An Electrifying Experience
HydraForce ECU Controls Battery Powered Tundra Buggy for Polar Bear Viewing on the Arctic Tundra

CHALLENGE
Adventure tourism appeals to thrill-seekers looking for that edgy experience – kayaking with beluga whales, roaming the plain with bison or travelling the tundra with wild polar bears. Frontiers North Adventures in Churchill, Manitoba, Canada has been offering experiences like these since the 1970s and is always looking for ways to enhance the element of adventure. Since the tundra is a fragile ecosystem, protecting this environment from sound and diesel fuel emissions is also a concern.

STRATEGY
As their clientele shifted from "wild eccentrics" to more "leisure-oriented" tourists, Frontiers North Adventures developed a diesel-powered tour bus called the "Tundra Buggy" to take up to 40 adventurers into the tundra in heated comfort. The 13-foot, 10-inch tall, 4-wheel drive vehicle has viewing windows at just the right height to safely observe 8-foot tall polar bears in the wild. Powered by a 7.6 L Navistar DT466 diesel engine rated at 235 horsepower, the Tundra Buggy has an Allison transmission and various differentials and planetaries on the wheel hubs. Frontier operates a fleet of 12 Tundra Buggies that travel a set of established trails created in the miliary in the 1950s, to prevent further damage to the tundra ecosystem.

The Tundra Buggies operate for about 8-10 hours per day, don't go very far, and aren't driven very hard. John Gunter, President and CEO of Frontier North Adventures decided to explore the possibility of converting them from diesel to battery power, to help reduce emissions and noise. With help from Red River College Polytechnic (RRCP) and the Manitoba's Conservation and Climate Fund, Frontier was able to "electrify" the Tundra Buggy and convert it from a diesel-powered to a battery-powered electric vehicle (EV). Working with JEM Technical, a HydraForce distributor located in Minnesota, Frontier North Adventures added custom display and controller software that integrated the ground drive propulsion and hydraulic steering systems with the vehicle's battery management system. JEM specified a HydraForce ECU-2415A electronic controller for the system, and used HF Impulse software to configure its I/O (inputs/outputs) and CAN communication parameters.

"The HydraForce ECU-2415 was selected for this application because it had the right I/O capabilities, CAN bus interface and processing power to integrate the vehicle's user interface, steering and electric propulsion with the battery management system," explained Andrew DeRung, Director of Sales and Marketing for JEM Technical. "The integration of these

components is just an extension of the work JEM is doing today to connect the subsystems of traditional diesel-powered machines."

RESULT

"We're now able to give our guests a silent tour experience," said Gunter. "We can be less of a disturbance for wildlife and the big machine can be less of a distraction out on the tundra. For us, the whole point of the EV Tundra Buggy is to help these big machines in Churchill fade into the background and be less of a distraction for everybody's wildlife viewing experience. And that's not just for our guests, but anybody who is out there," he added.