

# Kinetic Scientific

High Performance Solutions for High Performance Sailing

## Kinetic Keel Controller

Kinetic Scientific's Keel Controller is a full-custom, micro-processor based solution tailored to the problem of managing canting keels on offshore ocean racing sailboats.

And, unlike PLC-based controllers that require extensive, expensive programming for even the smallest change, most adjustments to the timing, algorithms and policies of the Kinetic Keel Controller may be made offshore, by the crew, while racing.

Full integration with Kinetic Scientific's Daggerboard Position Sensor gives our Keel Controller the ability to prevent collisions between keel and boards.

Designed after extensive consultation with IMOCA 60 and Volvo 70 skippers our Controllers are compact, light-weight, low-power, high-reliability systems that provide the ultimate in high-performance keel control.

### Interfaces

The Kinetic Keel Controller provides 45 separate interfaces used to sense and control the various components of the system. These include

- 16 digital inputs
- 16 high-current outputs
- 4 analog inputs
- 4 EIA-422/NMEA 0183 inputs
- 4 EIA-422/NMEA 0183 outputs
- 1 DC motor controller

Based on these capabilities, we offer two standard configurations that cover most requirements: the KC60 and KC70. For situations where neither is appropriate, a customized implementation tailored to the specific needs of your yacht is available.

### The KC60 Controller

Our KC60 Keel Controller is intended for yachts with a single, DC-powered hydraulic pump and one hydraulic ram. It is ideal for IMOCA 60s. The KC60 interfaces include:

- Power supply
- Hydraulic direction & release
- DC pump contactor
- Ram position sense
- Hydraulic pressure sense
- Cockpit control panels (x 2)
- Daggerboard interface
- NMEA<sup>®</sup> 0183 instrument interface

### The KC70 Controller

The KC70 is designed for Volvo 70s and maxi yachts having an engine-driven hydraulic pump, a DC pump and dual hydraulic rams. In addition to providing complete canting keel control, it also manages auxiliary engine throttle and the operation of other auxiliary engine loads such as alternators. The KC70 interfaces include:

- Power supply
- Hydraulic speed & direction
- Port ram control & position feedback
- Stbd ram control & position feedback
- DC pump control
- Engine throttle & alternator control
- Cockpit control panels
- Below deck control panel
- Daggerboard interface
- NMEA 0183 instrument interface

### Semi custom solutions

Because the particulars of every canting keel installation vary widely - from the geometry of the mechanism to the details of the hydraulic power and control systems, some degree of customization is usually required. In

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most cases, the requirements of your yacht can be met at our standard price. For most others, we can accommodate your system requirements for a small incremental cost.

## [Configurable](#)

Need to allow another 30 seconds of engine warm-up time during a Southern Ocean leg? Want to change the throttle delay after canting? These and dozens more parameters are easily viewed and modified on-board, under-way using the supplied Control Panel software, which runs on a Windows-based PC.

## [Reliability](#)

While no keel controller is going to win a race, a system failure can easily put you out of the running. To help prevent failures, Kinetic Scientific's Keel Controllers all feature 100% solid-state switching, NEMA 4x enclosures and IP-67 connectors. All high-current outputs have built-in protection against open circuits, short circuits, transient voltage spikes and over temperature conditions.

A comprehensive power-on self test and on-going health checks protect the system from faults. Status indicators provide detailed information about operation and failures should they occur.

## [Design support from start to finish](#)

To get the best results, system design needs to be holistic. We're happy to work with the designers of your rams, hydraulics, power plant and instrumentation systems to make sure you get a complete solution that give you the features and performance you want combined with the reliability you need.

## [Support & Warranty](#)

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

The Keel Controller comes with a 90-day warranty.

## [Contact Us](#)

For more information about the Kinetic Keel Controller contact us at [info@kineticsscific.com](mailto:info@kineticsscific.com)

## [Specifications\\*](#)

Supply Voltage:	8-60 V DC
High power outputs:	
	V <sub>OH</sub> : 6-30 V DC
	V <sub>OL</sub> : Hi-Z
	I <sub>OH</sub> : 5.0 A Max, 9.0A Transient
	All outputs include transient surge protection and clamping diodes.
Analog inputs:	Configurable to support 0-20mA, 4-20mA and 0-3.3, 5 or 10 V DC
Digital inputs:	V <sub>IH</sub> : 3.3 VDC via 10K $\Omega$ pull up
	V <sub>IL</sub> : < 0.8 V DC
	I <sub>IL</sub> : < 0.5 mA
	Schmitt-trigger hysteresis
Serial Interfaces:	EIA-422/NMEA 0183 compliant
	Optically isolated inputs
Motor Control:	6-36 V DC, 1 A Max
Power Dissipation:	Typical 2.5 W
	Worst case 5.0 W
Weight:	Less than 1.2Kg
Dimensions:	250 x 160 x 90mm
Protection:	Enclosure: NEMA 4x
	Connectors: IP67
	Fuse holders: IP68
Thermal:	Operating 0 to 50°C
	Storage -40 to 100°C

\* All specifications are subject to change without notice

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NMEA is a registered trademark of the National Marine Electronics Association