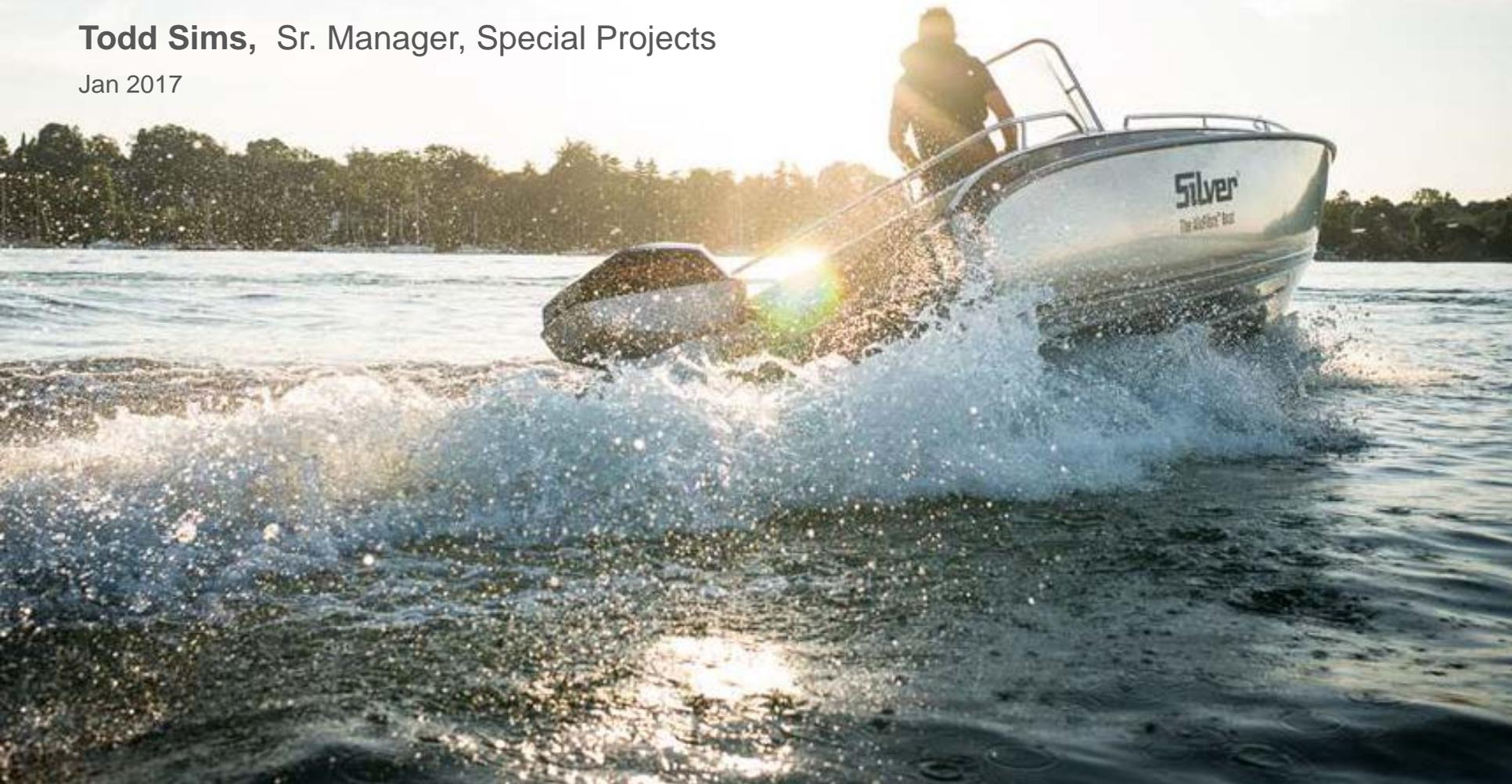


TORQUEEDO
STARNBERG.GERMANY

Torqueedo Electric Propulsion for San Antonio River Barges

Todd Sims, Sr. Manager, Special Projects

Jan 2017



Introducing Torqeedo

TORQUEEDO
STARNBERG.GERMANY

Global #1 in marine electric mobility

- Sales and Service in 45+ countries
- Over 60,000+ electric propulsion systems in the field

Power classes equivalents from 1 to 80 HP

- Best performance in our targeted segments
- Latest technologies

Founded February 2005

HQ near Munich, Germany

- Engineering, Manufacturing, Admin, Sales and Service

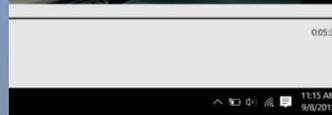
North American office in Crystal Lake, IL

- Sales and Service



Portfolio of Customers: Large Craft

Electric propulsion in the
40-160hp power class



Portfolio of Customers: Fast Boats

TORQUEEDO
STARNBERG.GERMANY



Electric propulsion in the
40-160hp power class

Portfolio of Customers: Small Craft

Electric propulsion in the
1-4 hp power class



Portfolio of Customers: Medium Craft



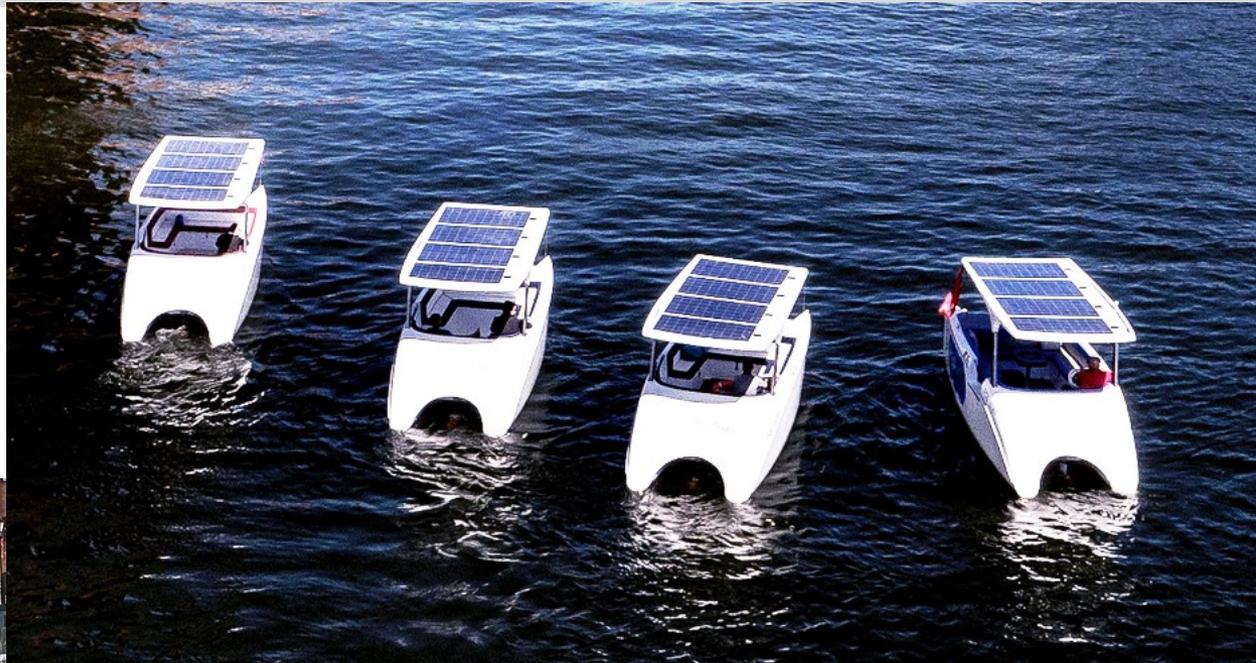
Our successful **Cruise Model Line**



Electric propulsion in the
5-20 hp power class



Green Dream Boats in Poland



- 40 boats delivered into rental operations worldwide
- orders for 40 more

Portfolio of Commercial Customers

City of Brisbane Queensland, Australia



- 2 Water Taxis
- (more in development)
- 15 passenger
- Twin Cruise 4.0, 8 POWER Batts
- 10hrs@ 5knots
- since early 2015

Ecobalsas - Brazil

- 10 tourist ferries
- 40+ passengers
- Cruise powered



8 | O GLOBO | BARRA
Domingo 22.12.2013

Passeio boladão

Barco em formato diferente, que já foi táxi, está em teste para transportar turistas

ROBERTA CALABRE
roberta.calabre@oglobo.com.br

Nas últimas semanas, quem passa pela Lagoa da Tijuca deve estar curioso para saber o que uma enorme bola de futebol flutuante faz dentro d'água. Na verdade, a cápsula é uma Float Ball, barco com motor elétrico destinado a passeios turísticos.

Comandado por marinheiros formados pelo Instituto Graef e com capacidade para

dez pessoas, o barco é uma reprodução de um projeto feito para a Copa de 2010, na África do Sul. Lá, a cápsula foi concebida para ser uma bola-táxi, transportando passageiros por rios e lagos. No Brasil, a bola, que está em fase de testes nas águas da Barra, entrará em operação no ano que vem, para passeios turísticos e culturais nas principais capitais brasileiras. Serão várias unidades, todas equipadas com TVs de LED, internet gratuita



4G, som ambiente e iluminação noturna, já que haverá tours de dia e à noite. — O projeto das Float Balls contempla diversas atividades: passeios turísticos de 15 a 20 minutos, projetos sociais

com aulas a bordo sobre educação ambiental, informações sobre a Copa no Brasil e informações turísticas e culturais sobre cada cidade — explica Giovanni Luigi, presidente da Float Ball no Brasil. ●

Para a Copa. Giovanni Luigi e a Float Ball: barcos como este farão passeios turísticos em várias cidades em 2014

FloatBall

- 30 units sold as rentals
- Dozens of units used during 2016 Olympics

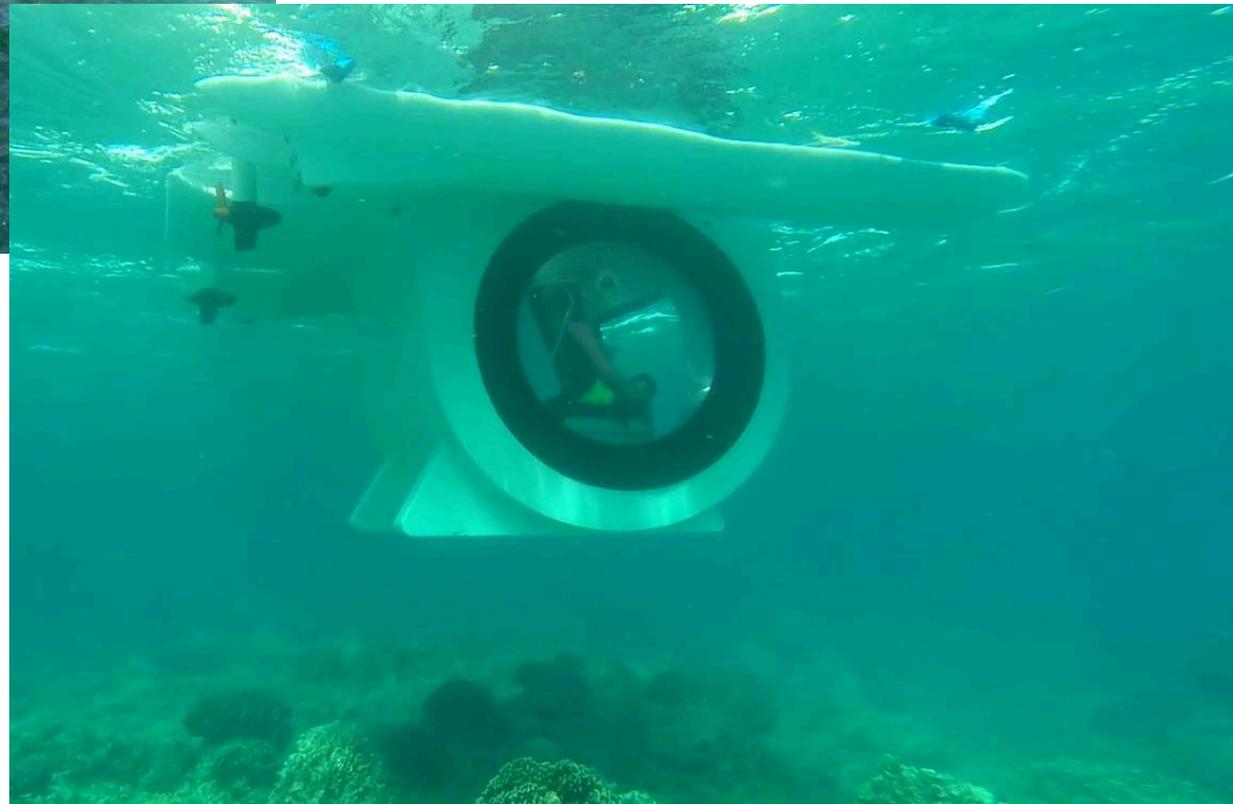
Portfolio of Commercial Customers



Ego Inc.

Semi Submersible in Korea

- 30 units for rental with guide
- Twin Travel motors



Portfolio of Commercial Customers

City of Rotterdam, NL

- on-call water taxi
- 1 unit so far, 12 more in fleet
- new build hull design to maximize performance



Portfolio of Commercial Customers



Volkswagen plant in Wolfsburg

- Approx. 20 boats for the employees to use during break periods

Portfolio of Commercial Customers



GoBoat in Copenhagen, Denmark

- 60 rental boats in operation
- PO's for 200 more this year



Portfolio of Commercial Customers



Au Feel De L'eau'
in Ottawa City, Canada

- 12 passenger Water Taxi
- Twin Cruise w/8 POWER Batteries
- Speeds from 6-12knots
- 2 Taxis, since early 2012





Hapag-Lloyd Cruise Lines, DE

- Boutique ships go to Antarctica and Galapagos
- 6 Zodiacs converted to Torqueedo electric propulsion
- Excursion trips with 10-12 people



Portfolio of Commercial Customers

Lonestar Riverboat in Austin, TX

- On Ladybird Lake
- 175 passenger
- Twin Deep Blue motors



Portfolio of Commercial Customers: Riverbarges



Electric propulsion in the 5-20 hp power class

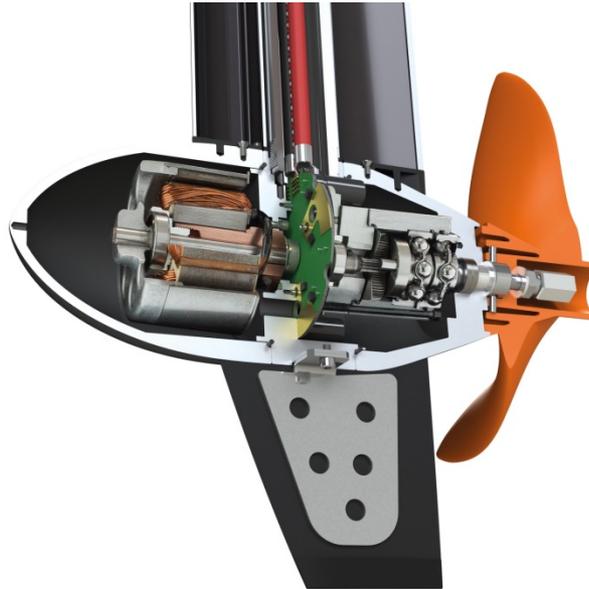
Our successful **Cruise Model Line and Lithium Batteries** are a perfect fit for river barges and water taxis



All Electric Propulsion Systems are **not** created equal

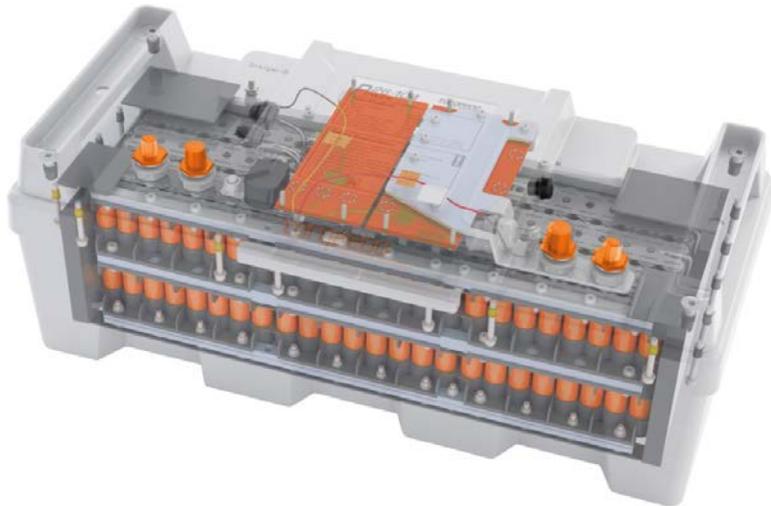
Purpose designed & built

- **Clean** slate design
- **Not an adaptation** of an existing gasoline outboard
- **True** Marine battery
- **Accurate** technical specs



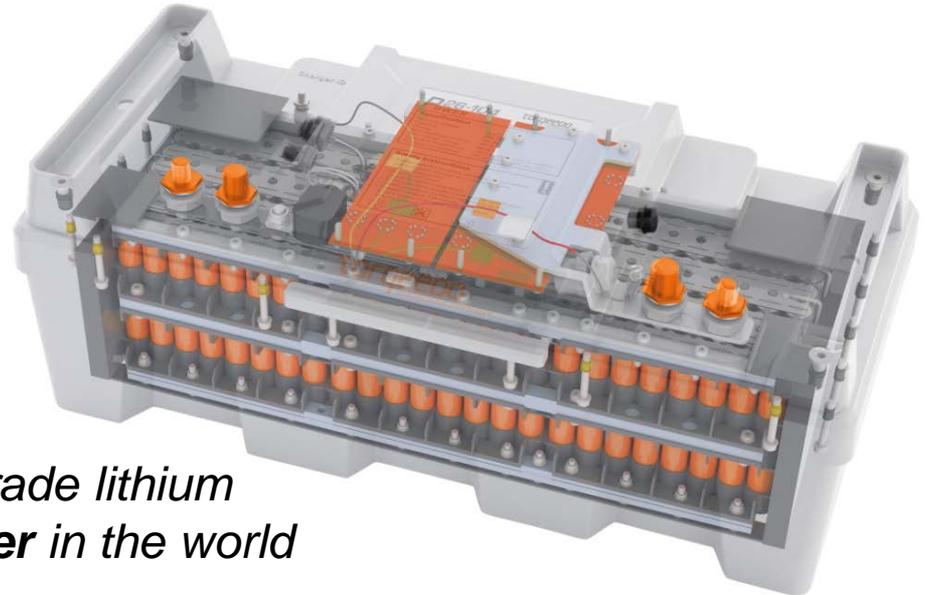
Superior power train engineering

- **ISO 9000** development environment
- **CE Certification** means our products have passed rigorous testing procedures, and are insurable
- Latest **brushless motor** with state-of-the-art electronic commutation
- **Most efficient** propellers
- Complete and **total system design**
- All components are **IP67 waterproof**
- **High performance** and safe lithium battery chemistries



Lithium Batteries are safe and reliable if they are:

- **Manufactured in a top-tier cell fabrication plant**
 - we only use Panasonic and Sony 'Cylindrical Safety Cells' from Japan
 - and Johnson Controls cells from the US
- **Are properly packaged in a true marine case**
 - IP67 waterproof and structurally robust
- **Have an effective BMS (Battery Management System)**
 - preventing over charging, over discharging, and other electrical conditions
- **Conservatively charged and discharged**
 - less heat generated
- **Proper over-current protection**

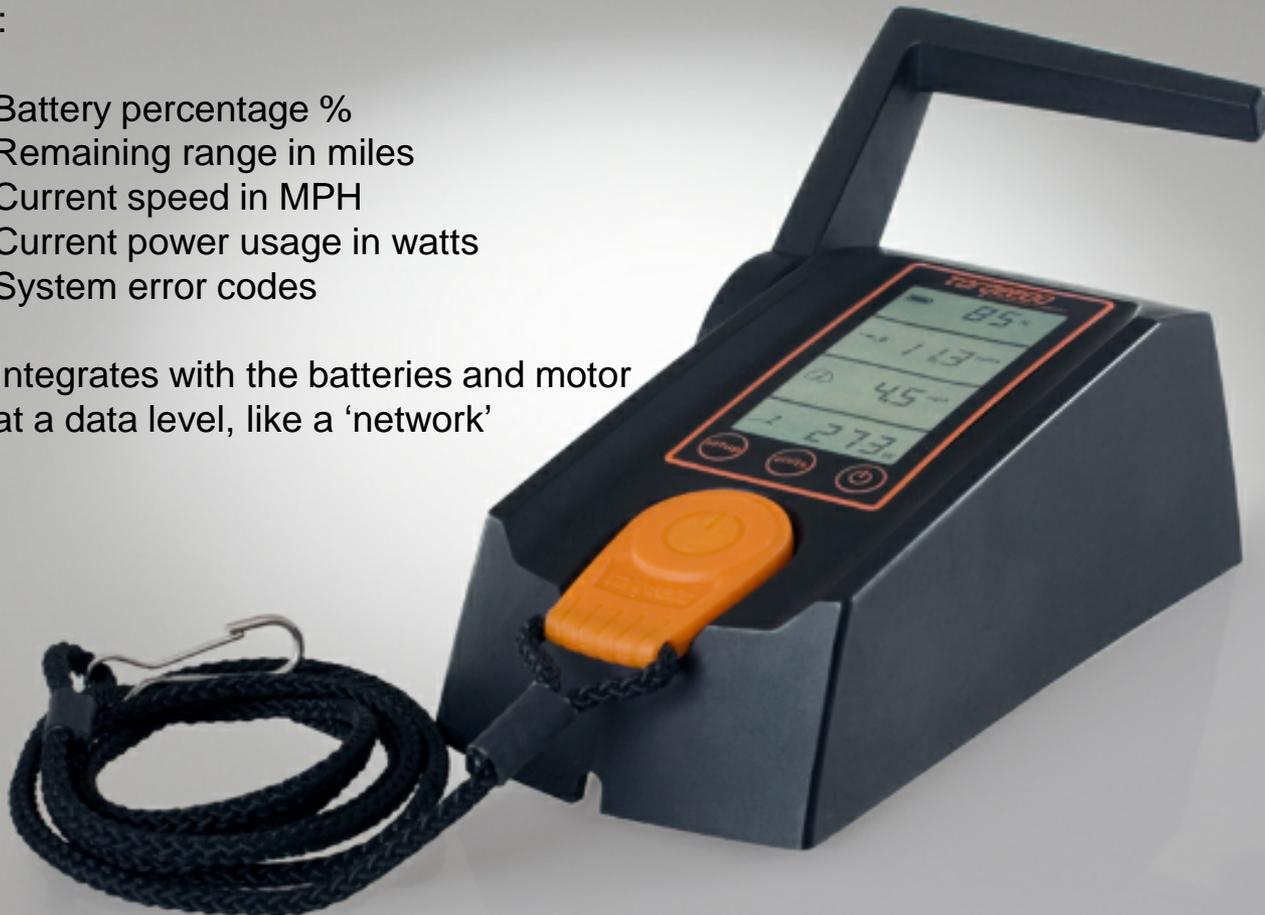


*Torqeedo has shipped more marine-grade lithium batteries **than any other manufacturer in the world***

Easy to use 'Smart Throttle'

Information Display integrated into throttle, showing:

- Battery percentage %
 - Remaining range in miles
 - Current speed in MPH
 - Current power usage in watts
 - System error codes
-
- Integrates with the batteries and motor at a data level, like a 'network'



Easy to use automatic battery chargers

- **230volt/50amp single phase service per boat will be required**
 - Actual service is 208v/50amp in the SA Marinas
- **Standard recovery times**
 - 5% left to 95% full will be about 5 hours
- **'Full cycling' is not required, as there is no 'memory effect'**
- **Charging is an automatic process and only requires the operator to plug the boat in to shorepower**
- **We recommend that the chargers be permanently installed on-board the vessel, and that the cord set remain in the marina**



System as designed for new SA Riverbarges

(16) POWER 26-104 batteries

- 2.7kWh each; 43.2kWh total bank
- LiNMC safety cells



(6) Chargers

- 1.7kW each
- 10.2kW total

Single Cruise 10kW Outboard

- Limited to 6.5kW power
- 10-12hp equivalent



Smart Throttle

- showing speed
- battery %
- Remaining range
- Error codes



Training program for Operator (or other designated party) to become a factory-authorized service center

- Will perform repairs quickly, directly, and locally at the marina
- Locally stock spare parts and replacement units, avoiding shipping cost and delays
- A Torqueedo Cruise motor can be swapped out in about 30 minutes on the water

Extended hours phone support available as a premium service

Driver coaching for a smooth transition to the electric helm

- Electric boats drive a little differently than gas powered boats
- The additional torque can be used to maneuver more accurately
- Skippers will know how to properly operate and can get the most benefit out of the system

