



PMP GROUP

Engine Start Module

Starts every time



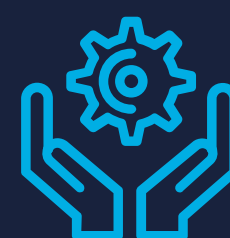
**Revolutionising
Heavy Equipment
Productivity**



SAFETY FIRST



INCREASE
PRODUCTIVITY



REDUCE
WASTE & CO2



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The PMP Engine Start Module

Uses a hybrid solution of ultracapacitors and auxiliary batteries to optimum starting performance and life.

Designed by PMP for sturdiness, reliability, and safety for applications in the mining industry.



Why choose PMP ESM?

Technology

In collaboration with the German company **Skeleton Technologies**, our ESM solution incorporates Skelstarts ultracapacitors, guaranteeing reliability and outstanding performance in mining machinery.

Design

Designed to integrate with existing battery systems, **the ESM can be customised** to your site requirements and environmental conditions.

Applications

- Dump trucks
- Water Carriers
- Drill rigs
- Excavators
- Front-end loaders
- Motor graders
- Drainage pumps
- Generators
- Other Diesel equipment

powered by
skeleton⁺

Skelstart Engine Start Module

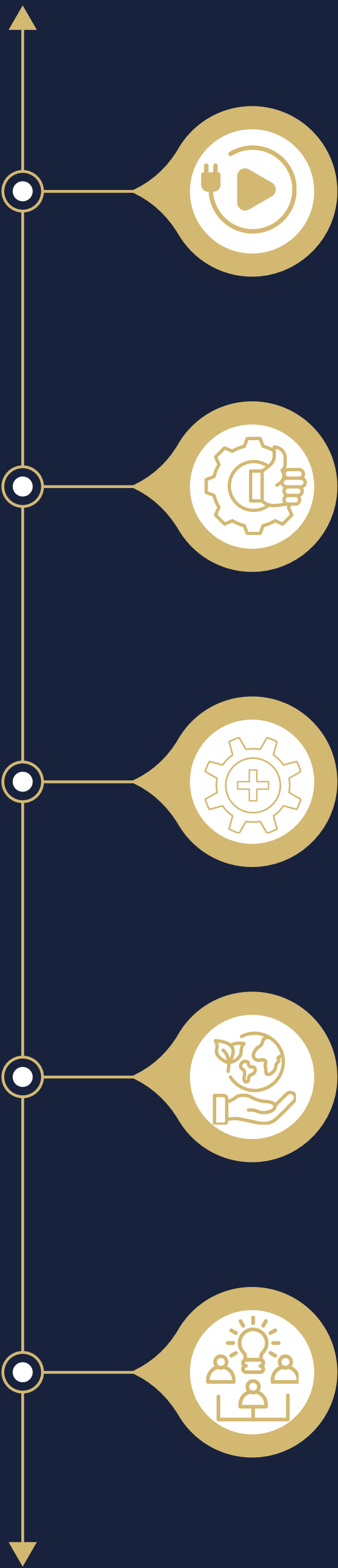
Advanced ultracapacitor technology



Skelstart

- The **SkelStart 24V** by **Skeleton** Technologies uses ultracapacitors for reliable engine starts.
- **Designed to operate in harsh conditions**, with a temperature range of -40 °C to +65 °C.
- Fully recharges in just 20 minutes, with a capacity of **340F** and a weight of **8.5 kg**.
- **Resistant to vibration and shock**, making it suitable for trucks, buses, heavy machinery, and railway systems.
- Uses carbon-based ultracapacitors that are **100% recyclable**, extending the device's lifespan and reducing electronic waste.
- Its high energy efficiency helps **lower CO₂ emissions**, reducing the environmental impact with every start.

The **PMP ESM** is a robust, reliable, and safe solution that outperforms batteries.



PLUG & PLAY

- Designed for all HME.
- Integrates to existing battery location or custom designed.

01

STARTS EVERYTIME

The PMP ESM's lifespan extends beyond the vehicle life, ensuring operations continue seamlessly.

02

SAFETY FIRST

With a sealed cranking circuit and safe discharging, the PMP ESM sets a new safety benchmark.

03

LIGHTWEIGHT AND ENVIRONMENTALLY FRIENDLY

- Saves up to 200kg.
- The PMP ESM reduces CO₂ emissions and waste.

04

LOCAL SUPPORT AND TRAINING

From specification and installation to optimisation, PMP offers comprehensive local support and training.

05



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Design variations to suit all engine sizes



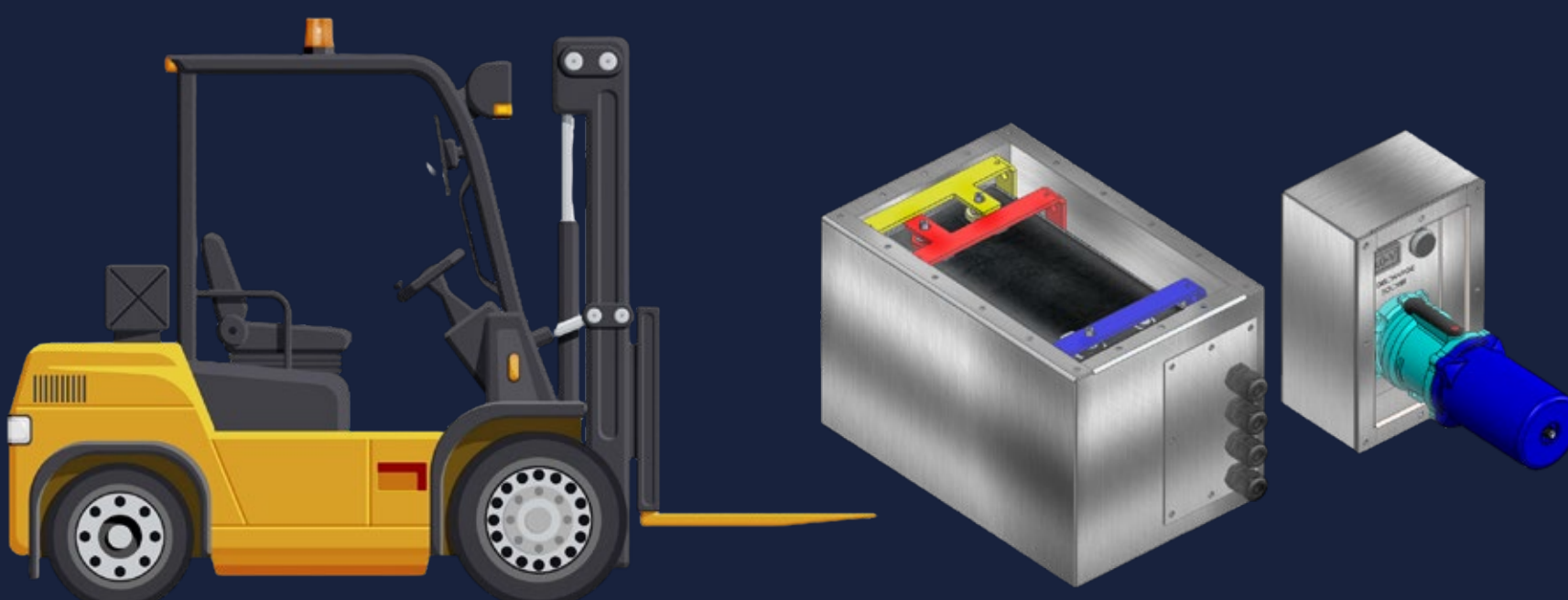
ESM - Quad

- Suitable for Heavy Mobile Equipment.
- Powered by 4 Skelstarts 24V.
- Integrated safety plug technology.



ESM - Dual

- Suitable for Medium Mobile Equipment.
- Powered by 2 Skelstarts 24V.
- Integrated safety plug technology.



ESM - Single

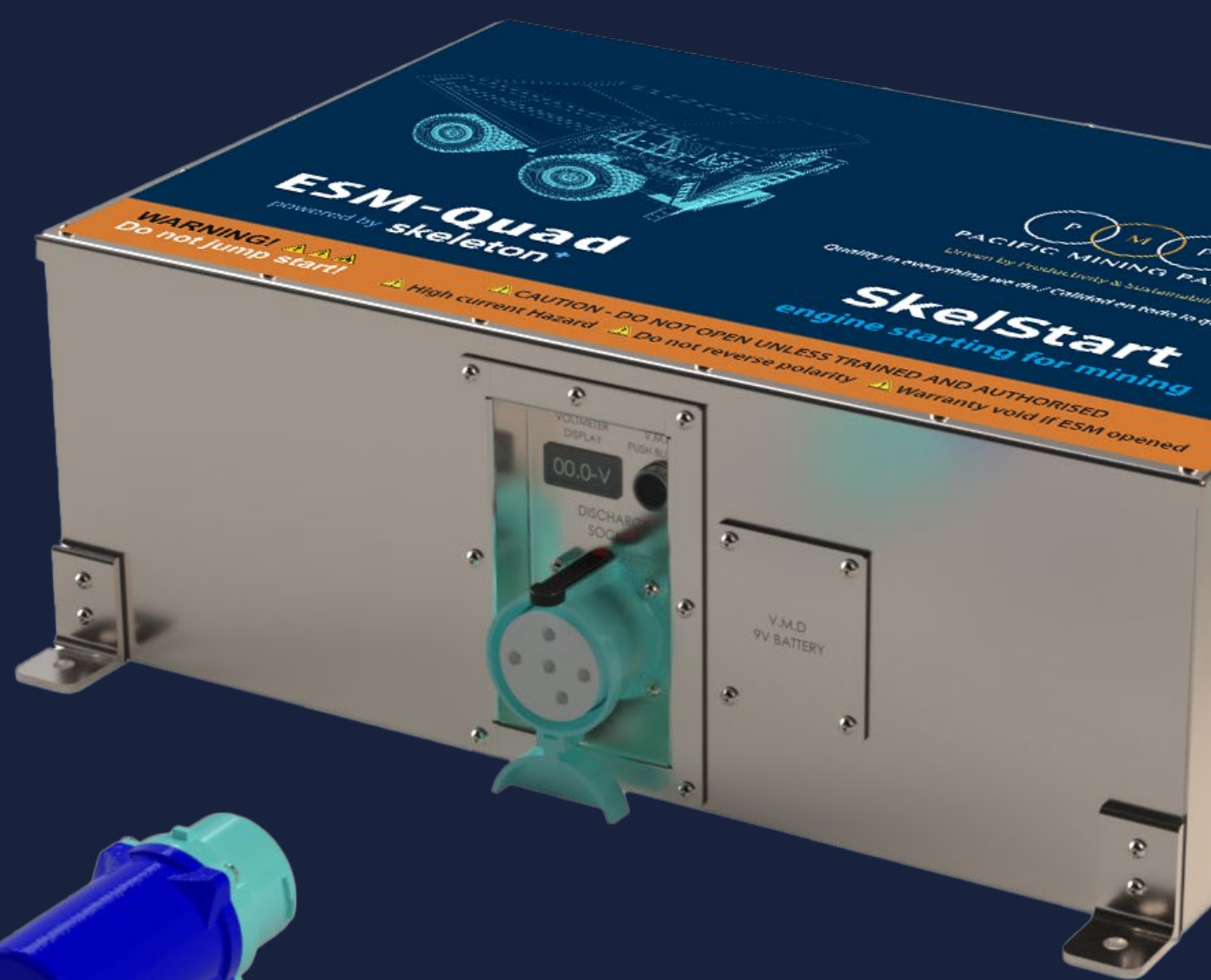
- Suitable for Light Mobile Equipment.
- Powered by a single Skelstart.
- Available in 12V or 24V.
- Dismountable safety plug technology (optional).



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Safety is built into the PMP ESM

Maintenance tasks
are **SAFER**, by
using the PMP
discharge module
Safety Plug, plus
the external
voltmeter.



Discharges the
ultracapacitors to
ZERO volts, creating
a safer environment
for maintenance work.



sales@pmpgroup.io
12 Channel Road, Mayfield West,
NSW 2304, Australia
www.pmpgroup.io

