

General Description

The 250W Power Management Unit provides up to 250 Watts of on-board electrical power generation for small to medium-sized UAVs. The -S version includes an integrated engine starter.

The 250W PMU simplifies UAV power distribution by providing multiple power outputs, which are individually programmable for voltage as well as being battery-backed. The 250W PMU also includes dual (redundant) battery support.

The 250W PMU uses active rectification technology for cooler, more efficient operation.

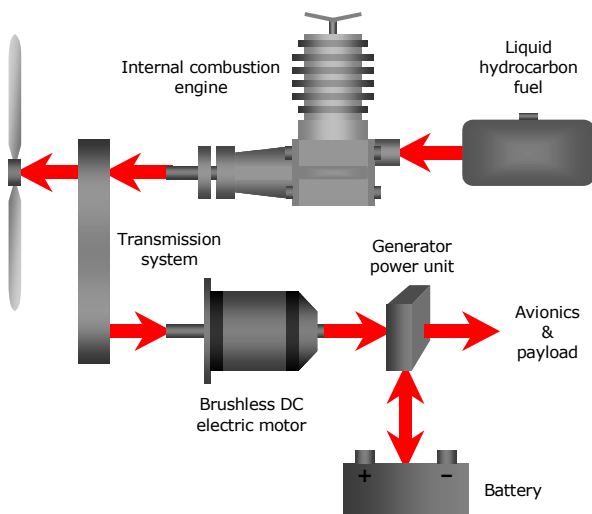


Figure 1: Typical generator system

The PMU connects to a suitable brushless DC electric motor, which is in turn driven by the aircraft's primary power plant, usually an internal combustion engine.

Features

- The -S version includes an integrated engine starter, which may be activated locally via push-button switch, or remotely via command (facilitating in-flight engine restarts).
- Multiple independent, individually programmable power outputs:
 - Avionics: 12 – 24 VDC
 - Payload: 12 – 24 VDC
 - Servo: 5 – 15 VDC

All outputs are battery backed. The Payload and Servo outputs are switchable (on/off) via hardware signal or remotely via command.

- Dual (redundant) battery support. The PMU has two identical fully isolated battery inputs, each with its own universal battery charger. Supported battery types include:
 - Lipo: 4S, 5S, 6S
 - LiS: 6S, 7S, 8S, 9S, 10S
 - AGM: 6-cell
 - Lead-acid: 6-cell
 - LiFe: 4S, 5S, 6S, 7S
- Industry-standard 28VDC output (available during power generation and when the PMU is connected to umbilical power).
- RS232 and CAN control and monitoring interface provides extensive monitoring and reporting of voltages, currents, battery charge status, temperature.
- Inputs and outputs protected from reverse polarity, over-voltage, ESD and short-circuits.

Benefits of active rectification

The first step in turning high-voltage AC into regulated DC is rectification. This process is traditionally performed using a diode bridge, which is an inefficient device that wastes some potentially useful power as heat. Active rectification replaces the diodes with FETs, which have lower loss than either Silicon or Schottky diodes.

As can be seen from figure 3, there is up to 90% reduction in the power lost in the rectification process when an active rectifier is used. This translates into improved overall efficiency, particularly at low rpm where the diode drop is a significant fraction of the rectifier's total voltage.

For the UAS, active rectification means:

- Higher efficiency and therefore reduced fuel consumption and greater aircraft endurance;
- Reduced heating and heatsinking requirements and therefore smaller enclosed volume; and
- Operation to lower rpm.

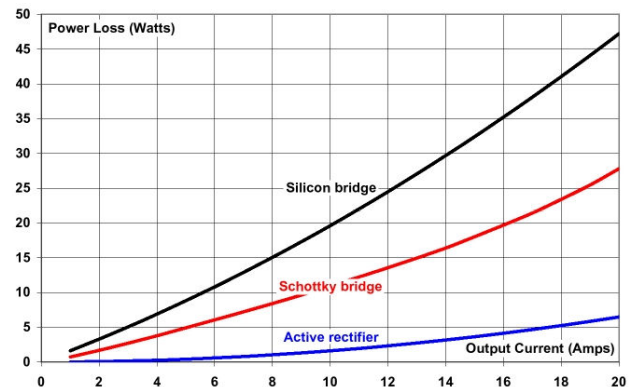


Figure 2: Power loss of a typical 3-phase Silicon diode bridge, a high-performance 3-phase Schottky diode bridge, and our 3-phase active rectifier

Specifications in brief

Electrical:

BLDC motor voltage:	18 to 72 V _{PP} (4:1 RPM range)
Umbilical power:	24 to 48 VDC
Battery voltage:	13.5 to 25.2 VDC
Battery chargers:	2 x 2.5 Amps (2 x 50 Watts maximum)
Avionics output:	12 to 24 VDC, 7.5 Amps continuous (100 Watts maximum)
Payload output:	12 to 24 VDC, 7.5 Amps continuous (100 Watts maximum)
Servo output:	5 to 15 VDC, 10 Amps continuous (150 Watts maximum)
28VDC output:	7.5 Amps continuous (200 Watts maximum)

Miscellaneous:

Environmental protection class:	IP50
Operating temperature range:	-40 to +70°C
Altitude rating:	10,000m
Cooling:	Natural convection, conduction and radiation
Enclosure:	Custom lightweight machined aluminium
Dimensions:	TBA
Weight:	TBA
Connectors:	Harwin M80 (combined signal/power) with jackscrews
Communications protocols:	CAN, RS232

Further Information

The information contained in this product brief is preliminary. For further information please contact either:

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