate continuously whilst the ignition is ON and will switch to timed reporting mode 5 minutes after the ignition is

switched OFF. The AT100 will wake immediately after ignition is switched ON. GPS will not obtain a fix for at least 20 seconds after waking (can be longer, depending on antenna location), hence in this mode, the first few miles of a journey can be missed.

Battery Life Calculations

Precise battery life is difficult to predict due to the effects of temperature, GPS availability, GSM network availability, GSM transmit power levels and reporting profiles. However, a rough estimate can be easily calculated for any given battery in certain modes of operation. The average power consumption in the two main modes of operation are as follows:

Continuous mode	(always ON)	300mW
Micropower mode	(hourly reporting)	30mW

We can use these figures to estimate battery life as follows:

Step 1

Calculate the battery Watt-Hour rating by multiplying the nominal rated battery voltage by the rated Amp-Hours. For example, with a 2S2P 18650 lithium ion battery pack, this would be $7.5V \times 4.4Ah = 33Wh$.

Step 2

Divide the battery Watt-Hour rating by the average power consumption (in Watts) for the required operating mode. For example, in continuous operating mode, power consumption is 300mW, which is 0.3 Watts. For the above battery, we divide 33 by 0.3 to get the typical operating life of 110 hours, which is approx. 4.6 days.