

What factors most affect power consumption and battery life?

In a typical application under normal conditions, the factors that most influence power consumption and battery life include:

- OnDemand Polling
- DELAY timeout, T4.
- Extended Motion During DELAY
- GPS Signal Strength
- GSM Coverage

By far and away, setting IDLE State Polling Mode to “OnDemand” will have the most profound impact on power consumption. With OnDemand polling selected, the TrimTrac locator keeps the GSM powered up at all times, except when it is in the FIX state. Depending upon how often the GSM network causes the TrimTrac to re-transmit its identification information, expected battery life for four AA alkaline batteries is approximately 3 to 5 days even for a stationary unit that is not generating any position reports.

It is a toss up between the DELAY Timeout, T4, or Extended Motion During DELAY on which has the next highest impact on power consumption. These two factors come into play only while the device is in motion. The DELAY Timeout, T4, nominally determines how frequently the device will compute a new position fix while in motion. Computing and transmitting a new position fix are comparatively high energy consuming activities, everything else being equal. Thus, the more frequently the unit computes a new position fix, the higher the power consumption resulting in shorter battery life.

As the DELAY Timeout, T4, is increased, however, Extended Motion During Delay begins to have a material impact on power consumption. Enabling Extended Motion During Delay keeps the software filtering of the motion detective active. This requires running the microprocessor during the DELAY state. While the current draw is small, it is still not as low as it otherwise would be during the DELAY state if this option were not enabled.

With a strong GPS signal (-130 dBm), the TrimTrac will compute a new position fix in approximately 40 seconds. As GPS signal levels weaken, however, then the time to compute a new position fix is increased. With a weak GPS signal (-136 dBm), for instance, the device can take up to 400 seconds and this is assuming that GSM network coverage is also available. Computing a GPS fix is a comparatively power intensive task and taking 400 seconds to derive a new fix at -136 dBm will have a commensurate impact on power consumption and battery life.

Finally, whether or not GSM coverage is available may impact power consumption. The TrimTrac locator gets frequency assistance from the GSM network to help minimize oscillator errors. A more accurate oscillator helps minimize GPS fix times, everything else being equal. If a GSM network is not available, the TrimTrac locator will take incrementally longer to compute a new position fix. Compared to the other factors listed above, however, GSM coverage has only a nominal impact on long-term power consumption.