VICOR

Case study:
Overhead gantry robot



Wide input voltage facilitates contactless power solution

Customer's challenge

For many factories specializing in the fabrication of heavy objects like car engines an overhead gantry provides a convenient way of transporting goods between the various process stages. Adding a robot to each gantry allows increased flexibility at each of the workstations. Typically brushes are used to pick up power on overhead gantry systems. This manufacturer wanted to remove this source of unreliability by switching to a contactless induction power system. The key goals were:

- Improve reliability of energy transmission by moving to a contactless power solution
- Compensate for variations in distance between the inductive transmitter and receiver
- Minimize inertia, and thus the power required to drive the gantry, by reducing weight and size

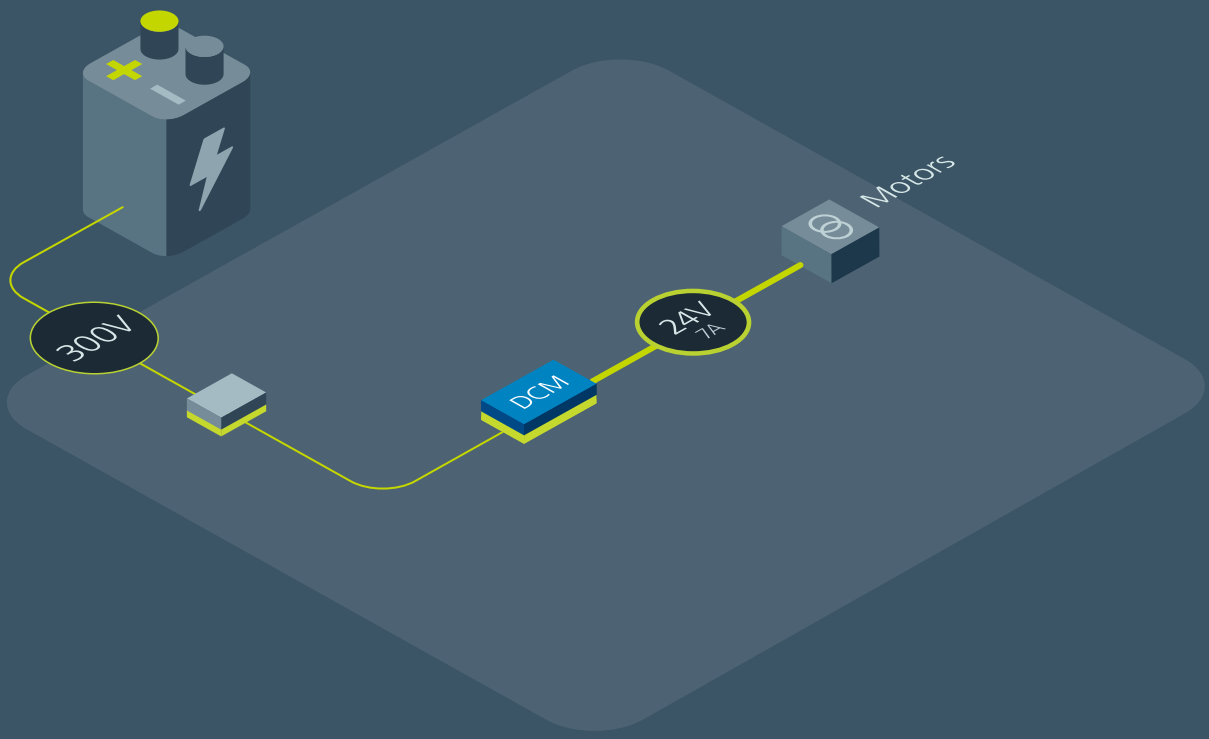
The Vicor solution

The gantry's inductive pick-up generated a widely varying AC output that was rectified and then regulated by a Vicor DCM DC-DC converter. These converters are able to operate over a very wide input voltage range of up to 9 to 1 (high to low input range). This capability enabled the reliable, regulated supply needed for the gantry robot motor drives, actuators and control system. Key benefits were:

- Wide input voltage range (200 – 400V)
- Very low weight (29g)
- Small size (just 47.7 x 22.8 x 7.2mm)

Vicor DCM converter's wide-input range simplifies design

Power delivery network: The DCM converter regulated and isolated the widely varying output from the inductive pick-up, providing a stable output. In addition, the converter's double-sided cooling reduced the operating temperature, providing increased reliability. To analyze this power chain go to the **Vicor Whiteboard** online tool.





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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