ByWire XGV™
Hybrid Escape Drive-By-Wire Platform

Drive-By-Wire Platform > Safety Systems > Power Distribution > Navigation & Autonomy > Operator Control

Integration-Ready Ground Vehicle System

For unmanned systems researchers, developers and integrators, the ByWire XGV provides an integration-ready drive-by-wire controlled ground vehicle. This platform contains tightly integrated safety components and an onboard power management system, allowing you to stay focused on developing advanced unmanned vehicle technology.

The ByWire XGV utilizes the Hybrid Escape's proven vehicle technologies, tapping into electronic controls, available battery power, and on-road / off-road ruggedness for flexibility of application. Controlled through a unified Ethernet interface, the drive-by-wire conversion is seamlessly integrated with the Hybrid Escape factory electronics. The ByWire XGV provides electronic control of the steering, throttle, shifter, braking, and signals. In addition, information such as vehicle speed, warnings, and errors can be monitored.

The need to interface easily with your third party technology is central to the design. This is why the clean vehicle conversion leaves the trunk, as well as the front and rear seats unaltered, leaving plenty of real-estate for installing hardware in factory installed racks or using your own mounting solution.

The integrated SafeStop™, a wireless emergency stop system with a 6 mile line-of-sight range, provides emergency stop functionality. Manual stop buttons are mounted inside and outside of the vehicle for additional safety.

A key benefit of the XGV is the availability of onboard electric power, which prevents the need for adding additional sources of power to the system. The optional PowerHub™ power conditioning and distribution modules allow for use of up to 6 kW of managed power, which is configurable over Ethernet through a web browser.

Key Features & Benefits of the ByWire XGV Platform

- Cost Effective Platform
- Ethernet DBW Interface
- Easy System Integration
- Built-In Safety Features
- 6 kW Power Supply
- Versatility of Application

System Integration Diagram

The ByWire XGV base package consists of the drive-by-wire converted Hybrid Escape and integrated SafeStop safety systems. A demo OCU is provided that allows for control, testing, and calibration, and a web-based configuration utility can be used to control and configure various system parameters.
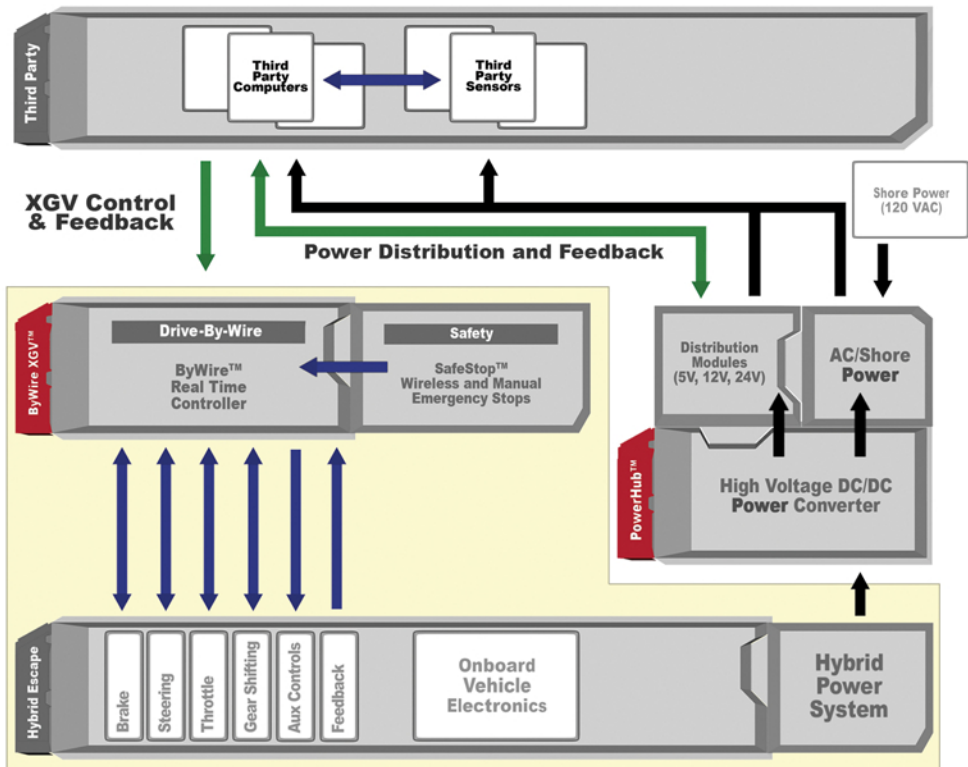
The optional PowerHub™ modules convert, manage, and distribute the onboard electric power supply to provide a comprehensive, integrated managed power solution.

With drive-by-wire, safety, and power provided for in the ByWire XGV, you can stay focused on developing and integrating more advanced unmanned technologies.

— Ethernet
— Proprietary
— Power

TORC Products

Included in Base XGV Package

XGV Control & Feedback

Power Distribution and Feedback

Third Party Computers — Third Party Sensors

Shore Power (120 VAC)

Drive-By-Wire — ByWire™ Real Time Controller

Safety — SafeStop™ Wireless and Manual Emergency Stops

Distribution Modules (5V, 12V, 24V)

AC/Shore Power

High Voltage DC/DC Power Converter

ByWire XGV — PowerHub™

Hybrid Escape: Brake, Steering, Throttle, Gear Shifting, Aux Controls, Feedback

Onboard Vehicle Electronics

Hybrid Power System

Control Inputs

Open Loop
- Throttle
- Steering
- Brake
- Shifter

Closed Loop
- Desired Speed
- Desired Acceleration
- Curvature
- Rate of Curvature Change

Devices
- Vehicle Start / Disable
- Left / Right Turn Signals
- Hazards
- Horn
- Low Beam Headlights
- High Beam Headlights
- Fog Lights
- Parking Lights

Feedback

- Vehicle Speed
- Individual Wheel Speeds
- Steering Angle
- Throttle Percentage
- Brake Percentage
- Shifter Position
- "Ready-to-Drive"

- Left / Right Turn Signals
- Low Beam Headlights
- High Beam Headlights
- Fog Lights
- Parking Lights
- Door Status
- Errors

Factory Installed Options

- PowerHub™ High Voltage DC-DC
- PowerHub™ AC / Shore Power
- PowerHub™ Distribution Modules (5V, 12V, and 24V)
- External Emergency Stop Buttons
- Emergency Manual Override Buttons
- Warning Light
- Warning Horn

"We could have spent the time to make our own system, but with our goal being research into autonomous vehicles, buying this system was one less thing we are going to need to troubleshoot if something doesn't work how it should. It's a clean installation, you really don't see much different than you would see off the factory floor." - Jonathan Sprinkle, Assistant Professor in University of Arizona's Electrical & Computer Engineering Dept.

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