REDLER
TECHNOLOGIES

WHITE PAPER

Power Rider Product Family

Enhancing Power Efficiency in Combat & Military Vehicles

www.redlertechnologies.com

WRITTEN BY:
Rakel Madar

ABOUT REDLER TECHNOLOGIES

Redler Technologies specializes in advanced power distribution solutions for military, defense, and high-reliability applications. By pioneering electronic smart circuit breaker technology, Redler provides cutting-edge solutions for mission-critical vehicle power systems.

ABSTRACT

Military and combat vehicles operate in **high-risk, extreme environments** where reliability, efficiency, and survivability are paramount. Traditional power distribution systems rely on bulky, failure-prone mechanical relays and circuit breakers, which hinder performance and add unnecessary weight. The Power Rider Product Family, built on **Electronic Smart Power Distribution Module (eSPDM) technology**, provides **unmatched power management** capabilities by reducing wiring complexity, increasing operational reliability, and enabling real-time diagnostics. This paper explores how Power Rider seamlessly integrates into combat vehicles and offers superior power distribution solutions tailored to military needs.

INTRODUCTION

Combat and military vehicles, including tanks, armored personnel carriers (APCs), and command & control vehicles, require advanced power distribution systems to operate communications equipment, weapon systems, sensor arrays, and electronic countermeasures. Existing mechanical-based power systems are prone to failures due to shock, vibration, and thermal stress, leading to increased maintenance downtime and mission risks.

The Power Rider Product Family is an innovative solid-state power distribution system that eliminates these vulnerabilities by integrating smart circuit breakers, real-time monitoring, and automated power management into a single compact unit.

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KEY FEATURES AND BENEFITS OF POWER RIDER FOR OFF-ROAD APPLICATIONS

Intelligent Power Distribution & Enhanced Safety

In modern combat scenarios, reliable electrical power management is critical. The Power Rider system offers real-time load balancing, predictive diagnostics, and rapid short-circuit response, significantly enhancing vehicle resilience.

- Arc Detection & Fire Prevention: Power Rider prevents electrical arcs, a leading cause of vehicle fires, through instantaneous fault isolation.
- Automatic Power Prioritization: Ensures that critical systems like fire control, navigation, and life support receive uninterrupted power during high-stress situations.
- Short-Circuit Protection: Power Rider's electronic circuit breakers detect faults and isolate failures within microseconds, preventing system-wide disruptions.

Weight Reduction & Improved Fuel Efficiency

Combat vehicles must balance armor protection with mobility. Traditional electrical harnesses add significant weight, impacting fuel efficiency and maneuverability.

- Up to 90% reduction in wire weight
- Elimination of mechanical relays and fuses, reducing overall system complexity
- Compact and modular design, freeing up valuable onboard space

Scalability Across Military Platforms

Power Rider is designed to adapt seamlessly across different military vehicle classes:

- Main Battle Tanks (MBTs) & Infantry Fighting Vehicles (IFVs) – Supports high-power weapon and defense systems.
- Armored Personnel Carriers (APCs) & Tactical Vehicles – Enhances electronic countermeasures and communication systems.
- Special Forces & Reconnaissance Vehicles – Enables stealth operations with silent power management and low heat signature.

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Mission-Critical Diagnostics & Maintenance

Traditional power systems require manual inspection, increasing maintenance burdens. Power Rider offers automated real-time diagnostics, reducing vehicle downtime.

- Built-in telemetry for remote monitoring
- Predictive maintenance alerts, reducing failure rates
- Data logging for mission debrief and post-action analysis

Designed for Extreme Environments

Combat vehicles must withstand harsh terrains, electromagnetic interference (EMI), and battlefield conditions. Power Rider is built to meet and exceed military-grade specifications.

- Ruggedized, IP65-rated enclosures for water, dust, and impact resistance
- Operating temperature range: -40°C to +85°C
- MIL-STD-810G compliance for shock and vibration resistance

CASE STUDY: POWER RIDER IN ARMORED MILITARY VEHICLES

A leading defense contractor integrated Power Rider into its next-generation armored personnel carrier (APC), addressing frequent electrical failures and excessive wiring weight. The results included:

- 50% reduction in electrical failures due to enhanced circuit protection
- 30% weight reduction, improving vehicle mobility
- 20% improvement in fuel efficiency, leading to extended mission range
- Enhanced operational readiness, with predictive fault detection reducing downtime

These findings underscore Power Rider's potential to revolutionize military vehicle power distribution.

CONCLUSION

The Power Rider Product Family is the next-generation power management solution for combat and military vehicles. By replacing traditional, failure-prone mechanical power systems with intelligent solid-state modules, Power Rider enhances vehicle survivability, operational efficiency, and safety. With its proven weight reduction, real-time diagnostics, and ruggedized durability, Power Rider ensures that military forces have the power they need to complete their missions successfully.

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