VICOR

Case study:
Security robot

More patrolling, less recharging

Customer's challenge

The addition of new sensors like LIDAR (light detection and ranging), together with sophisticated onboard AI processors, has allowed autonomous robots to interact more safely with humans. This manufacturer of security robots needed to integrate the new technologies into an upgraded robot platform that could support the higher processor loads while traveling further after a recharge. This required a larger battery and a smaller and scalable power supply to free-up space for it. The key goals were:

- Extend the operational range and duration
- Free-up space by minimizing power supply size
- Flexibility to accommodate power requirements of future sensors

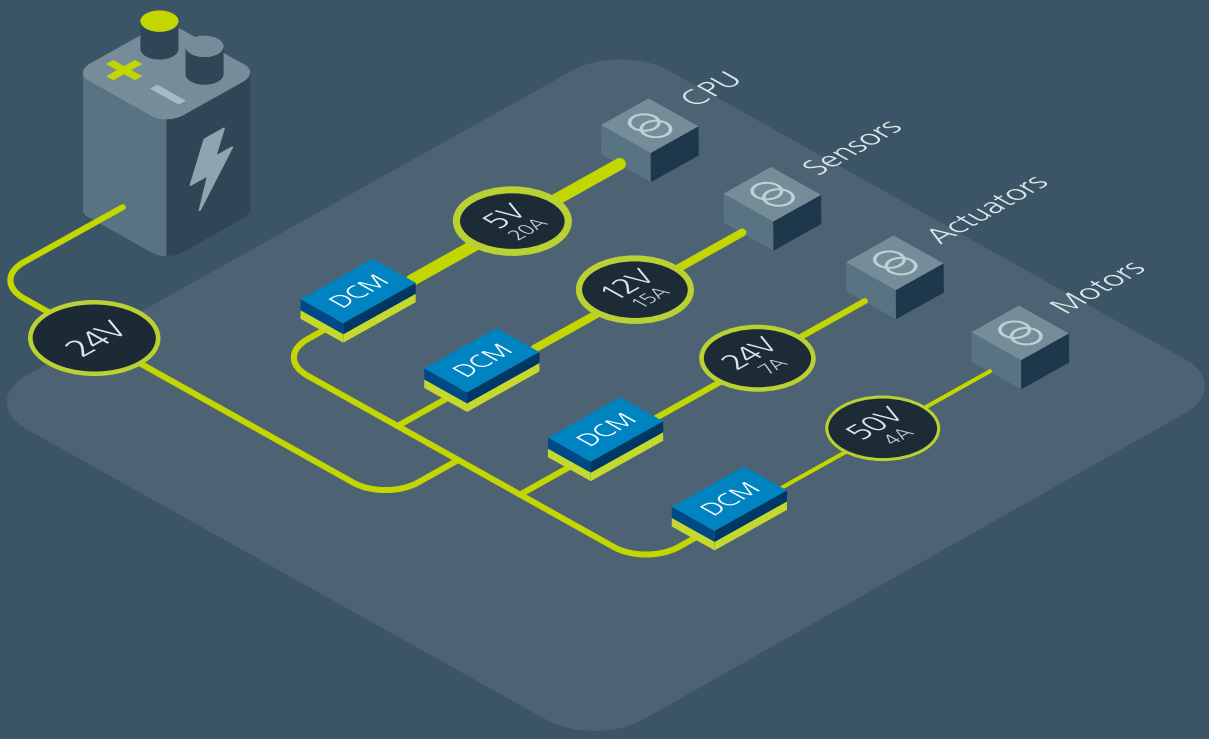
The Vicor solution

The new design employed DCM DC-DC converters for each power rail. These small, highly efficient converters reduced the footprint and weight by 70% compared to the previous brick-based design. It also improved the system efficiency by 30%, reducing power losses and therefore increasing battery range. The DCM's wide input voltage range allows compatibility with future battery technologies. Key benefits were:

- Low loss conversion to maximize performance from battery
- High power density freed up space
- Modular solution to allow future scaling-up of power

The DCM Converters saved space

Power delivery network: Separate DCM DC-DC converters provided each of the four output rails. The converters isolated and regulated the fluctuating battery input voltage. Simple paralleling allows further DCMs to be added in future to meet a higher output power requirement on any rail. To analyze this power chain go to the **Vicor Whiteboard** online tool.



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

vicorpower.com/dcm

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