

Living on the road

For heavy-duty applications such as utility trucks, ZeroRPM's solutions can provide power to onboard equipment without idling the engine. In this photo, a utility crew fixes damage following a summer storm in Yonkers, N.Y.

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XANTREX, ZERORPM SYSTEMS ENSURE TRUCK DRIVERS AREN'T MISERABLE IN QUIET DESERTS, COLD CITIES. BY **CHAD ELMORE**

Mission Critical Electronics (MCE) has acquired ZeroRPM, a supplier of anti-idling technology, in a move that followed a technical and distribution partnership announced earlier this year by both companies. ZeroRPM's technology converts conventional commercial vehicles into hybrid units to run dash-based systems. It also compliments the Freedom eGen auxiliary power system sold by MCE subsidiary Xantrex.

"ZeroRPM's patented solutions provide continuing power to onboard equipment, and heating and air-conditioning to the passenger compartment, without idling the engine," said Kevin Moschetti, CEO, MCE, Huntington Beach, Calif. "It creates a hybrid vehicle with lithium-ion battery technology that integrates seamlessly with a vehicle's engine and existing electrical system, and automatically restarts the engine to recharge the batteries, when necessary."

With the acquisition, Moschetti said MCE will "expand on ZeroRPM's existing strength in the work truck, government and emergency vehicle markets by bringing their solutions into other specialty vehicle and marine applications. "Some of the most exciting applications we are working on are in the recreational vehicle and heavy-duty truck markets where ZeroRPM's products provide enhanced comfort for users," he said.

For MCE's part, the acquisition is expected to strengthen its presence in the vehicle electrification space and underscores its "commitment to being a leader in providing clean energy solutions."

MCE already offers electrical power solutions through brands and subsidiaries such as Purkeys, Kusssmaul Electronics, Newmar Power and Xantrex.

HYBRID POWER SOURCE

When a vehicle is placed in park, the ZeroRPM system automatically shuts down the engine and provides the required power for air conditioning and heating as well as onboard electronics, including lights, radio, computers and truck body components such as liftgates. During extended times of stationary use, the system manages the engine start/stop to recharge the batteries as needed. It captures all the data associated with the engine off-technology – utilizing ZeroRPM's own Intellimetrics software to give users insight into how the system performs.

Benefits of using the system include reduced emissions, lower fuel consumption, reduced operating costs, extended OEM warranty periods (based on fewer engine hours) and improved operator safety and

comfort, said MCE. It can also eliminate engine noise due to idling and can extend work time in idle-restrictive zones.

"Xantrex and ZeroRPM have been going down similar paths for quite a few years," said Don Wilson, application engineer, Xantrex, Burnaby, B.C., Canada. "Once we got together and had some discussions, it wasn't that big of a stretch to merge what we're doing and create a package that works for a wide range of applications."

The best way to think of the Freedom eGen and ZeroRPM product catalog, according to Wilson, is that the former replaces a generator or auxiliary power unit (APU) on a vehicle, while the latter features dash integration. In both systems, a conventional lead-acid battery stays on the job to start the vehicle's engine.

"If you want to climate control the cab, ZeroRPM is your tool," said Wilson. "If you want to climate-control the box behind the cab, Freedom eGen is your tool. When we merge the two, through our eGen Max line,

both tie into one bank of lithium batteries. The inverter on the eGen system will take care of the hotel loads while ZeroRPM's tools integrate into the vehicle's engine and electrical system to take care of the dash components."

Founded in 2012 through a business incubator program at Alabama's Wallace State Community College, ZeroRPM has targeted its Idle Mitigation (IMS) products at the work truck market from the beginning to help end-users take control of fuel usage and maintenance costs.

"Boom trucks, for example, typically go out to a jobsite where they're going to sit and wait," said Wilson. "If there's a guy sitting in the cab, he's not going to shut his engine off because he wants that air conditioner to keep running, listen to the radio or whatever. With ZeroRPM, the operator can have those creature comforts. You can give them the dashboard air conditioning without running the engine. When the batteries get depleted, the engine will start up automatically."

BATTERIES FOR HOTEL LOADS

Freedom eGen is an integrated system powered by a lithium-ion battery. It works like an engine-based APU but has a dedicated battery bank that provides power to run hotel loads such as televisions, microwaves, coffee makers and auxiliary HVAC units. It can be ordered as an OEM install with many truck brands or as an aftermarket solution through Xantrex dealers.

Batteries of the lithium iron phosphate variety are available from 125 Ahr to 1260 Ahr through a fully customizable power generation system. The integrated Freedom XC inverter/charger converts dc electricity from the battery bank into ac power. Available in various power levels – with ratings of 1000 to 3000 watts, the models have high surge capability and sine wave output to protect sensitive electronics such as computers. The Xantrex lithium iron phosphate batteries feature integrated Intelligent Battery Management System (BMS) and voltage regulator and can be

charged from a second alternator, shore power or solar.

The Freedom eGen product was born to the Class B van market – such as the Ford Transit and Mercedes-Benz Sprinter – that are popular as motorhomes and work vehicles.

Consumer and fleet tire repair franchise Tread Connection installed Freedom eGen in its van-based mobile workstations. It is used to power tools such as tire mounting and balancing machines and air compressors at a car or truck owner's location with the van's engine off. Freedom eGen is also part of Winnebago's Sprinter-based Revel, a four-wheel-drive camper designed for excursions miles away from the pavement.

The dimensions of the standard Class B van chassis limited the size of generator that could be used in that application, and since you "can't oversize the generator in a van, you get situations such as when an air conditioner turns on and creates a heavy load, the generator struggles and the result is brown outs or appliances that don't work."

A COMFORTABLE DISCOVERY

The company's engineers found that lithium-ion batteries, working through an inverter, would keep the living area in an RV cool while camping in the desert as well as the cab of Class 8 truck, parked on the tarmac waiting its turn at loading dock.

"In the over-the-road truck market, Freedom eGen is a no-brainer for operators who want to stop for the night and be able to run the HVAC all night," said Wilson. "It functions the same way as a diesel APU, except at the end of the night, we're filling up our 'tank' when the engine is running rather than a fuel station stop."

While marketing photos for off-road capable Class B campers such as the Revel generally show the vehicle traversing hot desert terrain, Wilson said Xantrex engineers "found the most challenging application to support wasn't the guy going to Death Valley in July, it was people going to Vail in February. They're driving their four-wheel-drive vans up the mountain to go skiing all

The components of the Freedom eGen, a fully integrated system designed to power accessories without burning fuel.

day. When they return to a van that's been sitting in sub-zero temperatures they've got batteries that don't want to function.

"One of weaknesses of lithium batteries is that they can't discharge or charge if they're below a certain temperature – or even above a certain temperature, but that's very hot," said Wilson. "We really worry about freezing temperatures. The lowest charge temperature is usually around 32° F and it can be discharged down to -3° F."

To counteract that reality, Xantrex added a heating pad to each battery pack so that when the ambient temperature drops below freezing, it can use its own battery power to stay above freezing. When the skier – or truck operator – returns and starts the engine the battery will charge quickly. All of that happens automatically.

The Freedom eGen lithium-ion battery is also equipped with a circuit that controls the charging rates based on what the battery needs.

The batteries are stackable, as well, with flanges so they can be electrically as well as physically attached. "If you need to add another battery bank, you don't have to

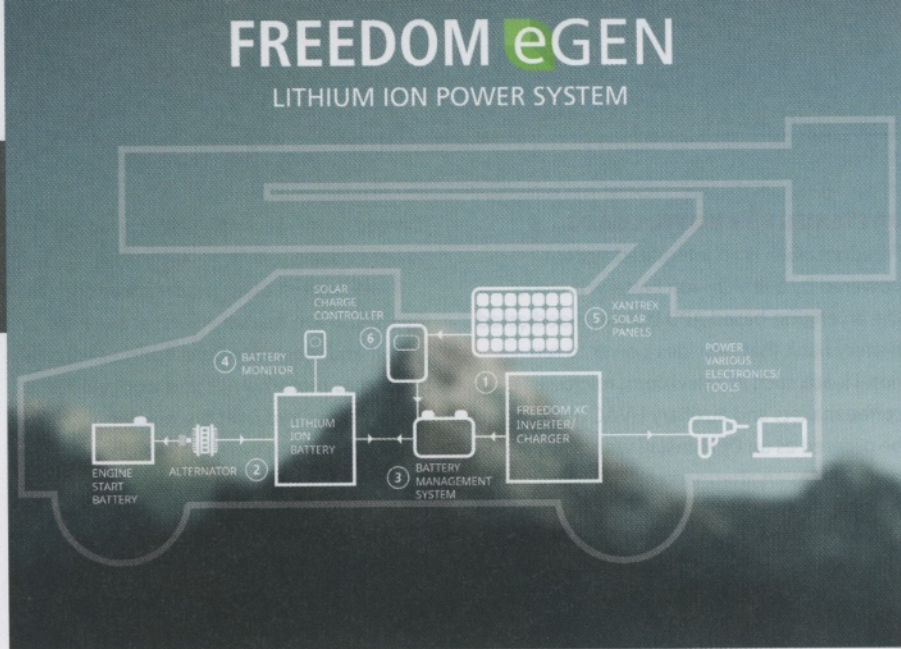


figure out where to mount it," said Wilson. "You can drop it in and bolt to the battery that sits next to it so it becomes one physical piece."

SOLAR POWER, TOO

The system can also be ordered with a solar kit. In an RV application, solar panels add an off-grid source of power to ensure any vehicle parked for prolonged periods will have fully charged batteries.

"On a few of our heavy-duty applications, instead of adding a secondary alternator, we have added flexible solar panels that are essentially peel and stick," said Wilson. "On a truck, we stick the solar panels onto the fairing so they can grab solar power while

moving down the road. That will help charge the batteries and pull a little less off the engine – any amps generated by the engine is going to use some fuel, and if you're driving during the day the truck is out there in the sun anyway.

"A lot of people try to think about solar to sustain the entire system. But really, when you're talking about a vehicle, you just don't have the real estate to sustain it. We believe it is really more about helping charge the batteries or slowing their discharge."

 www.xantrex.com

 www.zerorpm.com

 www.mission-critical-electronics.com