

Daggerboard Position Sensor

Daggerboard position plays a critical role in performance of both multi-hull and canting-keel mono-hull yachts. Until now, no instrumentation system has been able to accurately and reliably determine board position.

The Daggerboard Position Sensor is a completely non-intrusive system that uses radio frequency techniques to “see” daggerboard position. It is not dependent on magnetic or optical techniques and requires no string pots or other mechanical connections to the boards.



The system “sees” through the carbon/epoxy trunk, air/water gap and board skin and, about 5 times per second, reads tags embedded in the board.

From these, it generates board position information suitable for display on cockpit instrumentation systems and/or logging.

The system also generates a signal indicating whether the board’s position is “safe” or “dangerous”. This signal can be interfaced to a

canting keel controller to prevent moving the keel when doing so might cause the keel bulb to hit a daggerboard. This helps to prevent canting mechanism damage, board breakage and dings that increase drag and reduce speed.

[Learning your daggerboard profiles](#)

Because the geometry of each boat is unique, the specifics of the board, its tags and the trunk cannot be known in advance. Instead, the reader is “taught” about each board/trunk combination when the system is commissioned.

To accomplish this, each board is positioned in its trunk, and, while running the supplied PC-based software and following some simple steps, the system “learns” the board’s geometry.

Once “learned”, the board’s profile data is stored in non-volatile memory. Five such profiles can be stored in each Sensor at one time so no downtime is required when swapping out a damaged board.

[System components](#)

The system is comprised of three components: the tags in the board, an antenna mounted on the trunk and a reader module. One reader/antenna pair is required for each daggerboard trunk.

The standard system comes with two readers, two antenna and 100 tags, usually enough for two boards.

We supply all necessary connectors and a USB adaptor used for

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“learning”. Wire for power and data connections and mounting hardware are not included.

[About the tags](#)

The heart of the system is the tiny indicator tags buried in the lay up of the boards. The tags are approximately 24mm in length, 4mm in diameter and weigh about 0.6g each. They can be held in place by structural foam or epoxied into honeycomb or other internal structure of the daggerboard and covered with fiberglass, Kevlar or carbon skins.



While the tags are most easily installed as boards are built, they can be retrofitted into existing boards by drilling and gluing the tags in place with epoxy filler. We recommend a pitch of 100mm.

The tags are waterproof and shockproof and can withstand temperatures of up to 125° C for 100 hours - more than enough to tolerate post curing.

[About the antenna](#)

The antenna, measuring about 170 x 65mm and less than 10mm thick, can read tags from a distance of about 100mm through carbon, water and air.

In most installations, the antenna is mounted inside the boat, adhered to the trunk skin, no thru-holes are necessary.

[About the reader module](#)

The microprocessor-based reader is responsible for real-time detection. It generates two different outputs. The

first is via NMEA® 0183 and reports board position as a percentage of maximum depth. The second is an open-collector signal that indicates whether the board position is safe or dangerous. This second interface is intended for use as an interlock with the boat’s keel controller.

[Support & Warranty](#)

Kinetic Scientific is completely committed to your racing success. We offer support options via phone, e-mail and on-site during your build, installation, commissioning, trials and racing.

The system comes with a 90-day warranty.

[Contact Us](#)

If you’d like further information about the Daggerboard Position Sensor, please contact us via e-mail at

info@kineticsscintific.com

[Specifications*](#)

Supply Voltage:	8-50 VDC
Power Dissipation:	Less than 2 W per reader
Data Interface:	Electrical: EIA-422-A Protocol: NMEA 0183
Canting Interface:	Open collector
	V _{Output High} : 30 V Max I _{Output Low} : 1 Amp Max
Tags:	24 x 4mm Recommended pitch: 100mm
Weight:	Reader + Antenna: Approx 350g
Environmental:	Reader: IP65 Antenna: IP68 Tags: Hermetically sealed
Thermal Limits	Operating: 0 to 50°C Storage: -40 to 85°C

* Specifications subject to change without notice

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