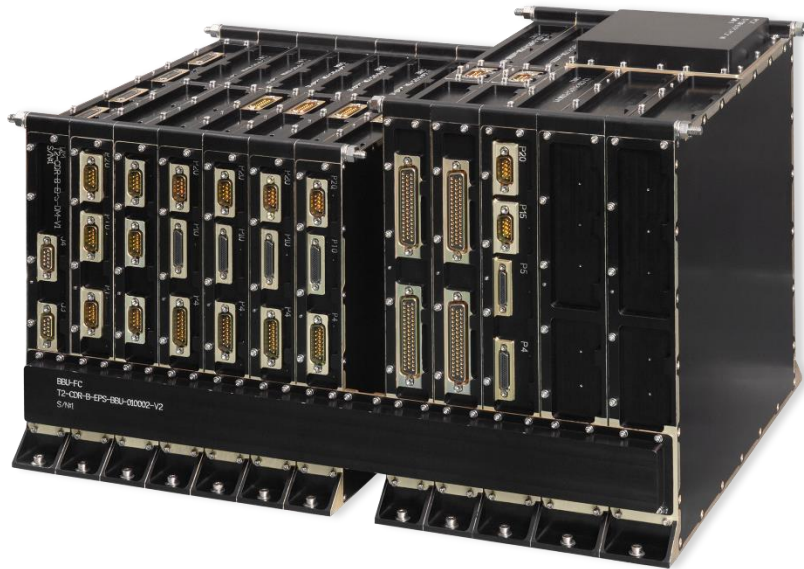


## Power Control & Distribution Unit (PCDU)



### 1. Brief Description

The Power Control & Distribution Unit (PCDU) controls the power flow from the Solar Array and the battery and distributes that power to the whole satellite. It provides efficient power regulation and management to 2 kW of solar power, outputs up to 4 kW of electrical power with protection to bus, payload and all heaters. Its modular and scalable design suits all missions in LEO.

### 2. Key Features

- In-house Heritage Design
  - 7<sup>th</sup> year in orbit without anomalies (TRL-9)
  - Upgraded design (TRL-8)
- Compliant to ECSS power interfaces, de-rating & EMC standards
- Highly Reliable and Fault-Tolerant design
  - Single-Point Failure Free
- > 97% Power Conversion Efficiency
- Designed for 4 kW Peak Power in LEO SAR mission
- Optimised for LEO EO or SAR small to medium-sized satellites
  - Adaptable to HEO/MEO missions with parts update
- Configurable 1 A to 10 A LCL Power Distribution Lines
- Modular & Scalable Power System

### 3. Technical Specifications

General	
System Power	4000 W @ 32 V
Solar Power	2000 W
Payload Power	Up to 3300 W @ 32 V
Primary Bus Voltage	22 ~ 38 V (battery follower)
Solar Array Regulation	Maximum Power Point Tracking (MPPT)
Battery Management	Constant Current (CC) & Constant Voltage (CV) Control
Battery Charge Regulators	2 out of 3 redundancy
Power Conversion Efficiency	> 97%
Reliability	Single-Point Failure Free architecture
Battery under-voltage protection	<ul style="list-style-type: none"> <li>- Disconnect Non-Essential Loads by TC</li> <li>- Configurable hardware cut-off for satellite safe-hold<sup>1</sup></li> </ul>

Interfaces	
Latching Current Limiters	56 LCL @ 10 A or less 48 LCL @ 5 A or less 4 RLCL (retriggerable) for critical lines
Heater Latching Current Limiters	72 heater lines
Thermal Knives Deployment Driver 1	Support 4 mechanisms with ARM & FIRE @ 20 V, 8 A
Frangibolt Deployment Driver 2	Support 4 mechanisms with ARM & FIRE @ 22 ~ 36 V, 2 A
Solar Array Voltage	42 ~ 100 V
Battery Discharging Current	Up to 130 A
TC/TM	Redundant CAN bus to OBC
Separation Switch from Launch Vehicle	Triple redundancy

Dimensions & Mass	
Mass	24.5 kg (with current configuration)
Volume	453 x 340 x 279 mm <sup>3</sup> (with current configuration)

Environments	
Thermal	- 20°C to 60°C operating range
Radiation	TID: 20 kRAD SEE: 40 MeV·cm <sup>2</sup> /mg
Lifetime	5 years
EMI/EMC	MIL-STD-461