VICOR

Case study: Security and inspecting robots




# Compact power modules allow space for advanced sensors that improve security and performance

## Customer's challenge

Robots can go where people cannot, keeping them out of harm's way while maintaining safety and security. Inspection robots can monitor infrastructure more frequently and allow for rapid remediation before problems occur, saving lives, time, and money. Some, with tethers, operate at high voltages of 400V with conversion down to 12V and 1.5kW for propulsion. The key goals were:

- Highly efficient to extend run time
- Capable of managing high-temperature operations
- Supporting a variety of point-of-load voltages

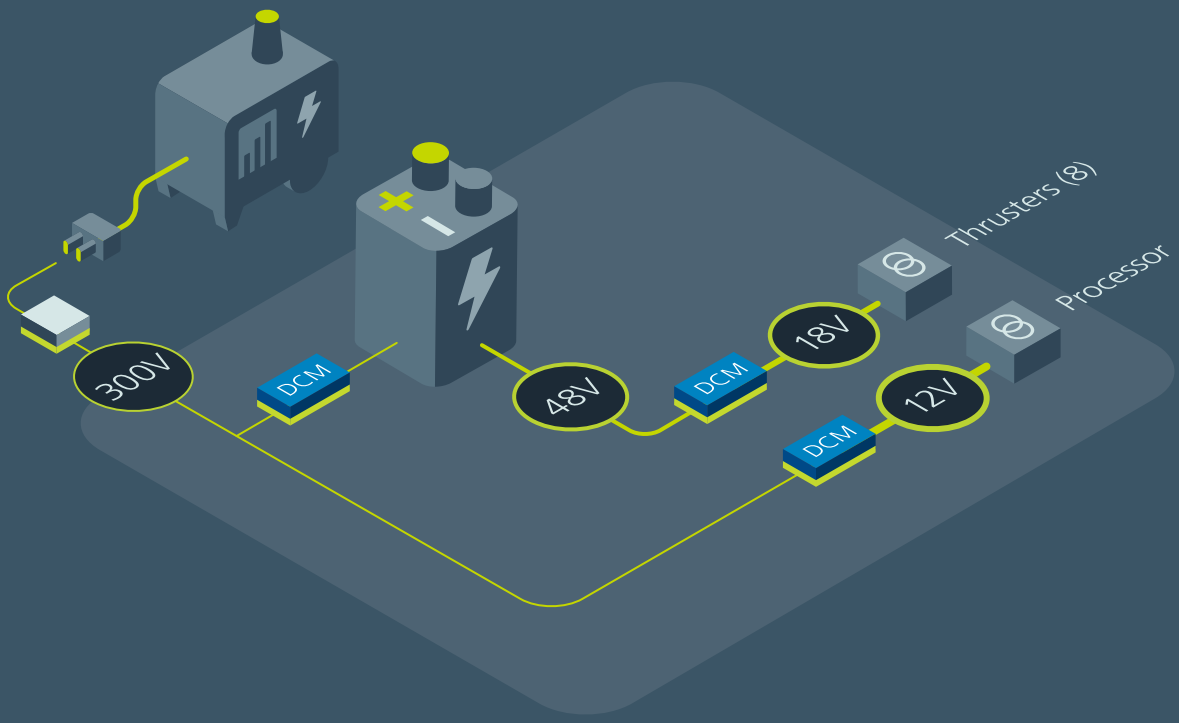
## The Vicor solution

Security robots need to support a host of sensors and actuators to monitor efficiently and effectively and Vicor DCM™ power modules are a thermally adept and very power-dense solution that can power a variety of point-of-load voltages. The power density of the Vicor DCM also helps with routing the wiring and cable assembly and increasing battery efficiency, performance, and runtime. Key benefits were:

- Improved power density and efficiency extend the run time
- The DCM offers advanced packaging and topologies to manage thermal loads
- The DCM can be paralleled easily to accommodate additional system expansion

## The Power Delivery Network

In this example, one DCM4623 isolated, regulated DC-DC converter module converts the 300V tether voltage to 12V to power the controller while another provides a 48V bus that is further converted down to 18V using DCM3623 modules to power a set of thrusters to propel the robot. This modular PDN is smaller than a couple of mobile phones but supplies 1.5kW at 92% efficiency.






DCM™ DC-DC converter

Isolated regulated

Input: 9 – 420V

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

Power: Up to 1300W

Peak efficiency: 96%

As small as 24.8 x 22.8 x 7.21mm

**vicorpower.com/dcm**

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