Power Distribution Box (PDB – UXOR)

Model Number: THRSLPDB1001

Overview

The **Power Distribution Box (PDB – UXOR)** is a standard THRSL product designed for reliable power delivery and subsystem protection in robotic and defense applications. It supports **dual DC input for redundancy**, integrates a **battery monitoring system (BMS)**, and distributes both **24V and regulated 12V outputs** to critical subsystems.

With solid-state relay (SSR) control, modular connectors, and built-in protection, the PDB ensures stable and safe operation. Proven in the **UXOR project supplied to the Indian Air Force (IAF)**, it demonstrates rugged performance in mission-critical environments.

Technical Specifications

Parameter	Specifications
Input Voltage Range	20V – 30V
Output Voltage	Same as input; regulated 12V
Maximum Load Current	30A @ 24V, 16A @ 12V
BMS Capacity	100A load monitoring, 50A charging monitoring
Relays	3 × Solid State Relays (controlled by BMS)
Protection Features	MCB overcurrent protection, remote shutdown/reset via low-frequency modem
Connectors	Modular MIL-grade connectors for input, output, payload, BMS, charging
Charging Interface	Direct charger connector
Switch	SPDT switch for activation
Protection Standard	IP65

Operating Temperature	-20°C to +55°C

Key Features

- Dual DC input for **redundant power reliability**
- Integrated **Battery Monitoring System (BMS)** for current tracking
- 24V distribution with regulated 12V output
- Solid-state relay switching for safe and reliable control
- Built-in overcurrent and MCB protection
- Modular MIL-grade connector interface for **plug-and-play integration**
- IP65-protected and qualified for harsh environments

Applications

- Power distribution for robotics and automation platforms
- Defense-grade mobile robotic systems
- Carrier vehicles and command systems
- UXOR platform subsystem power management (**field-proven in IAF deployment**)

Compliance

Environmental Qualification (JSS 55555)

Sr. No.	Standard	Compliance Details
1	Vibration (Test 28)	Ground equipment in tracked vehicle, 5–13 Hz: ±6 mm, 13–500 Hz: ±40 m/s², 1 hr cumulative (all axes)
2	Temperature Cycling	-20°C to +55°C, dwell time 60 min, 14 cycles
3	Random Vibration	Same as above (all three axes)
4	High Temperature (Test 17)	55°C ± 3°C for 16 hrs, followed by storage at 75°C ± 3°C for 24 hrs
5	Low Temperature (Test 20)	-10°C ± 3°C for 16 hrs
6	Tropical Exposure (Test 27)	14 cycles from 20°C to 45°C (RH 95%)
7	Bump (Test 5)	4000 bumps @10g, 2–3 bumps/sec, pulse width 16 ms
8	Rain (Test 12)	4 shower heads @45° directed at corners
9	Corrosion – Salt Fog (Test 9)	Enclosure, PCBs, painted parts
10	Corrosion – Acid (Test 7)	Enclosure, PCBs, painted parts
11	Dust (Test 14)	Equipment in unpacked, switched-off condition
12	Mould Growth (Test 21)	On PCBs, insulation, rubber, gaskets, plastics, polymers, textiles

EMI/EMC Compliance (Defense Standards)

Sr. No.	Standard	Compliance Details
1	CE 102	Conducted emissions, power leads, 10 kHz to 10 MHz
2	CS 101	Conducted susceptibility, power leads, 30 Hz to 150 kHz
3	CS 114	Conducted susceptibility, bulk cable injection, 10 kHz to 200 MHz
4	CS 115	Conducted susceptibility, bulk cable injection, impulse excitation
5	CS 116	Conducted susceptibility, damped sinusoidal transients, 10 kHz to 100 MHz
6	RE 102	Radiated emissions, Electric Field
7	RS 103	Radiated susceptibility, Electric Field, 2 MHz to 40 GHz
8	PBESD	Personnel Borne Electrostatic Discharge

Note

The **Power Distribution Box (PDB – UXOR)** is part of **THRSL's standard technology suite**, designed for **plug-and-play deployment** across industries. Its proven use in the **UXOR project for the Indian Air Force (IAF)** demonstrates its robustness and adaptability in mission-critical environments.

Custom variants can be developed to support higher load capacities, additional inputs/outputs, or specific connector requirements.