

SBE 37 Power Budget / (battery endurance calculations, with examples)

...per the SBE 37 specifications...

Quiescent battery consumption: 10 μ A

Consumption per sample (no pump): 0.1 amp-sec (for the duration of the acquisition period)

Pump consumption per sample: 0.148 amp-sec (this is a 0.5 sec pulse, per 5M-2 pulse spec)

Quiescent consumption in AH

Calculation: $0.00001 \text{ A} \times (8760 \text{ hr/yr}) \approx \mathbf{0.09 \text{ AH per yr}}$

Sample consumption in AH

Calculation: $(0.1 \text{ amp-sec} / \text{sample}) / (60 \text{ sec/min} \times 60 \text{ min/hr}) = \mathbf{2.78 \text{ e-5AH/sample}}$

Pump consumption in AH

Calculation: $(0.148 \text{ amp-sec} / \text{sample}) / (60 \text{ sec/min} \times 60 \text{ min/hr}) = \mathbf{4.11 \text{ e-5AH/sample}}$

Example 1: ½ hour sampling intervals for 1 year (NO PUMP)

$(2 \text{ samples} / \text{hour}) \times 24\text{hr/day} \times 365 \text{ days/yr} = 17520 \text{ samples}$

Sample battery consumption = $17520 \text{ samples} \times 2.78 \text{ e-5 AH/sample}$
= 0.49 AH expended for 1 year

Total consumption = $0.49 + 0.09 \approx \mathbf{0.58 \text{ AH}}$

Example 2: ½ hour sampling intervals for 1 year (WITH PUMP)

$(2 \text{ samples} / \text{hour}) \times 24\text{hr/day} \times 365 \text{ days/yr} = 17520 \text{ samples}$

Sample battery consumption = $17520 \text{ samples} \times (2.78 \text{ e-5AH/sample} + 4.11 \text{ e-5AH/sample})$
= 1.2 AH expended for 1 year

Total consumption = $1.2 + 0.09 \approx \mathbf{1.3 \text{ AH}}$