



TakeMe2Space

PowerDrive

Technical Specifications



Description:

PowerDrive is an electrical power supply (EPS) designed for use in 2U to 16 U cubesats. The system integrates solar power conditioning and power distribution into a compact PC104 compliant aluminium enclosure. There are 3 independent MPPT enabled channels for solar power collection that support 4 solar panel inputs. There are 6 independent DC-DC converters which can be configured for different output levels, depending on the bus and payload requirements. There are 10 output connectors for sub-system power and 6 outputs for deployment systems in addition to the PC104 header. A low power STM32 microcontroller controls the system inputs, outputs, batteries, and provides telemetry through isolated CAN and RS485 interfaces. The built-in hardware watchdog ensures reliability during long-duration missions. PowerDrive can be connected to up to 6 PowerBank-50 battery packs, for a total energy storage capacity of over 300 Wh.



Specifications:

	Parameter	Value
Input Solar Power	Independent Input Channels	3 x fast response MPPT channels
	Total solar panel inputs	4 connectors (2 inputs share an MPPT channel)
	Input Voltage Range	6 - 35 V
	Peak Input Current	3 A per channel
	Peak Input Power	60 W per channel; 150 W overall
Output Power	DC Converters	3 x 5 V buck converters (configurable 3.3 to 12 V) 2 x 12 V buck converters (configurable 3.3 to 12 V) 1 x 12 V buck-boost (configurable 3.3 to 24 V)
	Output Connections	Individual connectors: 5 x 12 V outputs (configurable) 5 x 5V outputs (configurable) PC104: 2 x buck-boost outputs 12 x buck outputs 2 x V_raw outputs
	Peak Current per output channel	Up to 6 A per individual channel
	Overall Peak Power Output	100 W
Deployment Outputs	Deployment Outputs	6 x deployment connectors
	Output voltage	Default: 5 V (configurable 3.3 to 12 V)
	Maximum power	30 W for <5 seconds
System	Bus Voltage	12 - 20 V (with 4S1P pack config.)
	Processor type	Single Core 32-bit Arm Cortex-M33 MCU
	Memory	16 MB Serial Flash
	MCU Power Supply	Dual-redundant independent 3.3 V supply
	Real-Time Clock (RTC)	RTC with battery backup
	Fault Tolerance	External Watchdog Timer (configurable)
	Power Consumption	0.5 W nominal, 1 W peak
Interfaces	Interfaces Supported	1 x isolated CAN 1 x isolated RS-485 (full or half duplex)
	Electrical Inhibits	1 x Deployment Switch (DSW) connector (NO logic) 1 x Remove-Before-Flight (RBF) (NO logic)
	Connectors	1 x PC 104 Header 10 x Harwin Gecko-SL (6 pin)



		6 x Molex Pico-Lock (2 mm pitch, 3 pin) 2 x Molex Pico-Lock (1.5 mm pitch, 6 pin) 4 x Molex Pico-Lock (2 mm pitch, 2 pin) 2 x Molex Pico-Lock (2 mm pitch, 4 pin) 1 x Molex Pico-Lock (2 mm pitch, 6 pin) 1 x Harwin Gecko-SL (26 pin)
Mechanical	Dimensions	95.5 x 90.5 x 31.8 mm
	Weight	300 g
	Form factor	PC104 compliant with stackable connector
	Enclosure Material	Type III anodised Al 6061-T6
	Temperature Range	-40°C to +85°C
	Storage Temperature	-55°C to +85°C
Telemetry	Solar Panel Input Voltage x 3	
	Solar Panel MPPT Voltage x 3	
	Solar Panel Input Current x 3	
	MCU Temperature	
	Bus Voltage	
	Bus Current	
	Regulated Power Output Current x 10	
	Regulated Output Current x 5	
	Battery Telemetry (if Battery Pack is compatible)	
Software	Software Development Kit (SDK)	SDK will be provided
	Supported Languages for SDK	C - Language
Testing & compliance	ETL: TVAC, EMI/EMC, Vibration and Shock Tolerance	TBD
	Mission Life Expectancy	5 Years



Simplified Block Diagram:

