



Supporting more functionality, increased payload and longer run time



Customer's challenge

Tethered drones provide warfighters with the unique ability for rapid deployment with greater flexibility and C5ISR capability than legacy solutions. They provide the capabilities of today's advanced tethered drones and allow for greater payload options to support mission success. Key goals were:

- Capabilities that can be transported by smaller or fewer vehicles
- Provide increased payload
- High efficiency for more extensive missions



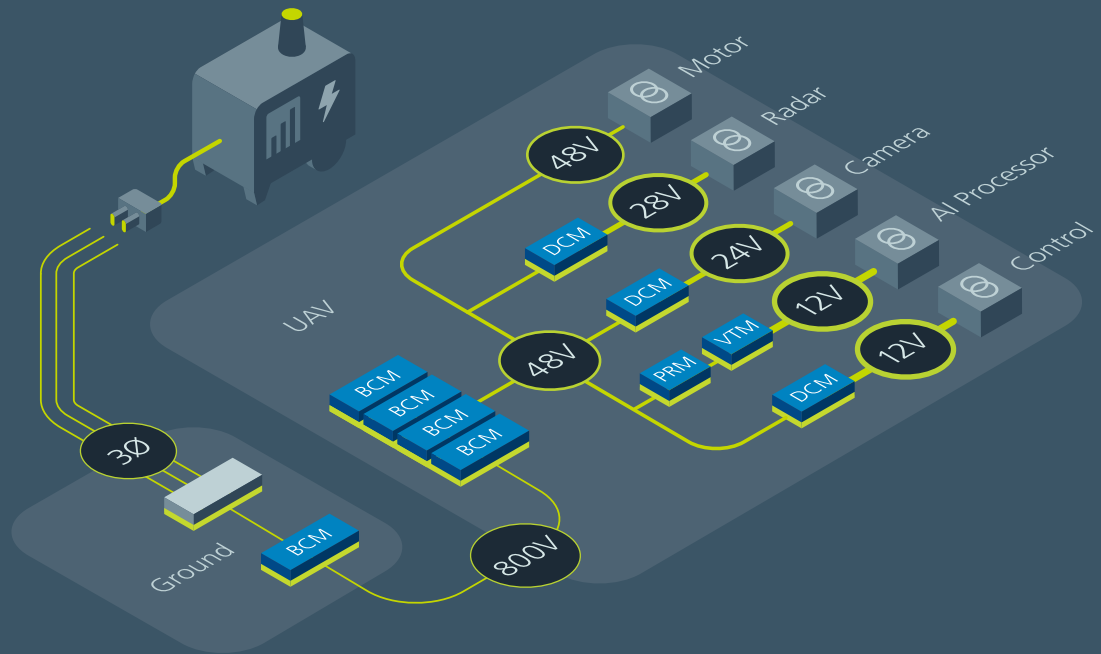
The Vicor solution

Vicor compact, high-performance power modules significantly reduced weight and size both in the ground power supply as well as on board the UAV. This allows for more complex missions with longer time in the air. Utilizing an efficient 48V bus on board the UAV, the power delivery network employs high density power modules to power the various reconnaissance capabilities. Key benefits were:

- Smaller ground supply unit and thinner, lighter tether
- High-performance power conversion to and from high voltage and SELV
- Lightweight solutions to power on board loads

The Power Delivery Network

Enabling a truly optimized SWaP performance, the Vicor high voltage BCM[®] bus converter is 1.8kW and 98% efficient, operating from a 500 – 800V bus to deliver an isolated 31.3 – 50.0V in a remarkably small 4.4 x 1.4 x 0.4in package. The power architecture utilizes the bidirectionality of the BCM to create a single-phase or 3-phase AC ground supply that generates an output between 400 and 800V for the lightweight tether and then employs another BCM to convert the 800V back down to 48V in the UAV. Inside the UAV, the 48V bus is efficiently down converted to power the loads using Vicor DCM[™] or PRM[™]/VTM[™] combination.



MIL-COTS BCM bus converter modules

Input: 200 – 400V, 400 – 700V, 500 – 800V

Current: Up to 35A

Efficiency: Up to 98%

As small as 1.28 x 0.86 x 0.26in

vicorpower.com/mil-cots-bcm



MIL-COTS DCM DC-DC converters

Input: 28, 30, 270V

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

Power: Up to 1300W

Efficiency: Up to 96%

As small as 0.98 x 0.90 x 0.28in

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MIL-COTS PRM and VTM modules

Input: 14 – 50V, 38 – 55V

Output: 1.08 – 50V

Current: Up to 80A

Efficiency: Up to 96.5%

As small as 22.0 x 16.5 x 6.7mm (each)

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