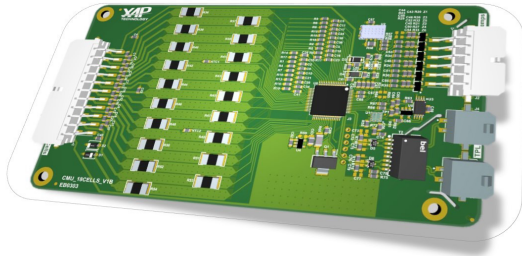


# CMU-118



## PRECISION AND SAFETY AT THE HEART OF YOUR BATTERY

The XAP CMU is the cornerstone of battery management, monitoring and balancing each cell with precision while securely transmitting data to the BMU.

Its modular and scalable design adapts to anything from compact 48 V batteries to high-voltage packs up to 800 V, with no hardware changes required. Each unit operates autonomously, with built-in acquisition, regulation, and diagnostics.

Built on motorsport engineering principles, the CMU delivers robustness, compactness, and rapid response. Redundant measurements, traceable configurations, and isolated CAN interfaces ensure continuous operation even under extreme conditions.

**CMU-118:** 18-cell extension, passive balancing, TPL bus, addressing via internal bridges, same galvanic isolation logic.



## METROLOGICAL RELIABILITY, GALVANIC SAFETY, OPERATIONAL MODULARITY

### ISOLATED CELL VOLTAGE:

Filtered and oversampled channels with integrated micro-controller

### TEMPERATURE MONITORING:

6 NTC inputs + 2 internal sensors, digitally calibrated.

### PRECISE MONITORING:

Accurate cell voltage and temperature measurement with passive balancing

### ISOLATED COMMUNICATION:

Galvanic CAN/TPL up to 3000 V, with ESD protection and common-mode filters.

### DATA STORAGE:

Serial number, hardware configuration, and calibration parameters

### AUTOMATIC IDENTIFICATION:

Dynamic addressing for easy wiring and in-field reconfiguration

### SAFETY & SELF-CHECK:

Closed-loop control (pumps, valves, fans, heaters).

### HIGH-VOLTAGE READY:

Supports multi-module systems up to 800 V

### VERSATILE APPLICATIONS:

Ideal for industrial batteries, heavy retrofit, marine, and utility vehicles

### RELIABLE & DURABLE:

Built-in diagnostics ensure system continuity and long-term stability.



► ELECTRICAL SOLUTIONS & POWERTRAIN:: **CMU-118**

### FUNCTIONAL OVERVIEW

Voltage measurement	18 channels (0 – 5V each). 16-bit ADC, $\pm 2$ mV precision. Total module voltage 60V. Galvanic isolation 3 kV.
Voltage range	0 – 5V per cell / 72V total
Temperature monitoring	6 external NTC + 2 internal sensors ( $-20$ to $+80$ °C). Monitors cell blocks and PCB temperature.
Balancing method	Passive resistive balancing ( $\approx 4.7 \Omega / 3$ W per cell). Controlled MOSFETs ensure stable dissipation.
Balancing algorithm	Sequential and selective discharge of higher-voltage cells. Target $\Delta V < 25$ mV between cells.
Microcontroller	Microcontroller handling acquisition, balancing control, and bus communication.
Memory & traceability	EEPROM for identification, calibration data, and event logs.
Power supply	DC BUS input
Communication	1 isolated TPL bus (Texas Instruments protocol) with CRC + watchdog.
Isolation	3000V galvanic separation (logic / cell domain / communication).
Protections	Reverse polarity, ESD suppression, open-wire detection, and transient overvoltage protection.
Diagnostics	Start-up self-test, CRC, watchdog, fault flags

### ENVIRONMENT & COMPLIANCE

Operating T° range	$-40$ °C to $+85$ °C
IP Rating	IP40 (bare board)
Vibration/shock	Automotive-grade (IEC 60068-2-6 / -27)
EMC/CEM	Compliant with UNECE R10 / ISO 11452 standards
Safety standards	ISO 26262 ASIL-B (CMU level) / UNECE R100 / R136 compliant
Reliability	$> 13\,000$ h continuous operation
Maintenance	Calibration and firmware update via CAN or USB interface

### MECHANICS

Dimensions	127 × 70 × 10 mm
Weight	$\approx 30$ g

### REFERENCE

PS0549	CMU-118
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