VICOR

Case study:
Wireless battery charger



One wireless charger for all robots

Customer's challenge

As robotic fleets reshape logistic, delivery and inspection industries the demand for more efficient and flexible charging solutions is increasing. At the same time more autonomy requires the elimination of human intervention. Targeted at aerial, mobile, marine and industrial robots this customer, WiBotic, wanted to develop a wireless charging station that avoided unreliable mechanical connectors and intelligently adjusted its output to meet the needs of different robots' onboard batteries. The key goals were:

- Charger output voltage adjustable to accommodate a wide range of batteries
- Low losses over full output voltage adjustment range
- Compensate for voltage drops in long input cabling to charger

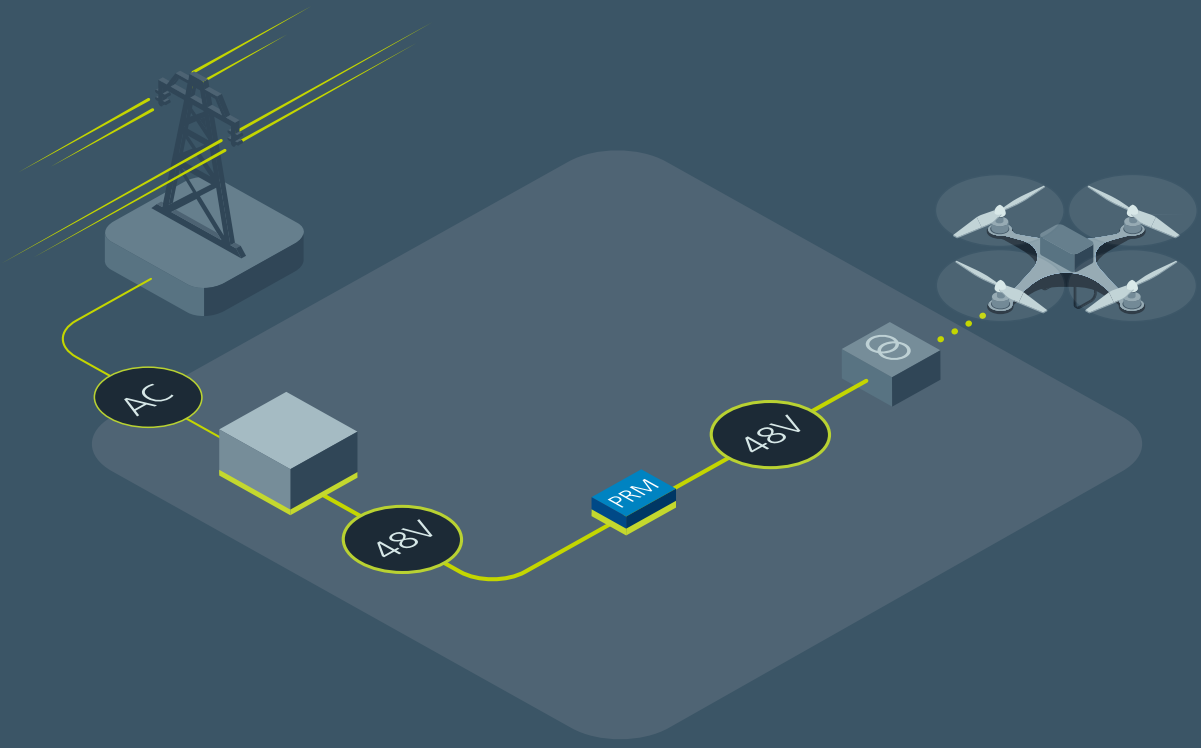
The Vicor solution

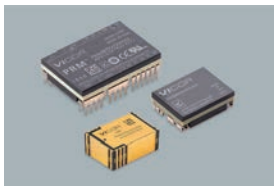
An external AC supply provided the nominal 48V power to the charging station. The voltage varied due to losses in the long cable, which a PRM buck-boost module then regulated. The output voltage and current of the PRM could be varied to match the wide range of battery types of the visiting robots. Key benefits were:

- Extremely wide output voltage adjustment (20 – 55V)
- Highly efficient over full adjustment range (>97%)
- Uniquely capable of handling of wide differences in input and output voltage (up to 10:1)

Vicor PRM regulator provides great flexibility in accommodating wide input and output voltages

Power delivery network: A PRM buck-boost module regulated the widely varying input voltages, providing a precisely regulated output, adjustable over a wide range to suit each robot's battery requirement. To analyze this power chain go to the **Vicor Whiteboard** online tool.





PRM™ regulator

Non-isolated regulated

Input: 48V (36 – 75V)

Output: 48V (5 – 55V)

Power: Up to 600W

Peak efficiency: 98%

As small as
22.0 x 16.5 x 6.73mm

vicorpower.com/prm

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