AIPCS Controller

Powering AI & hyperscale infrastructure.
Millisecond-level load compensation.
Energy exchange management.
Grid code compliance.



Advanced control solution for AI Data Centers, powered by the Power Electronics Power Plant Controller platform.

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MECHANICAL DATA	Material	Steel
	Installation	Wall- or floor-mounted [1]
	Cable entry	Bottom entry and exit
	Maintenance	Front access required
	Cooling	Forced ventilation
	Weight [2]	85 kg / 188 lbs (base PPC-family enclosure)
	Dimensions [WxDxH] [2]	1000 × 845 × 300 mm / 40 × 33.27 × 12 in
ELECTRICAL DATA	Maximum power consumption	230 W
	AC input voltage	230 Vac (IEC) [±10%], 120 Vac (UL) [±10%]
	DC input voltage	120 - 290 Vdc
	Input frequency	50/60 Hz
COMMUNICATIONS	Compatible BESS inverters	PCSM, PCSK, Multi PCSM, Multi PCSK
	Supervision protocols	Modbus TCP / ADS, for inverter control and BCI reporting
	Fast control network	High-speed cyclic setpoint distribution to the inverter
	Communication switch	8 RJ45 ports + 2 optional single-mode or multimode fiber-optic transceivers
	Load Sensing response time [3]	< 25 ms from a sudden load rise/drop to the moment the BESS reaches the requested operating point (~50 µs fast-metering sampling; ~200 µs Load Sensing scan rate)
ENVIRONMENTAL CONDITIONS	Temperature range	From -25 °C to +50 °C
	Humidity	5% to 95%, non-condensing
	Degree of protection	IP54 / NEMA 12
	Pollution degree	PD3
	Maximum altitude	4000 m / 13123 ft
	Impact protection	IK10
STANDARDS	Marking	CE
	Standards	UL 6200 / IEC 61010-1 / UL 3141
FUNCTIONALITIES	General	The AIPCS Controller is a variant of Power Electronics' Power Plant Controller platform. In the FreePuls solution, the fast load compensation is merged internally with standard BESS plant control (power limits, plant balancing, charge/discharge scheduling) into a single combined inverter setpoint.
	Active power control	In the FreePuls solution, the active power setpoint is determined based on the magnitude of the load oscillation and the current plant operating conditions, including inverter availability, battery availability and power capability, and estimated plant losses.
	Reactive power control	Reactive power or voltage control at the POI remains available simultaneously with active power control/fast load compensation.
	Diagnostic functions	Warning/fault messages, real-time data monitoring, plant phasor operation diagrams, and O&M diagnostics.
	Others	Collects availability data (available power per power block, derating indicators) from BCIs via the standard supervision channel (e.g., ADS) to correctly allocate the corrective action across inverters and to provide maximum/minimum power boundaries for coordinated operation. Manages multiple storage inverters, SOC balancing, P/Q plant limitations, hot standby redundancy, controlled plant start, individual inverter control, line drop compensation, and security processes when plant failures occur.
OTHERS	Web server	For local and remote monitoring and control.
	Customizable solution	Flexible solution built on the same modular, programmable controller platform shared with the PPC PRO / BPC PRO / HPC PRO family.

NOTES

[1] If floor installation is required, an optional plinth must be added.
[2] Weight and dimensions correspond to the base PPC-family enclosure; they may vary depending on the specific solution.
[3] Estimated response time based on the system design target; actual performance depends on network topology, grid conditions and inverter configuration.

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