

# Hydrofoil Testing in Wave Tank Load Cell

Industry: Automotive and Vehicle

## Summary

### Customer Challenge

Hydrofoil design is a delicate balance between performance and complexity. Finding the right shape without using overly complex angles to achieve the desired amount of lift is crucial when designing a successful hydrofoil. Once an engineer's concepts are ready for testing, using the best force measurement equipment is required to sense the subtle differences between hydrofoil designs.

### Interface Solution

Lift and drag are the most important characteristics of a hydrofoil. The 3A120 3-Axis Force Load Cell is needed to read these forces. The Fz senses lift and the Fx and Fy sense the drag. Using the BSC4D-USB bridge amplifier increases the visibility of the load cells output signals.

### Results

When using the load cell and bridge amplifier, the engineers are able to record the real world lift and drag forces the hydrofoils apply to on the water craft. This data allows a more in-depth comparison of proposed hydrofoil designs to find the best model for the job.

## Materials

- 3A120 3-Axis Force Load Cell
- BSC4D-USB Multi-Channel, which includes BlueDAQ display, graphing, and logging software and PC Interface Module

## How It Works

1. The 3A120 3-Axis Force Load Cell is fixed to the hull of the water craft.
2. The BSC4D-USB is connected to the load cell.
3. The hydrofoil boom is attached to the 3-Axis Force Load Cell.
4. The 3-Axis Force Load Cell and bridge amplifier are protected in a waterproof housing.
5. The water craft is placed in a wave tank or current simulator.
6. The 3-Axis Force Load Cell naturally reacts to the lift and drag loads of the hydrofoil.
7. The data is logged and stored via the BSC4D-USB on a PC laptop.

