

## Application Note: AT220 Low Power Mode

### Overview

The AT220 is a low power GPS/GPRS vehicle tracking device . In continuous operation, average power consumption is approximately 350mW (when the internal battery is fully charged). In this mode, the internal battery will last approximately 18 hours. The AT220 can be left in a stationary vehicle for several weeks without causing excessive battery drain. With smaller batteries or when longer operating life is required, Low Power Mode can be used to reduce average power consumption and extend battery life further.

### Related Documents

The following documents are recommended reading to accompany this application note:

- AT220 User Guide
- AT220 Installation Guide

These documents can be obtained from:

<http://www.gps-telematics.co.uk/downloads.htm>

### Compatibility

AT220 Low Power Mode is supported on hardware AT220A and AT220B from firmware version 1.2.xx and later

### Continuous Reporting Mode

In continuous operation mode, all power saving features are disabled. When the vehicle ignition is off (engine not running), the AT220 stays awake and reports on timed intervals or other events (power status, tow alarms etc.). Device communications are kept online, TCP sockets are left open, SMS can be received and handled/replied to immediately and the GPS maintains navigation (assuming there is sufficient visibility of the sky).

When the vehicle ignition is switched on, the device is ready to report immediately in this mode of operation.

Approximate average power consumption in continuous mode is 350mW (approx. 25mA @ 13.8VDC), which is sufficiently low to allow a typical vehicle to be parked for up to 2 weeks with no risk of excessive battery discharge.

The AT220 operates in continuous mode when IGNM is set to 0, 1 or 3.

## Low Power Mode

In this mode, the AT220 reports full journey details as it does in continuous mode, but shuts down into a very low power sleep mode when the vehicle ignition is switched off (after a 3 minute delay). Whilst in sleep mode the device will no longer communicate and the GPS receiver is switched off. The AT220 will wake periodically (every STIM minutes) to get a new GPS fix and send a timed report.

The AT220 will wake immediately in response to the following events:

- Vehicle ignition ON
- Change of external power status
- Movement (based on internal trembler and/or accelerometer)

Following wake from sleep mode, GPS will require at least 20 seconds to obtain a first fix, so wake events (including journey start reports in the case ignition based wake up) will be reported using last known good GPS data. The GPS invalid flag will be set, but it's safe to assume that the start location is the same as the stop location (assuming that was sent with valid GPS).

The AT220 operates low power mode when IGNM is set to 2.

## Communication with Devices in Sleep Mode

Whilst the AT220 is powered down it is not possible to receive commands by either TCP, SMS or RS232 serial modes. The AT220 will check for SMS commands each time it wakes, although the timing of pending SMS delivery is rather uncertain and there can be delays. There is no guarantee that a pending SMS will be received and handled during a timed wake up event.

## Timeouts

When a device wakes to send a timed report, it will try for a certain time to get a new GPS fix and send that to the host server. If either GPS fix or GSM/GPRS communications are unavailable within the expected time, the device will power down to conserve power and retry at the next timed interval (or other wake event).

## Power Consumption

Approximate power consumption figures are given in the table below:

Mode	Power Consumption	Current Consumption @ 13.8VDC
Continuous	350mW	25mA
Sleep* (no internal battery)	< 55mW	< 4mA
Sleep* (internal battery fitted)	< 700uW	< 50uA

\*when the internal battery is fitted, the device disables the external voltage input and operates from the internal battery in sleep mode to minimise the drain on the external power source to an absolute minimum.

## Battery Life

Operating Mode	Reporting Rate	Operating Life
Continuous Mode	hourly	18 hours
Low Power Mode	hourly	14 days