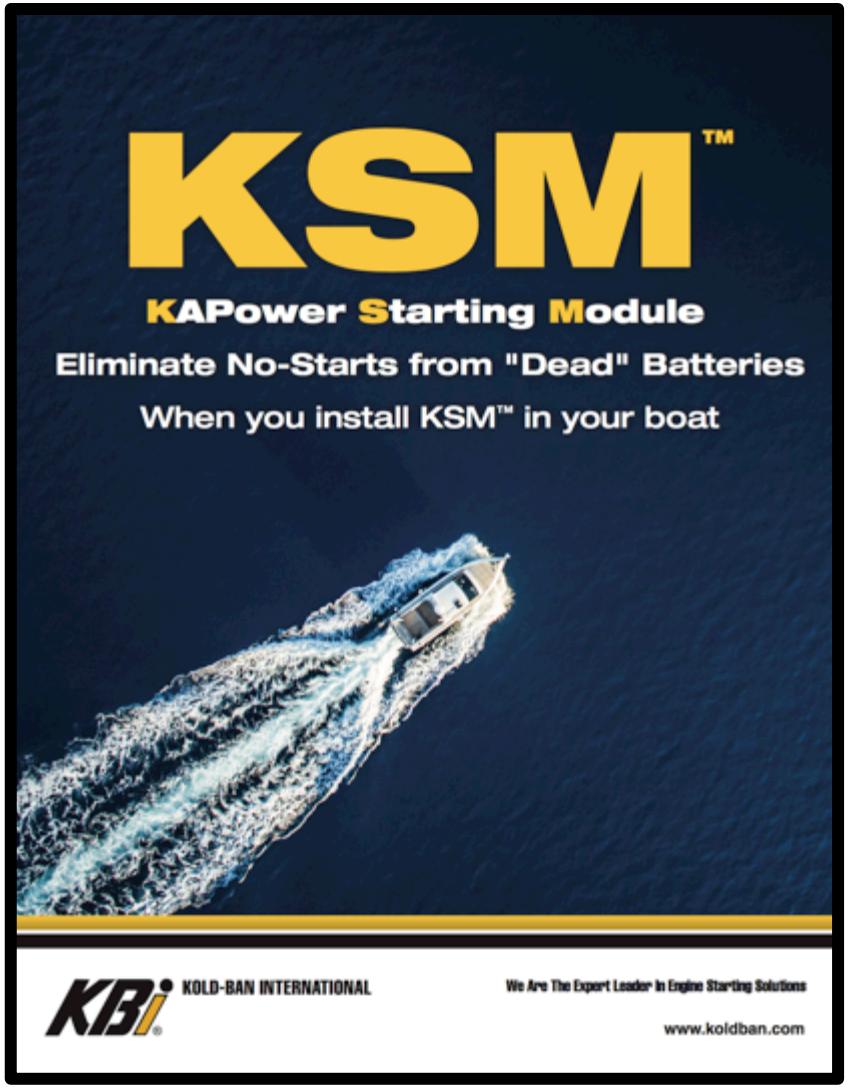
Don't rely on lead-acid batteries to start your engines.



October 2019
Rev C

Batteries will fail. Their end-of-life is inevitable .

KSM™

Avoid downtime from the failure of lead-acid batteries with the innovative KSM™ Starting Module. Engineered with a commercial grade supercapacitor, KSM™ gives your engine the power to start every time, regardless of the state of charge of your lead-acid batteries.

- **Quick recharge**—In 30 seconds, and the charge lasts for several months
- **Maintenance free**—Just install it, and it's ready to use again and again
- **Versatile**—Operates in temperatures from -40°F to 185°F
- **Long life**—Lasts over 1,000,000 cycles, up to 20 years
- **Easy to install**—Install in any orientation, vertically, or even upside down!
- **Made in the USA**

The KSM™ assures you will never experience a "no-start" from a dead battery again. It's a supercapacitor, and when it is installed in a boat, downtime from a dead battery is completely eliminated.

The device is initially energized from the boat's electrical system and stores the energy until needed. Even with a rundown battery, the KSM™ provides an engine the power it needs to start. It is virtually unaffected by temperatures and is completely maintenance free.

KSM™ has a long service life, with upwards of one million cycles without the loss of cranking power, compared to an average battery's life of 300 – 500 cycles. It often outlasts the equipment it is installed in. Thousands of units are in service and have been operating effectively for many years.

KSM™ is 100% maintenance free, so you don't have to access it until you move it to your next boat.

Dead batteries are a simple fact of life when it comes to boat operation and ownership. Long periods of disuse, temperature extremes, corrosion, shock and vibration all take their toll on your engine's cranking battery. Unlike a car, jump starting a boat isn't easy, it usually requires especially long and heavy jumper cables, finding and hooking up a battery charger or removing the battery and taking it someplace where it can be charged and the danger of jump starting batteries, with the potential for an explosion, is well documented.

KAPower is not a battery. KAPower is a Electrochemical Double Layer Capacitor.

KSM™ Advantages

Lightweight
Substantial weight savings over a lead-acid battery

"DEAD" Battery Starts
KSM™ is the ONLY supercapacitor (ultracapacitor) design that allows an engine to crank regardless of the state of charge of the batteries.

Full Recharge in 30 Seconds
KSM™ recharges to 100% capacity in as little as 15 – 30 seconds.

Virtually Unaffected by Temperatures
KSM™ is used for engine starting applications in temperatures that range from -40°F to 185°F.

Long Storage Life
KSM™ is a supercapacitor (ultracapacitor) design that will hold its energy for extended periods of time without needing a charge or degrading performance.

Simple Design
Just plug and play, the KSM™ requires no sophisticated electronic controls. The PLC (Programmable Logic Controller) provides years of trouble free operation.

Long Life
The KSM™ maintains cranking performance for upwards of 1,000,000 cycles and has a 15 – 20 year life.

Easy to Install
KSM™ has several PATENTED methods for installation, depending on what power needs are trying to be achieved.

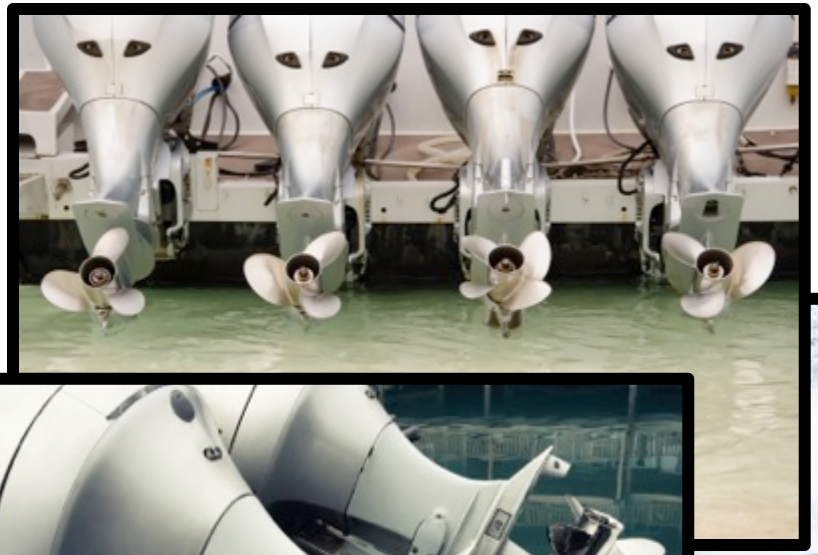
With KBI's range of specialized engine starting products, however, that equation has changed forever. Unlike lead acid batteries, KBI products rely on supercapacitors, also known as ultracapacitors. Using either the permanently installed KAPower Starting Module (KSM), or the portable KrankingKART Mini HD, it is now possible to have onboard, reliable, back-up starting power, in reserve, that's always there when needed.

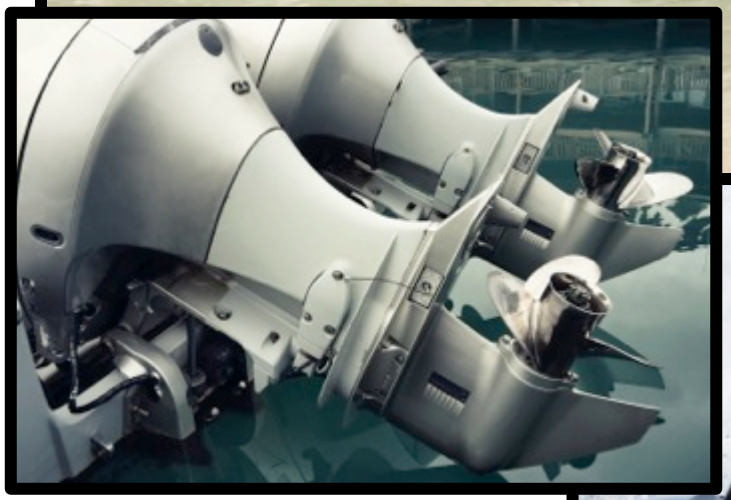
The KSM provides the engine starting power ***every time*** the engine is started, sparing the vessel's battery.

So what does this mean to the boat or the boat builder?

- The KSM Supercapacitor module is powerful enough to supply cranking power without the use of lead-acid batteries.
- Available as a 12 or 24-volt module, one module can provide 24 volts - no need to series modules (batteries).
- One module is all that's need to start several engines - eliminate multiple battery banks.
- The KSM can be left "on-line" while the vessel is in operation, buffering electrical brownouts.
- It is truly maintenance free and will last the life of the vessel.
- No gassing, no ventilation required. Can be installed in virtually any orientation.
- It can be installed in remote locations, not needing access for change-out like the batteries do.
- It will provide weight savings and space savings.
- When isolated it will retain sufficient charge for engine cranking for extended periods of time.
- It can be recharged almost instantaneously (within seconds) if need be off the house batteries or any other DC power source.

Inboard or outboard applications, not every engine would require its own set of batteries for engine starting events.





One KSM could provide starting assistance to several engines.

"Once installed it's like having an emergency battery permanently on standby without any of the maintenance an actual battery requires."

KBi

KAPower Starting Module (KSM)

INSTALLATION – OPERATION MANUAL
Gen 3. Rev E

Gen 3
12 & 24 Volt

KBI/Kold-Ban International, Ltd.
8390 Pingree Road, Lake In The Hills, Illinois 60156-9637 U.S.A.
(800) 527-8278, (847) 658-8561, Fax (847) 658-9280, www.koldban.com
ATA VMRS - T44 KLDBN

KBI® KAPower® © 2018 KBI Form #131400 Rev. E

Installation for the KSM is straightforward, its stainless steel enclosure is lightweight, the heaviest model, which supplies 112 kW, weighs only 32.5 pounds (14.7 kg); it can be mounted in any orientation, even upside down.

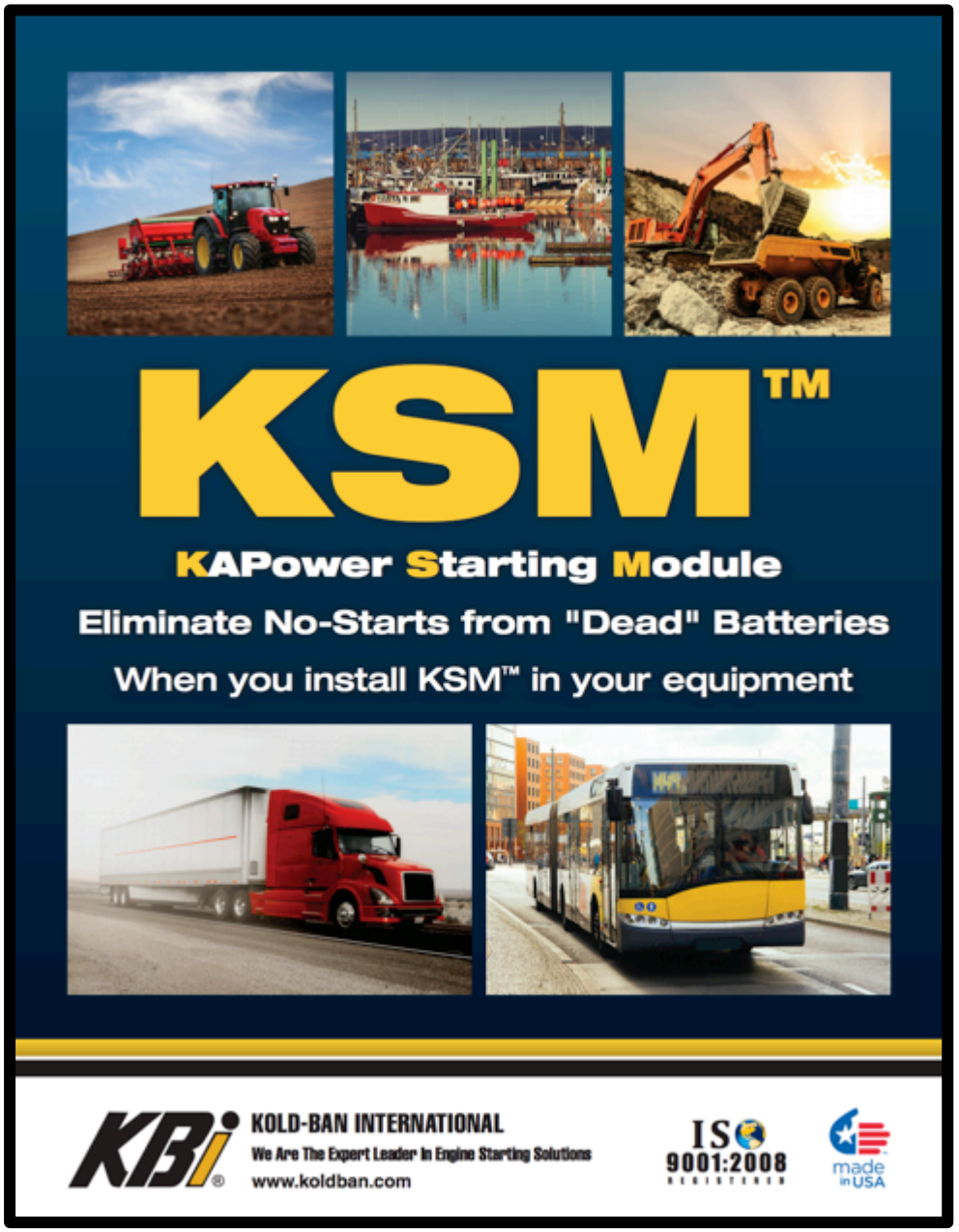
KSM specifications for every application.

Specifications

	12 V 6 Cell Unit	12 V 10 Cell Unit	24 V 10 Cell Unit	24 V 12 Cell Unit
Electrical Characteristics				
Operating Voltage Window	7 – 14.5 V	7 – 14.5 V	8 – 29 V	8 – 29 V
Maximum Voltage	18 V	18 V	30 V	33 V
Minimum Voltage	0 V	0 V	0 V	0 V
Internal Resistance	0.0011 ohms	0.0008 ohms	0.0019 ohms	0.0022 ohms
Capacitance	525 F	1260 F	315 F	263 F
Energy Stored within Operating Voltage Window	42.3 kJ	101.6 kJ	122.4 kJ	102 kJ
Energy Stored at Max Voltage	85.1 kJ	141.8 kJ	141.8 kJ	142.9 kJ
Maximum Power	47 kW	112 kW	112 kW	94 kW
Leakage Current at Max Voltage	4.5 mA	4.5 mA	4.5 mA	4.5 mA
Operating Conditions				
Operating Temperature Range	-40° – 185°F (-40° – 85°C)	-40° – 185°F (-40° – 85°C)	-40° – 185°F (-40° – 85°C)	-40° – 185°F (-40° – 85°C)
Cycle Life	>1,000,000	>1,000,000	>1,000,000	>1,000,000
Dimensions and Weight				
Length x Width x Height	14.79" x 7.75" x 8"	19.44" x 7.75" x 8"	19.44" x 7.75" x 8"	19.44" x 7.75" x 8"
Weight	22 lb	32.5 lb	32.5 lb	34.5 lb

The KSM is available in 12 and 24 volts, and several capacity ranges. All units recharge after use in a scant 30 seconds.

Some background on KBI:

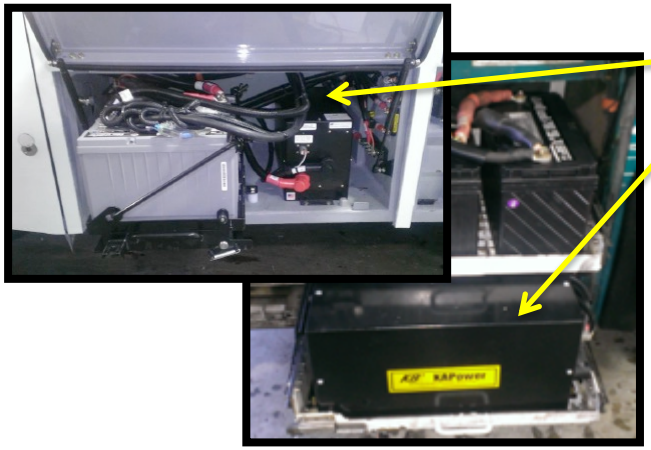


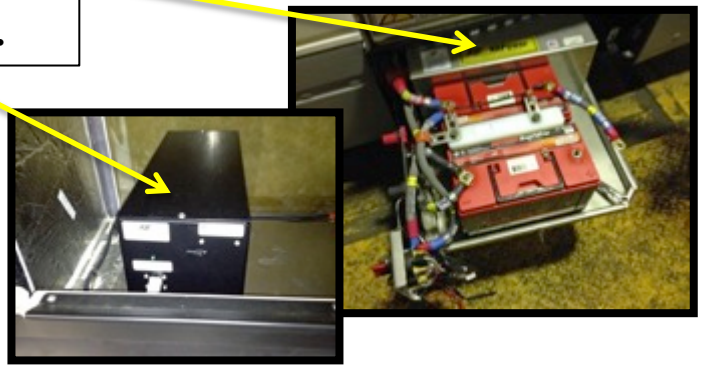
While KSM is a relative newcomer to the marine market, we've been in the engine starting business for over half a century, selling primarily to some of the harshest applications in the world, including commercial, military and over the road transport vehicles.

KBI has thousands of systems installed on US City Transit Buses.

Virtually every North American bus builder offers it's customers the KBI KSM system as factory installed.

The KBI KSM factory installed.






KBI
Virtually all major US Cities have KBI system on their buses.
SWIFT
BROWARD COUNTY Transit
miWAY
the
OmniTrans
Cherriots
LYNX
Metro
MTA
WTA
THE rapid
Spokane Transit
Kitsap Transit
Milwaukee County Transit System
pace
METRO
OCTA
Culver CITYBUS
TRIMET
THE NEW VIA
cta
MTS
UTA
DTA
SANTA CRUZ METRO
WAIKIKI BEACH
TheBus

Over twenty years experience with supercapacitors for starting engines.

Where to Use KSM™

To eliminate engine no-starts due to battery failure

www.koldban.com

Farm equipment | Construction equipment | Boats | Buses | Trucks

KSM™ often outlives the equipment!

What Customers Are Saying about the KSM™

www.koldban.com

"Normally, you'll get around 300 cycles out of a well-maintained battery, but the KSM™ is designed to run 1,000,000 cycles. It will outlive the boat, the motor—even the owner. It's like having an emergency battery permanently on standby without any of the maintenance an actual battery requires.

"The KSM™ is simple to install, and it's designed to last forever. As simple as its purpose may be, the KSM™ is truly amazing. I'm shocked nobody came up with this sooner, as it's only a matter of time before every boat has one."

—**Christopher Labozza**, Executive Vice President
Precision Marine Center

"I think the KSM™ could give builders of ultra high performance sport fishing boats a competitive advantage. The supercapacitors replace a large starting battery bank, reducing weight and footprint in the engine room installation. Our technicians like it, because it means no more hauling 8D batteries out of the engine room, and it extends the life of the starter."

—**Sean Prendergast**, Training Manager
Gregory Poole CAT

We are working with marine OEMs, Mercury Marine in particular on a "standard" for boat builders. Many are interested. Again we're new to the industry but the KSM and our experience is not new. We have been applying supercapacitor engine starting technology for over twenty years. We are American Boat and Yacht Council members and KBI has an ABYC Certified Technician on staff.

The portable KrankingKART Mini HD, also uses supercapacitor technology.

The first and only jump-start pack made specifically for the Marine Market, the Mini HD is a portable start pack that is housed in a rugged ABS plastic case, which is waterproof to IP 67 standards, it even floats.

With its digital volt meter, 1,500 amp output, built in reverse polarity protection, 6 foot long cables and heavy duty copper clamps, it's designed for operation in the toughest jump starting environments.

More customer testimonials.

Where to Use the KrankingKART® Mini HD

www.koldban.com

Farm Equipment | Paratransit Vehicles | Boats | Buses | Trucks

What Our Customers Say about the Mini HD

"We've relied on the Mini HD for 2 years, and I just recently ordered 3 more units for our new boats. I also keep one in my truck to respond to customers who dock at a local restaurant and need a quick start. With the Mini HD, I'm always ready to go."

– **Captain Kerry Kline**
Sea Tow, Fort Loudon

"We bought the KBI Mini HD for its state-of-the-art technology. We jump start a lot of boats, and the ability to recharge the device in 30 seconds was a huge selling point for us. The Mini HD definitely saves me time, and I would recommend it to others in the industry."

– **Rob Butler**
TowBoatUS San Diego

The Mini HD will outlast conventional jump-start devices several times over.

Visit http://www.koldban.com/
For copies of all literature and details.

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Lake In The Hills, IL 60156 USA
PH: (847) 658-8561 Ext. 1004
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KBI is proud to be a part of the Marine Industry. KBI will continue to develop and supply superior products which will enhance our customers' product performance and reliability.

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