

Case study:
Fixed-winged HALE UAV



Aircraft gets an 11kW power supply the size of a tablet computer



Customer's challenge

An upgrade to a high-altitude long endurance (HALE) UAV platform included fitting a new, higher-resolution, longer-range radar and improving the telemetry. The upgrade effectively doubled the power required on the 28V internal bus to 11kW. On-board power was from two separate power sources for redundancy. The key goals were to:

- Double the power without allocating more space for the power supply
- Keep aircraft as light as possible for longer flight times
- Improve reliability and adapt to power needs in the future



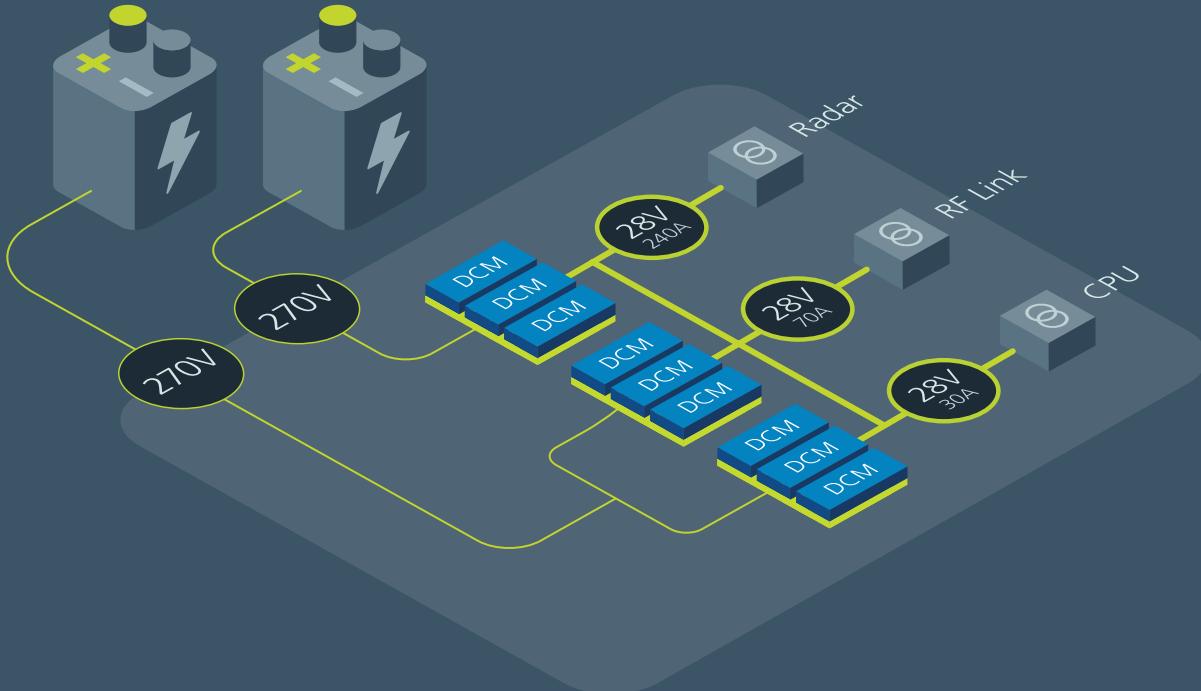
The Vicor solution

The small size, low profile and low weight of the Vicor DCM™ DC-DC converter module enabled the supply output power to be doubled without exceeding allocated space constraints. The high efficiency (96%) reduced the size of the heat sink required, saving more space. Key benefits were:

- 11kW solution in the size of a tablet computer weighing only 215g
- DCMs easy to parallel for redundancy and future increased power needs
- Low waste heat of DCM converter reducing cooling requirements, saving further space and weight

DCM DC-DC converters provided the power needed without increasing the size or weight

The Power Delivery Network: Three arrays of three 1.3kW DCM5614 VIA converters were paralleled to provide the regulated 28V bus. Inputs were split between two different generators to provide redundancy of power source. The arrays automatically power shared across all nine converters —though their input voltages differed — helping improve system reliability. To analyze this power chain, go to **Vicor Whiteboard** online tool.



DCM5614

Input: 270V (180 – 400V)

Output: 28V

Power: 1300W

Peak efficiency: 96%

141.4 x 35.5 x 9.4mm

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DCM modules

Input: 9 – 420V

Output: 3.3, 5, 12, 13.8, 15, 24, 28, 36, 48V

Power: Up to 1300W

Peak efficiency: Up to 96%

As small as 24.8 x 22.8 x 7.2mm

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