**SkelStart**
ENGINE START MODULE
**12V & 24V**

# The most powerful module for starting large diesel engines

**Eliminate down time and forget about battery problems -**
The SkelStart Engine Start Module will crank your engine reliably even at -40 °C/F


skeleton+

## What is SkelStart?

The SkelStart Engine Start Module is a supercapacitor engine start module. It will start your engine anywhere, every time, and will crank any large diesel engine reliably, time after time.

Supercapacitors are an energy storage technology similar to batteries, but their strengths are very high power, 15+ year lifetime, and excellent reliability, even in extreme temperatures.


## Why SkelStart?

Your batteries have to power the lights, the A/C, the lift gate, and all electronics in your vehicle. All this on top of having to crank the engine, which requires high current and decreases the lifetime of your batteries. Supercapacitors are designed to provide high current and are ideal for cranking large diesel engines. You'll never need to worry about your engine not starting again.

**High power**
60X the power of batteries

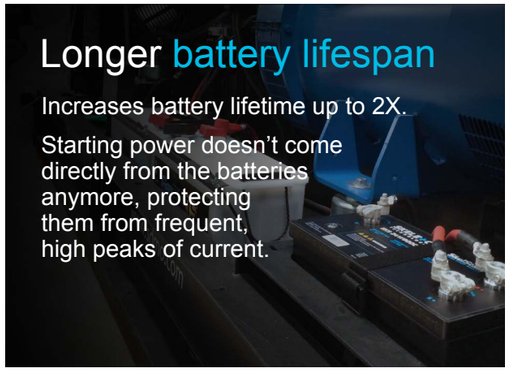
**No downtime**
reliable engine starting even with dead batteries

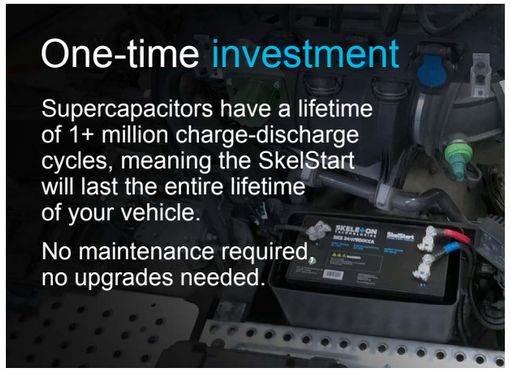
**Long lifetime**
1M+ lifecycles, no maintenance needed

**Works even at -40 °C/F**
with full efficiency


## Easy and safe installation

The SkelStart unit goes between your battery and starter, making it the sole starting power for your engine. The batteries will keep powering hotel loads (lights, A/C, and so on). Depending on your needs, the SkelStart can either replace one of your batteries, or be installed alongside your existing batteries.



## Real Life Use Cases

"Our truck is often on stand-by mode for a long time. Starting the engine has always been an issue. We liked the idea that the SkelStart holds full charge for 3 months and even if the Skelstart energy is used, it needs only 9V and couple of minutes to be fully charged from "dead" batteries. This allows us to start the engine regardless of the status of the batteries, to be more operational and to not worry about jump-start capability if we are on the road"

*- Janno Oras, Kalev AS*


"I used to idle my truck almost every day while I was cooking or watching TV - just to avoid surprises the next morning. Having SkelStart is like having an ace in my back pocket - whatever the weather, or the status of my batteries, I can still start the truck. I can also feel the engine cranking much faster now. I got SkelStart installed on a 2011 Scania R620 that I plan to replace in few years - thankfully SkelStart has a long lifetime, so I can just install it to my next truck."

*- Rainer, Lundens Frakt. Göteborg, Sweden*


| | SkelStart 12V | SkelStart 24V | Unit |
|---|---|---|---|
| Cold Cranking Amps (CCA)* | 2130 | 1230 | A |
| Maximum Peak Current (1 sec current)** | 3829 | 2547 | A |
| Peak Power* | 44.7 | 76.1 | kW |
| Charged full voltage*** | 13.5 | 27 | V |
| Energy | 37 | 37 | Wh |
| Rated Capacitance | 1360 | 340 | F |
| Individual Cell Capacitance | 3400 | 3400 | F |
| Charging current | 20 (max) | 20 (max) | A |
| Continuous input voltage range | 9-16 | 18-32 | V |
| Continuous input voltage range with specified charge time | 11.5-16 | 23-32 | V |
| Recharge time (from 0 V)*** | 20 | 10 | min |
| Operating temperature | -40 to +65<br>-40 to +149 | -40 to +65<br>-40 to +149 | Deg °C<br>Deg °F |
| Storage temperature | -40 to +50<br>-40 to +122 | -40 to +50<br>-40 to +122 | Deg °C<br>Deg °F |
| Standby current draw | <10 | <10 | mA |
| Dimensions | 328 L x 171 W x 241 H<br>12.91 x 6.73 W x 9.49 H | 328 L x 171 W x 241 H<br>12.91 x 6.73 W x 9.49 H | mm<br>Inch |
| Weight | 8.5<br>18.74 | 8.5<br>18.74 | kg<br>lbs |

* Based on 1s ESR ** The stated maximum peak current should not be exceeded during use. If the limit is to be exceeded by the customer, Skeleton must be consulted beforehand and give approval for the exceeded power load.
*** 90% State of Charge

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