Global Modem Battery Power Considerations

Global Modem Power Specifications and Observations
Voltage: 12 Volts DC nominal. (Acceptable range 6-28 VDC)
Absolute Peak Current: 1.6 amps
Average Current during data transmission cycle, C_{avg}: 50ma

Discussion

The CR1000 data logger powers the Global Modem up only when it needs to send data, so most of the time the Global Modem is consuming zero power.

You must design your power supply to provide the Global Modem's Absolute Peak Current requirement. Beyond that, the power consumed depends upon the data reporting cycle and the signal quality perceived by the modem. I your antenna has a very limited view of the sky, the modem will spend more time waiting for network connectivity, hence more "on time".

So, if you send one report per hour, and the modem is powered up for 1 minute to send that report, the modem's power budget would look like this:

Duty Cycle, DC = 1/60 = 0.02

Total Average Power Consumption = DC * C_{avg} = 0.02 * 50ma = 1ma

So, you can see that if the modem is only powered up for one minute per hour, the average power consumption barely contributes to the site's power budget. If however, something were to happen to the antenna or coaxial cable, the logger will keep the modem powered up for much longer intervals, which would affect the average power consumption. A more conservative design would require the power supply to accommodate the full 50ma Average Current, which the modem would consume if it were always powered up.

In high latitudes, we normally power weather stations with a single 100AH 12V battery charged by a 30 watt solar panel. The large battery provides for the 3 month period of almost no solar gain. At lower latitudes one could easily get by with a 15 or 25 AH battery and a 20 watt solar panel.