

# Portable Data Collection System Profiles the Ocean

The system, developed by The Oceanscience Group with help from Ogura, aids scientists in understanding the world's waters and its changing climates.

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Ogura's MD series of clutches and brakes insures accurate research quality data collection.

**W**hen The Oceanscience Group was designing a portable ocean data collection system to provide cost-effective, accurate ocean profiles of temperature and salinity from moving boats and ships, which is important to scientists to understand the world's waters and the changing climate, they turned to Ogura for help.

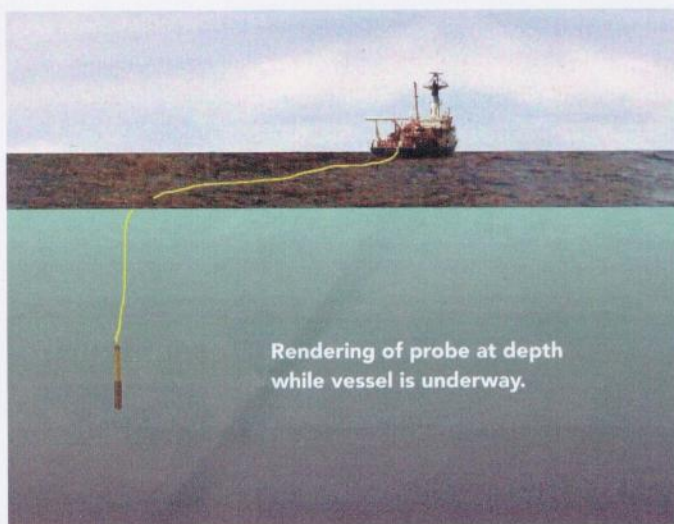
The goal was to make a compact and lightweight deployment system for a reusable instrument probe to replace current designs in the marketplace that use expensive, disposable probes, and leave debris scattered on the sea floor.

In order for the probe to profile without being dragged by the ship, the downward motion of the probe needs to be decoupled from the horizontal ship motion. This is achieved by using two payout spools simultaneously. One spool is paying out line from the underway vessel, while the other is attached to the probe and line unwinds from it as the probe descends vertically through the water column. The maximum profile depth is determined by the amount of line pre-wound onto the spool attached to the probe. As soon as all line has unwound from its tail spool, the payout of line from the shipboard winch spool is stopped and the probe is reeled back in.

Making a precisely wound probe is easy to do in the lab or in an industrial environment, but for the machine to be a success in a rugged field environment, the probe needed to be rewound many times during the same voyage. This meant designing a payout spool and rewind mechanism that could repeatedly and accurately rewind the probe after it was returned from the sea in some of the harshest and unpredictable environments.

Imagine a simple fishing reel and its setting for drag and controlled payout. This simplistic idea is what Oceanscience needed to create, but it needed to be much more controllable and robust. To start, the device needed two strong electric motor drives, one to retrieve the heavy probe against strong ocean currents and one for a tail probe rewind system, as well as an adjustable clutch to disengage the motor from the drive to let the probe take the line as it deployed. Most electric clutches could do the job, but Ogura was tasked with the following additional requirements:

- 25 NM of torque in less than 93mm in diameter (to meet the system's weight and size requirement).
- Low drag torque when disengaged (to prevent overheating)



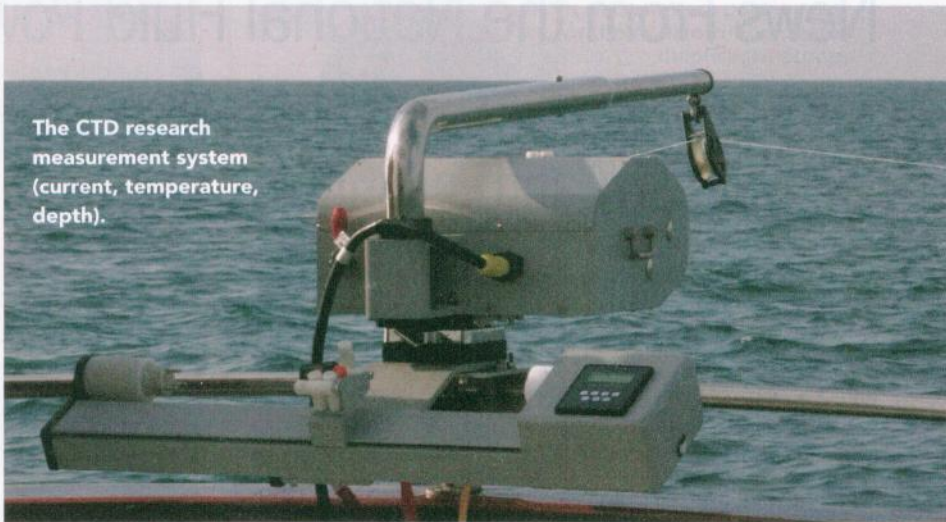
Rendering of probe at depth while vessel is underway.



and drag during deployment).

- Robust design for repeated shipboard use.
- 24V DC on-off operation, but with the ability to have a smooth adjustable current controlled clutch torque option to help with the smooth rewinding of the tail probe from the main spool.

The small size, light weight, and smooth DC current to torque features offered by Ogura's MDC 2.5 proved to be the main selling points for The Oceanscience Group. Using multiple discs of a robust proprietary friction material, the MDC clutch epoxy-filled field assembly is heat- and vibration-resistant. These features make the MDC series capable of many thousands of engagements at full load and capable of repeated low torque rewinding operations of the instrument probe and tail for Oceanscience. These features are especially important because if any components fail during use it could potentially cause the line to snap and thousands of



The CTD research measurement system (current, temperature, depth).

dollars of equipment would be lost at sea.

Proper tension of the Spectra line during winding is critical for line life and insures tangle-free unwinding during use. The rewinder function is fully programmable for different profile depths and quick turnaround.

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*For more information, go to [www.ogura-clutch.com](http://www.ogura-clutch.com) and [www.oceanscience.com](http://www.oceanscience.com).*