



Engine Start Module

SAFETY FIRST:

How ESM Reduces Risks in Mining Operations

Safety is non-negotiable in mining. Equipment failures during critical operations can lead to hazardous situations, costly downtime, and increased risk to personnel. One of the most overlooked safety threats? Battery-related start failures. PMP Group's Engine Start Module (ESM) eliminates this risk by ensuring reliable starts every time—while reducing the number of batteries required to operate heavy equipment.

THE HIDDEN SAFETY RISK: BATTERY FAILURE

Mining equipment often operates in **active mining areas where breakdowns can create serious hazards**. Battery-related start failures increase the likelihood of:

- **Stranded equipment in high-risk, exclusion zones** such as haul roads, highwalls, or blast areas
- **Manual jump-starting under dangerous conditions**

These scenarios expose workers to unnecessary risk and disrupt safe operations.

INTRINSIC HAZARDS OF LEAD-ACID BATTERIES

Lead-acid batteries introduce safety risks during normal use and charging:

- **Explosion Risk:** Charging produces hydrogen gas. In confined compartments, gas buildup combined with a spark can cause an explosion.
- **Chemical Hazards:** Sulfuric acid leaks can cause burns and environmental contamination.
- **Electrical Hazards:** High current during cranking and charging increases the risk of short circuits and arc flashes.

These hazards exist even before considering manual handling or replacement.

- **Battery Replacement Risks:**

Every battery change involves lifting and maneuvering heavy batteries in confined spaces.

For example: An 8D lead-acid battery used in mining dump trucks weighs **130–150 lbs (59–68 kg)**.

Handling these batteries increases:

- **Musculoskeletal injury risk**
- **Crush hazards**
- **Acid spill exposure**

By reducing the number of batteries required for reliable starts, ESM minimizes these risks and lowers the frequency of changeouts.



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TECHNICAL CAUSES BEHIND SAFETY RISKS

- **Voltage Drops:** During cranking, low voltage can disrupt critical electronic systems.
- **Deep Discharge:** Leads to battery failure at the worst possible time.
- **Component Stress:** Starter motors and alternators fail under repeated strain, increasing breakdown risk.

CONSEQUENTIAL SAFETY HAZARDS

- **Manual Intervention:** Jump-starting or battery replacement in active mining areas exposes workers to moving equipment and environmental hazards.
- **Operational Delays:** Equipment stuck on haul roads or near blasting zones creates traffic and collision risks.

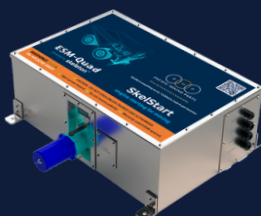
How ESM Improves Safety

- **Reliable Starts Every Time:** Ultracapacitor technology ensures instant cranking power—even if batteries are weak.
- **Fewer Batteries Required:** ESM reduces battery count, meaning fewer heavy lifts and less exposure to chemical hazards.
- **Eliminates Jump-Start Risks:** No need for manual intervention in dangerous areas.
- **Protects Electrical Systems:** Stable voltage during start prevents ECM faults and sensor failures.
- **Reduces Breakdown Frequency:** By preventing deep discharge, ESM minimizes component stress and unexpected failures.
- **Supports Emergency Readiness:** Critical equipment starts on demand, reducing risk during fire, flood, or evacuation scenarios.

*Safety starts with reliability. **PMP Group's ESM eliminates battery-related start failures**, reduces intrinsic battery hazards, and minimizes manual handling risks—**keeping your fleet ready when it matters most.***

BOOST PRODUCTIVITY & PROTECT YOUR PROFIT

- ✓ Maximum Efficiency & Reliability
- ✓ Lower Operating Costs
- ✓ Reliable +1 million cycle duty life
- ✓ Commitment to Sustainability



Contact us today!

Learn how ESM delivers reliability that pays off your operations with PMP ESM and boost your fleet's efficiency

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