

1. Daily Power Draw Sizing

Starlink Model	Operating State	Average Draw	8-Hour Workday	24/7 Continuous
Starlink Mini	Standard / Idle	15W – 30W	240 Wh (20 Ah @ 12V)	600 Wh (50 Ah @ 12V)
Starlink Mini	Snow Melt / Heavy Load	50W – 60W	480 Wh (40 Ah @ 12V)	1,200 Wh (100 Ah @ 12V)
Standard / Gen 3	Standard Usage	50W – 75W	480 Wh (40 Ah @ 12V)	1,440 Wh (120 Ah @ 12V)
High Performance	Heavy / Enterprise	100W – 140W	960 Wh (80 Ah @ 12V)	2,640 Wh (220 Ah @ 12V)

2. System Setup Losses & Calculation Formulas

Efficiency Multipliers:

Direct DC / USB-C PD: × 1.15 (15% loss) | AC Inverter Setup: × 1.25 (25% loss)

Required Battery Capacity (Wh): (Adjusted Daily Wh) ÷ 0.85 (85% Depth of Discharge)

Required Solar Panel Size (Watts): (Adjusted Daily Wh) ÷ (Regional Peak Sun Hours)

3. Recommended Battery & Solar Sizing (12V LiFePO4)

Usage Scenario	Daily Consumption	Rec. LiFePO4 Battery	Rec. Solar Array
Starlink Mini (8 Hours / Direct DC)	~275 Wh	350 Wh (~30 Ah)	100W Panel
Starlink Mini (24/7 / Direct DC)	~690 Wh	800 Wh (~65 Ah)	200W Panel
Starlink Gen 3 (8 Hours / Direct DC)	~550 Wh	700 Wh (~55 Ah)	150W – 200W Panel
Starlink Gen 3 (24/7 / AC Inverter)	~1,800 Wh	2,200 Wh (~180 Ah)	400W+ Panel

4. 12V Wire Gauge & Voltage Drop Sizing (Starlink Mini)

Cable Distance	12V Wire Gauge	Voltage Drop at Peak	Recommended Solution
0 to 10 Feet	16 AWG	~3.2% (11.6V left)	Direct 12V Cable / 100W USB-C PD
10 to 25 Feet	14 AWG	~4.8% (11.4V left)	12V-to-24V Step-Up Converter
Over 25 Feet	12 AWG	> 6.0% (Reboot risk)	12V-to-24V or 48V Step-Up Converter

5. Essential Pro Tips

- **Turn Off Snow Melt Mode:** Disable auto heating in the Starlink App (*Settings > Snow Melt*) to prevent power spikes over 60W.
- **Boost 12V to 24V:** Using a 12V-to-24V step-up converter drops current draw in half and stops startup voltage sags on long wire runs.
- **Tool Battery Protection:** If using power tool batteries (e.g., DeWalt), swap batteries when the gauge drops to 1 bar to prevent deep discharging.