

Power Draw Profile for Trimble NetRS and Iridium Systems

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Test Summary

UNAVCO performed a benchtop test to record a high-resolution time history of power consumed by a Trimble NetRS GPS system with Iridium communications. The test system consisted of a Trimble NetRS receiver with Trimble Choke Ring antenna, NAL Research A3LA-I modem with SAF5350C antenna, Flexcharge NC30L12 solar regulator, and an ABB RS1A44 timer switch. This system represents the UNAVCO best-practices polar GPS station as of June 2006.

The test was performed at room temperature. A variable DC power supply was used to deliver 12.0 VDC to the battery input terminals on the power board, with current and voltage recorded at 10 Hz by a data acquisition computer running LabView. The data acquisition routine clipped the current burst signals above 1 amp (12 W) during Iridium data download, however this threshold was usually close to the true peak height of the ~0.1 second pulses. For longer duration, stronger bursts, a conservative visual estimation of the true peak height was made and used in calculating the power consumption during data download.

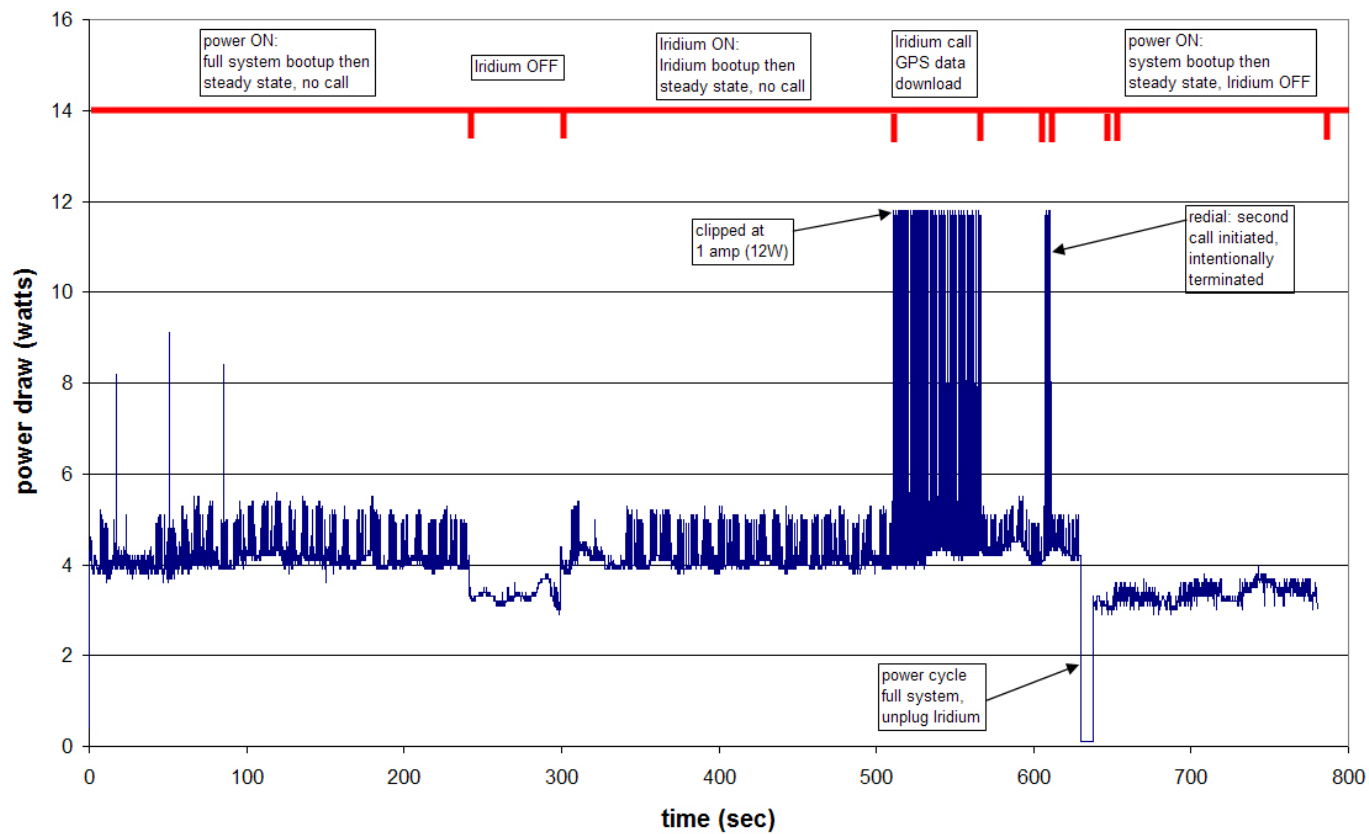
Test Sequence:

1. Power full system with 12.0 VDC.
2. Allow components to boot up and assume steady-state operation.
3. Disconnect Iridium modem for 1 minute.
4. Reconnect Iridium modem and allow system to return to steady-state operation.
5. Execute Iridium download script: call Iridium modem and download small GPS data file.
6. Call was dropped.
7. Iridium download script redials and second call is initiated. Call is user-terminated.
8. Turn off entire system. Disconnect Iridium modem.
9. Turn on system and allow system to reboot and assume steady-state operation (w/o Iridium).
10. Disconnect power.

Results

- The average power draw of the GPS receiver, timer switch, and solar regulator combined is 3.35 W.
- If the Iridium modem is powered with no data download underway, the system average power draw is 4.15 W.
- When a data download is underway, the average power draw is 6.25 W.

The measured power draw time series is presented in the figure below.



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