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Airbus Crisa designs and produces state-of-the-art electronic products for space applications that range from satellites, deep space probes and orbital infrastructure to space transportation systems. From ensuring proper on-board temperatures, energy management, and providing the delicate control for spacecraft and launchers, Airbus Crisa's innovative solutions build on the company's heritage in almost all types of electronics with the highest precision and performance.

Motivated by a commitment to continuous innovation, and backed by the strategy of investments in research and development, the company's products continually evolve in response to customer's needs.
Airbus Crisa has proven its ability to meet requirements for all types of missions, equipping everything from large telecommunication satellites, new-space constellations and agile Earth observation platforms to scientific and deep space exploration probes.

AIRBUS

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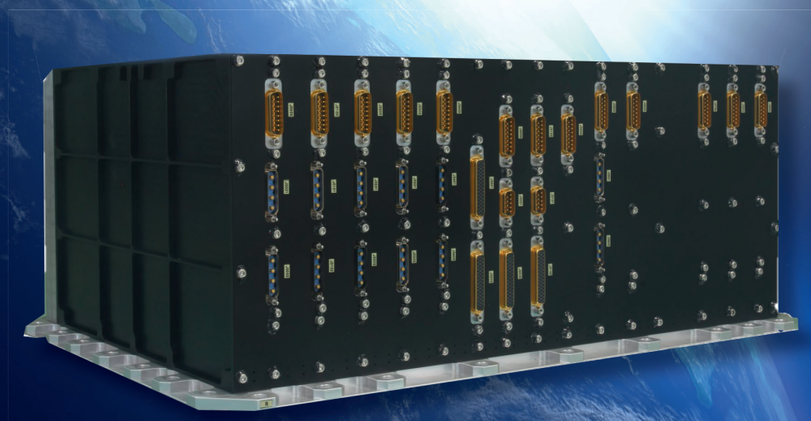
Reference 0261_24_1.

CRISA

MVPCU

Power Conditioning Unit
for Multivoltage
Power Applications



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MVPCU

Main Features

- Accommodation of the Solar Array power generation during sunlight periods, and Battery power during Eclipse periods, generating a main regulated output bus of 100V, and Secondary Regulated Bus Voltages (two different voltage levels as an option).
- Battery Charge Management (256 programmable charge current levels). The EOC management shall be performed externally to allow custom control strategies.
- Communication to the on board computer:
  - Using MILBUS 1553B I/F.
  - Direct TM/TC.
- Interface using straps for different operative scenarios to enable the possibility to launch the unit in OFF mode.

Environmental

- Temperature: [-30°C to +65°C].
- Radiation: compatible to GEO.
- Life: 15 years.

Main Applications fields

Designed for Geostationary Earth Orbits, Scientific and Telecom missions

MVPCU provides unprecedented performances, thanks to the use of state-of-the art technologies as GaN and digital control. In particular, it offers high power density and high efficiency.

MVPCU highlights:

- **TRL8 maturity level.**
- **GaN based DET solar array energy management concepts.**
- **Main power bus regulated at 100V.**
- **Up to two secondary voltage buses configurable from 10V to 90V to accomplish the mission needs.**
- **Fully compatible with 15 years GEO missions.**
- **Scaled from 2 kW to 26 kW.**
- **Fully digitalized controlled of MVPCU with reprogrammable devices even with totally integrated.**

Interfaces

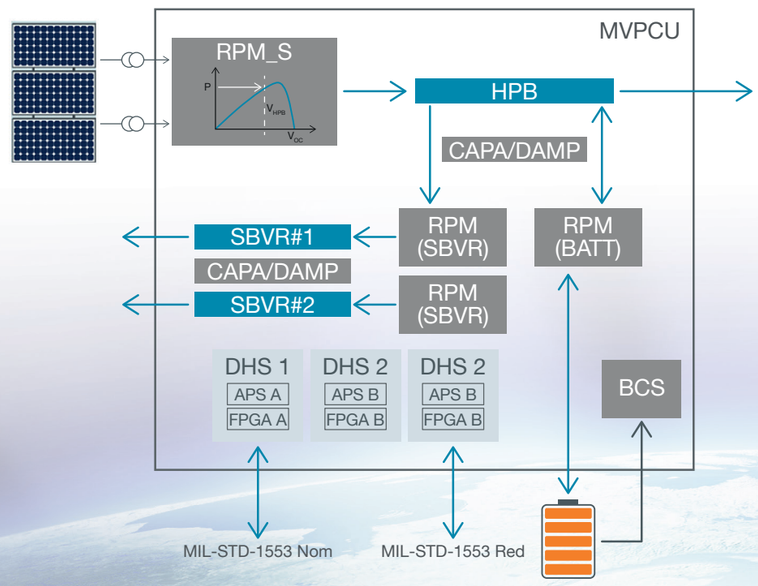
- Power buses:
  - High Power Bus (HPB): 100 V
  - Regulated Secondary Bus #1 (RSB#1)
  - Regulated Secondary Bus #2 (RSB#2)
- Interface with avionics based on MIL-STD-1553 plus direct TM/TC lines.
- Battery: LI-Ion between 60V and 90V plus voltage and current sense signals.
- Solar array connection compatible with 100V bus.
- Direct TC up to 32 (14V / 50 ms)
- Strap I/F

Key Figures

- Dimensions depending on mission specific needs (length x width x height)As a reference for the modularity:
  - HPB=20 kW @100 V
  - RSB=4 kW @ 28 V
  - UMB=18 kW @ 60 V

The physical characteristics:
528 x 380 x 209 mm and 37 Kg

- Efficiency:
  - Solar Array Power Regulation: > 98%.
  - Battery Management (regulated bus) : @ VBATT=80V > 97.5%.
  - Secondary voltage regulated bus:
    - 28V: >93%
    - 60V: >97%



Each Reversible Power Modules (RPM) can mount up to 12 reversible power converters (RPC) configured for three different applications:

- RPC_S : Solar Array Reversible Power
- RPC (SBVR) : RPM for Secondary Bus Voltage Regulator
- RPC (BATT) : RPM for Battery

Function	Parameter	Performances
Data Handling Subsystem interface	Number of MIL-1553 Bus Interfaces	2 (Nominal + Redundant)
	Number of MIL-1553 ON/OFF CMD	1 x N + 1 x R
	Direct TC Lines note1	32 (14V / 50ms pulse time)
	Launch off STRAP	2 out of 3 majority voter
	Number of boards per unit	3
Solar Array (RPC_S)	Redundancy scheme	M+1 concept at card level, no loss of solar array section after single failure.
	Maximum current per section	22 A
	Maximum open circuit voltage - VOC	Clamped by HPB (DET)
	Number of independent SA sections per RPM	2 (3x RPC per section)
	Efficiency	> 98%
	Number of boards per unit Note2	Up to 15, Depend on the power demanded
Battery (RPM (BATT))	Redundancy scheme	M+1 concept at card level no Battery power loss after failure
	Maximum BCR battery current per RPM board	45 A @VBAT=80V
	Maximum Number of RPCs per RPM	6
	Efficiency BCR	> 97.5% @VBAT=80V
	Number of boards per unit Note2	Up to 15, Depend on the power demanded
Secondary voltage (RPM (SBVR))	Redundancy scheme	M+1 concept at card or function level no SBVR power loss after failure
	Output voltage	10V to 90V
	Maximum Number of RPCs per RPM	9
	Maximum output current per RPC	5.5 A
	Efficiency	> 94.2% @28V > 97.3% @63V
	Number of boards per unitNote2	Up to 5, Depend on the power demanded
Battery Cell Scanner (BCS)	Maximum number cells sensed	Up to 23
	Battery Voltage sensing lines	3 (ACT & RTN)
	Battery Current sensing lines	3 (ACT & RTN)
	Number of boards per unit	1
Capacitors Damping (CAPA-DAMP)	Maximum capacitance per board	2.4 mF (4 groups of 600uF)
	Maximum capacitance per branch	600 uF
	Bus damping	Up to 600 uF + 0.1 ohm
	Number of boards per unit	Depend on the power demanded.

Note1: Only if there is one RSB=28V

Note2: The maxmum number of RPM modules is 15 and the converter distribution (S, BATT or SBVR) depend on the power necessity among buses.