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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.

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CRISA

EVO PCDU

Power Conditioning and
Distribution Unit for Small and
Medium Power Applications



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EVO PCDU

Main Features

- Mechanical envelope compatible with most platforms on the market.
- Built-in Launch-off capability.
- Built-in EOL passivation in line with ‘green space’ regulations.
- Deployment module single design to handle both EED and/or LSRU.
- Solid-state based battery switch.
- No more than one Latching Current Limiter lost after any single failure.

Key Figures

- Dimensions depending on mission specific needs (length x width x height):
 - “Small unit” – 8 modules: 262 x 350 x 210 mm
 - “Big unit” – 20 modules: 650 x 350 x 210 mm
- Efficiency:
- Solar Array Power Regulation:
 - Direct Energy Transfer: > 98.5%.
 - MPPT - Silicon-based: > 95%.
 - MPPT - GaN-based: > 98%.
- Battery Management (regulated bus):
 - BCR > 95%.
 - BDR > 94%.
- Distribution: > 99%.

EVO is a state-of-the-art PCDU product based on a flexible modular concept. It is the solution of choice for application in a wide range of power and mission scenarios. EVO PCDU offers in one equipment both major functionalities of an Electrical Power Subsystem:

- **The Power Conditioning part (PCU) in charge of the spacecraft energy sources management.**
- **The Power Distribution (PDU) covering the switched and protected power distribution towards the users.**

EVO highlights:

- **TRL9 maturity level.**
- **DET or MPPT (Si and GaN)**

Solar array energy management concepts:

- **Supports unregulated (battery follower) and fully regulated primary bus rail architectures.**
- **Conditioning and distribution capabilities adaptable according to mission needs.**
- **SBVR card for secondary regulated 100 V bus capability.**

Interfaces

- Power bus: Primary 28 V battery follower or regulated + Secondary 100V regulated.
- Interface with avionics based on MIL-STD-1553 plus direct TM/TC lines.
- Battery: LI-Ion, solid-state based battery switch.
- Distribution:
 - Latching Current Limiters (LCL), some with additional series switch (Safe-Off capability).
 - Auto-rearm Current Limiters for vital loads.
 - Heater Control Switches upstream protected by LCLs.
 - Deployment devices driving: EED and LSRU.

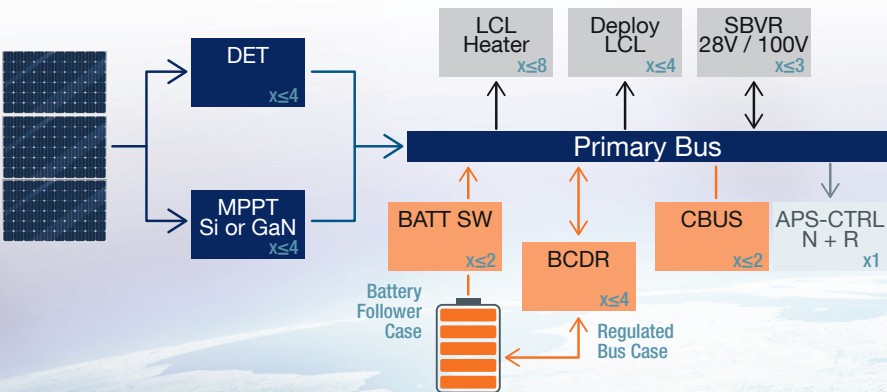
Environmental

- Temperature: [-35°C to +70°C].
- Radiation: compatible to LEO & Interplanetary
- Life: 15 years.
- Distribution: > 99%.

Main Applications fields

Designed for Low and Medium Earth Orbits, Scientific and Interplanetary missions.

Technical diagram



Function	Parameter	Performances
Data Handling Subsystem Interface	Number of MIL-1553 Bus Interfaces	2 (Nominal + Redundant)
	Number of master Direct Switch Off Lines	1 x N + 1 x R
	DOC (Direct On Command) Lines	1 x N + 1 x R
APR DET version Direct Energy Transfer (S3R)	Redundancy scheme	M+1 concept at card level no SA power loss after failure
	Maximum current per section	9.5 A
	Maximum open circuit voltage - VOC	Clamped by power bus
	Number of independent sections per card	6
	Maximum number of cards	4
	Efficiency	> 98.5%
APR MPPT version Silicon-based	Redundancy scheme	M+1 concept at card level no SA power loss after failure
	Maximum output current per section	7 A
	Maximum open circuit voltage - VOC	≤ 85 V
	Number of independent sections per card	5
	Maximum number of cards	4
	Efficiency	> 95%
APR MPPT version GaN-based	Redundancy scheme	M+1 concept at card or function level no SA power loss after failure
	Maximum output current per section	20 A
	Maximum open circuit voltage - VOC	≤ 110 V
	Number of independent sections per card	3
	Maximum number of cards	4
	Efficiency	> 98%
Battery Interface (battery follower version)	Maximum Charge / Discharge Current	≤ 130 A
	Number of End Of Charge Voltage Levels	16
	Number of Charge Current Limit Levels	16
	Battery tapering control	Yes
	Launch Off capability	Yes
	End of life passivation	Yes
BCDR Battery Charge / Discharge Regulator (regulated bus version)	Number of BDR per BCDR card	2
	Battery Discharge power per BDR converter / BCDR card	600 W / 1200W
	BDR efficiency	> 94%
	Number of BCR per BCDR card	2
	Battery Charge current per BCR converter / BCDR card	6.75 A / 13.5 A
	BCR efficiency	> 95%
	Redundancy scheme	M+1 concept in hot redundancy at function level
	Number of End Of Charge Voltage Levels	16
	Number of Charge Current Limit Levels	16
	Battery switch for regulated bus version	Distributed among BCDR cards
SBVR 28 V / 100 V Secondary bus (bidirectional)	Number of converters per SBVR card	3
	100 V secondary power per SBVR converter / SBVR card	250 W / 500 W
	Low voltage side	22 V – 37 V
	High voltage side	100 V
	SBVR efficiency	> 91%
	Redundancy scheme	M+1 concept in cold redundancy at function level – ladder architecture
Distribution LCL	Maximum number of LCL	Up to 144
	Maximum number of Auto-rearm LCL	Up to 24
	Maximum number of Heaters	Up to 256
	Type of Limiters available	LCL / Safe-Off LCL / Auto-rearm LCL
	LCL classes available (Amp)	0.5 - 1 - 2 - 3 - 4 - 5 - 6 – 8 – 10
	Auto-rearm LCL classes available (Amp)	0.5 - 1 - 2 - 3 - 7
Deployment	Type of devices supported (same card)	EED / LSRU (non-explosive)
	Maximum number of devices	48 N + 48 R
	Safety Deployment Strap	Yes
	Architecture	Triple barrier Arm / Select / Fire