

## General Description

The Millswood Engineering 1700W Generator Control Unit manages the generation and storage of electrical energy to supply the needs of small to medium-sized UAVs.

The GCU is designed to complement the functionality provided by the 900W PDU (Power Distribution Unit). When installed together, these two units form a complete power supply solution including electrical power generation, battery management and power distribution with redundancy for critical sub-systems.

The GCU includes an optional engine starter. This uses the same BLDC motor and wiring that is used for electrical power generation, saving weight and installation effort.



Figure 1 – 1700W GCU

## Features

- Main power output provides up to 900W at 58.5V for powering vehicle electronics directly or via PDU.
- Two battery chargers, each capable of providing up to 400W of charging power for rapid in-flight recharging.
- Battery chargers user-configurable for both voltage and current, allowing a wide variety of battery chemistries and sizes to be accommodated. Supported battery types include:
  - LiPo: 10 – 12S
  - LiS: 15 – 20S
  - LiFe: 10 – 14S
- Active rectification of 3-phase inputs achieves highest possible efficiency, minimising self-heating.
- Outputs powered by interleaved, spread-spectrum modulated DC-DC converters for best possible EMI/RFI performance.
- Umbilical input: 30 – 120 VDC.
- RS232 and CAN monitoring interfaces provide extensive reporting of voltages, currents and internal temperature.
- Available in either IP67 or slimline enclosure.
- Weight: TBD.
- Dimensions: TBD.

## Block diagram

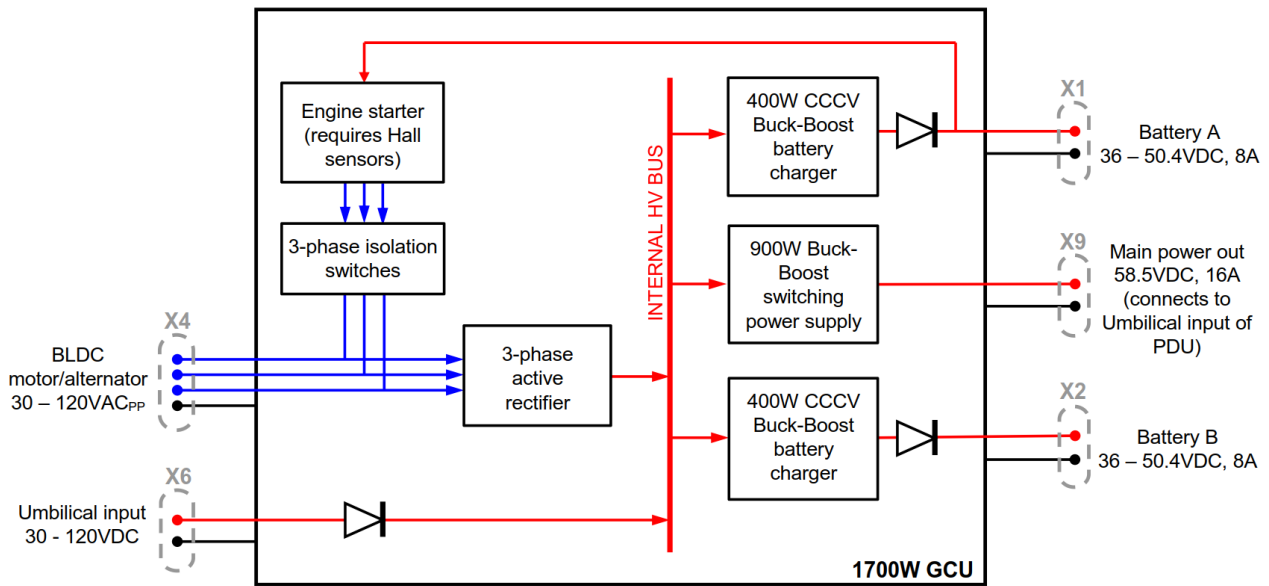


Figure 2 – Internal architecture of the 1700W GCU

This is a greatly simplified diagram showing only the main power pathways. Diodes shown are symbolic; diode functionality is implemented using FETs configured as “ideal diodes”.

## Specifications in brief

### Electrical:

<b>BLDC inputs</b>	30 to 120 VAC <sub>pp</sub>
<b>Umbilical input</b>	30 to 120 VDC
<b>Battery charger outputs</b>	36 to 50.4 VDC, 8 Amps continuous
<b>Main power output</b>	58.5 VDC, 16 Amps continuous
<b>Low-power output</b>	12 VDC, 1 Amp continuous

### Miscellaneous:

<b>Environmental protection class</b>	IP67 or IP50
<b>Operating temperature range</b>	-40 to +85°C
<b>Altitude rating</b>	10,000m
<b>Dimensions</b>	TBD
<b>Weight</b>	TBD
<b>Communications protocols</b>	RS232 (57600 8N1), CAN (1Mb/S)