



(Visual Sail Position And Rig Shape)

## **VSPARS RealTime with Wireless Hardware Pack**

### **System Overview:**

VSPARS is a sail shape recognition system for all boats. The VSPARS Wireless hardware pack uses a miniature battery-powered PC to control GoPro cameras to capture sail shape and rig deflection automatically. The cameras are mounted on the deck of the boat and are set to take pictures at user defined intervals (eg. every 5s). The hardware controls the cameras, acquires images and runs the VSPARS RealTime software to find the coloured sail stripes. By knowing information about the camera location and orientation, and the length and height of each stripe, the software calculates the true stripe shape and location in 3D space. In addition, the deflection of the stripe luff or rig patch from the “unloaded” condition is calculated, which allows the mast bend and sag and the forestay sag to be determined.

### **Hardware:**

The VSPARS Wireless hardware pack is pre-configured, fully plug-and-play, and comes with everything you need.

Three customised GoPro Hero 3+ cameras are provided, with deck mounts and spray guards. These cameras are pre-configured to communicate wirelessly to the on-deck waterproof control box. The camera mounts are connected to base plates which are attached to the deck by the user. VSPARS recommends using 3M Dual-Lock or Sikaflex.

A miniature computer in the box controls the cameras and runs VSPARS. A wireless router allows boat data to be fed to VSPARS for performance variable logging, and for the computer to be configured remotely. Sail stripe outputs are sent wirelessly in UDP format, which can be picked up and displayed in a number of methods on deck. A VSPARS app for Windows phones can be used to access additional triggering functions.



Both wide and narrow angle lens distortion calibrations for these cameras are supplied with the system, allowing for capture of both offwind and upwind sails respectively.

The control box features an external switch and charging socket. A low voltage alarm sounds when the internal batteries run low. The entire system runs for over 4hrs on a single charge. The range of camera reception from the control box is up to 10m.

### ***Installation:***

Installation is as simple as mounting the cameras and Wireless Receiver on the deck and measuring the position of the cameras away from the base of the mast and their angle to the centreline. All steps are detailed in the user manual. Once the cameras are mounted, it is easy for an untrained operator to process and output sail shapes following the user manual. Alternatively, one of the VSPARS team can install the system and demonstrate its use.

### ***Software overview:***

The hardware runs the VSPARS RealTime software. See separate sheet for more details.

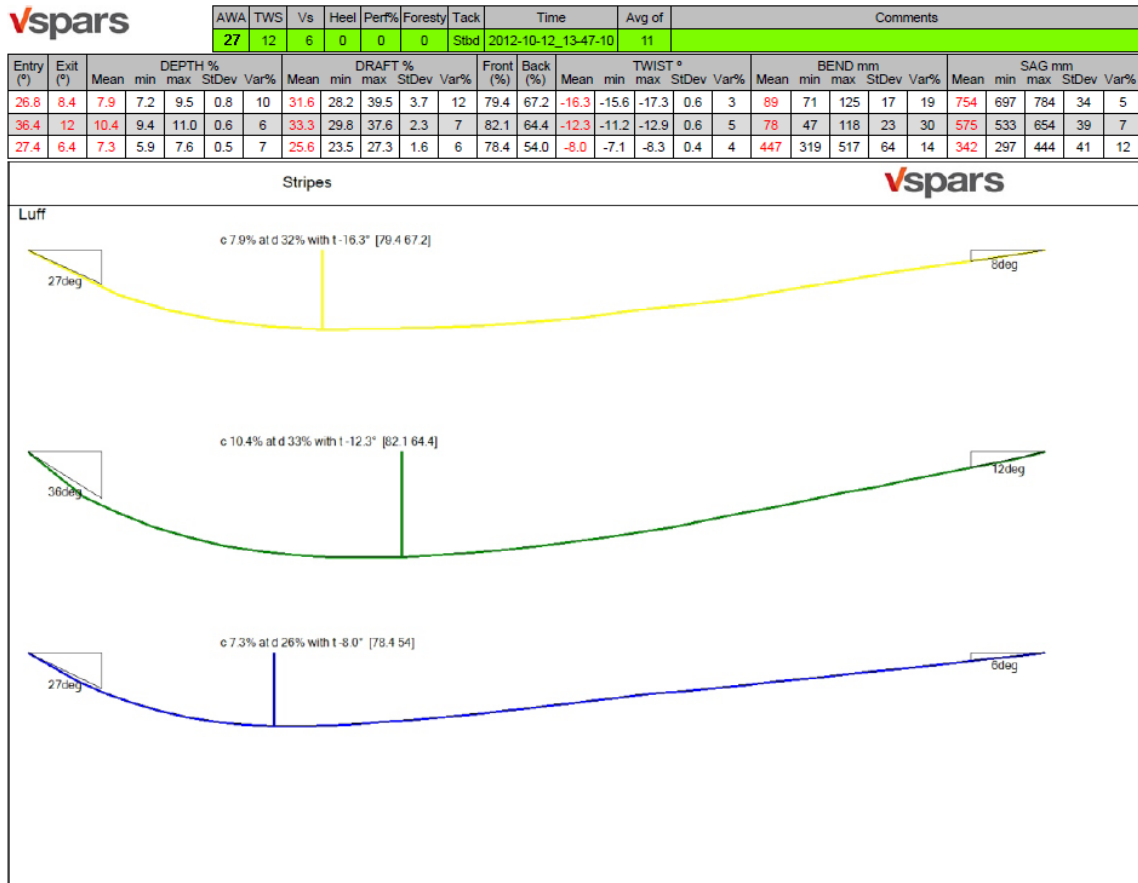
The software automatically tracks fluorescent stripes on the sails. Stripe finding can be manually adjusted if required. It is possible to link the pictures with onboard databases (such as Cosworth Pi, Expedition, OnboardAssistant, Deckman, Bravo, etc.) to store performance variables (eg. boat speed, TWS, AWS, etc) with each sail picture / results set.

A powerful filtering database is used for post-processing, averaging data runs, creating sail targets and exporting analysis data. PDF and JPG outputs make debriefs quick and effective.



Outputs include:

- stripe camber, draft, entry, exit, twist relative to CL – output to file and displayed on screen
- mast & forestay deflection
- full 3D sail stripe coordinates (X, Y, Z) suitable for IGES file creation
- standardised PDF reports of multiple sail comparisons and dynamic variations



### Hardware features:

- fully wireless, waterproof
- Over 4hrs of battery life on a single charge
- suits short-term installations
- all hardware supplied
- integration with boat data
- runs VSPARS RealTime software
- wireless output to a range of PDAs, displays, etc.