VICOR

Case study: Delivery UAVs



Extending delivery missions and saving space for greater payloads

Customer's challenge

Delivery UAVs must safely and securely deliver goods to their intended recipients wherever they are located. The longer the range and ability to handle heavier and larger loads, the more productive these UAVs can be. Because they can operate in congested and complex areas, they must be absolutely safe. They need to incorporate redundancies on multiple layers to avoid harming people, damaging property, or losing their valuable cargo. That means motors, GPS for navigation, vision systems, and other sensors for flight and flight termination require redundant power with incurring significant weight gain. The key goals were:

- Increase flight time to reach greater distances
- Compact and lightweight solution to carry heavier loads
- Supporting a variety of point-of-load voltages

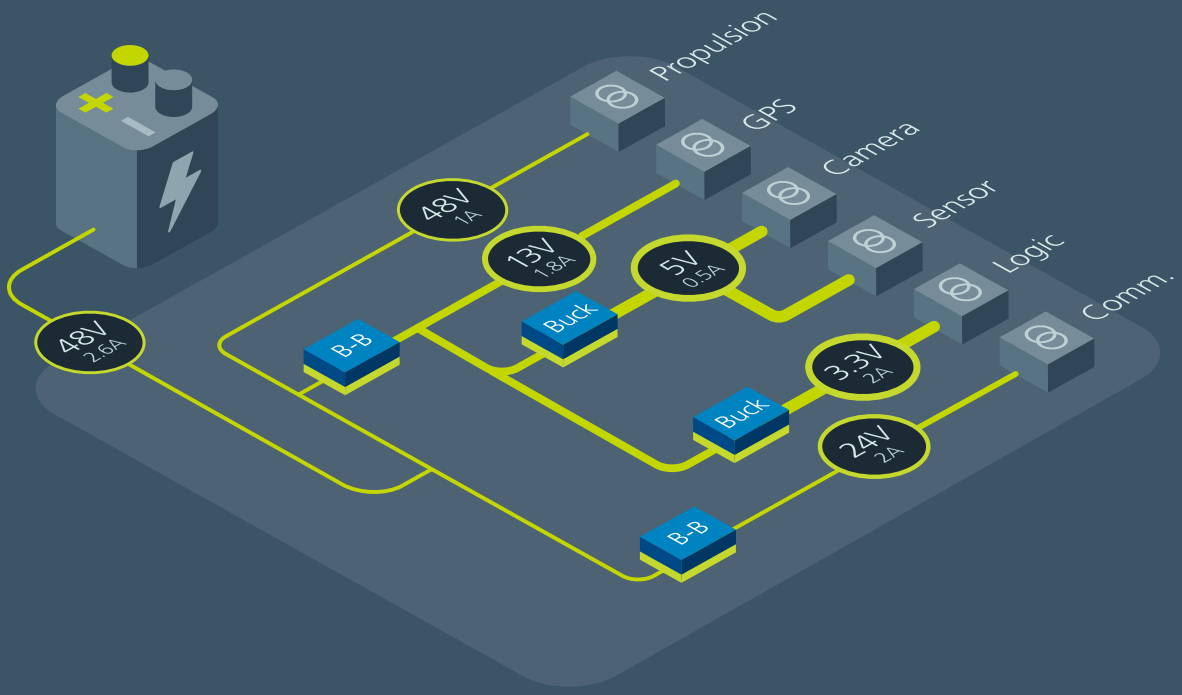
The Vicor solution

Weight is a critical factor for delivery drones. They must maintain a low overall weight in order to increase their payload capacity and fly smoothly to the destination without overstressing the battery. Vicor high power density modules help to reduce the weight of the drone and save on-board space for the sensors needed for safe and effective operation. Key benefits were:

- High-power density enables smaller form factor and lower weight
- Higher efficiency to extend flight times and range of operation
- Compact Vicor regulators enable redundancy when duplicated at the point of loads

The Power Delivery Network

Power dense and lightweight ZVS Buck and Buck-Boost products are ideally suited to enable delivery UAVs to extend their flight times without taking up valuable payload space and weight. PI33xx ZVS buck and PI37xx ZVS buck-boost products are so dense that designers can include multiple point-of-load converters to save on cabling while powering multiple devices with multiple power buses to create the redundancy needed to ensure safe and reliable delivery operations.





ZVS buck regulator

Non-isolated regulated

Input:12V (8 – 18V),
24V (8 – 42V), 48V (30 – 60V)

Output: 2.2 – 16V

Current: Up to 22A

Peak efficiency: 98%

As small as
10.0 x 10.0 x 2.56mm

vicorpower.com/buck



ZVS buck-boost regulator

Non-isolated regulated

Input: 8 – 60V

Output: 10 – 54V

Power: Up to 150W continuous

Peak efficiency: 97%

10 x 14 x 2.56mm

vicorpower.com/buck-boost

©2024 – 2025 Vicor Rev 1.1 4/2025